

PREFERED HABITAT THEORY

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1. Introduction

Preferred Habitat Theory is a theory on the investing behavior of bond buyers. It states that individual investors have a preferred range of bond maturity lengths, and will only go outside of this range if a higher yield is promised. This theory also states that investors prefer shorter-term bonds to longer-term bonds. The preferred Habitat Theory is the modern interest theory explaining the yield curve. It was developed in the post Nixon era to meet the difficulties arising in the fiat currency systems.

Modigliani and Sutch were primarily concerned with an empirical investigation of the effects of a particular policy of the US government and Federal Reserve, “Operation Twist”, which aimed at “twisting” the yield curve by raising the yield of bonds with short term to maturity and lowering simultaneously long-term rates. It was believed that this policy would help to reduce the balance of payments of the US. In order to give a rationale for the linear model they estimated, they reviewed the existing theories of the term structure, mainly the Expectations and the Liquidity Premium Hypothesis, and they developed their own theory, which has become known under the name of “Preferred Habitat Theory”.(Riedel, 2000)

2. FOUNDATION OF PREFERRED HABITAT THEORY

In the mid 1960s, Modiglian and Stuch advanced the theory of preferred habitat, which says that investors prefer certain investment frames. Companies that wish to issue securities whose time frame is considered undesirable will thus have to pay a premium to attract investors. Proponents of preferred habitat theory say that the latter conclusion could be accepted if all investors intend to liquidate their investment at the shortest possible date while all borrowers are anxious to borrow long. This assumption can be rejected since institutions have holding periods dictated by the nature of their liabilities.

The preferred habitat theory asserts that if there is an imbalance between the supply and demand for funds within a given maturity range, investors and borrowers will not be reluctant to shift their investing and financing activities out of their preferred maturity sector to take advantage of any imbalance. However, to do so, investors must be induced by a yield premium in order to accept the risks associated with shifting funds out of their preferred sector by a sufficient cost savings to compensate for the corresponding funding risk. Thus, this theory proposes that the shape of the yield curve is determined by both expectations of future interest rates and a risk premium, positive or negative, to induce market participants to shift out of their preferred habitat. Clearly, according to this theory, yield curves sloping up, down, or flat are all possible. (Fabozzi, 2007)

The Preferred Habitat theory also proposes that forward rates represent expected future spot rates plus a premium, but it does not support the view that this premium is directly related to maturity. The supply or demand imbalance for funds in a given maturity range will induce lenders and borrowers to shift from their preferred habitats (maturity ranges) to one that has the opposite imbalance given a compensating incentive. For example, borrowers require cost savings (lower yields) and lenders require a yield premium (higher yield). Preferred Habitat theory does not relate the premium included in forward rates to maturity. For this reason, it is used to explain almost any yield curve shape

In the Preferred Habitat Theory, the premium is a positive or a negative risk premium related to supply and demand for funds at various maturities, not necessarily a liquidity premium. The risk premium is not necessarily related to maturity.

Preferred habitat theory is different from the liquidity preference theory in that it disputes that the least premium must rise for securities with longer terms to maturity. It accepts that the assertion that the term structure of interest rates is based on short-term interest rates expected to prevail in the future, plus a non-uniform risk premium. Thus, this theory asserts that investors have preferred sectors or habitats in which they invest but are willing to shift to other maturities if compensated for the appropriate risk premium. (Rattiner, 2009).

The Preferred habitat Theory suggests that the relative riskiness of a bond is in part determined by the investment horizons of the investor who hold bonds. For example, an investor who has a known liability due in 5 years will treat a 5-year zero-coupon bond as less risky than a shorter or longer term bond. This theory predicts that an investor with an investment horizon will demand a higher yield on bonds that mature before or after the desired time.

The preferred habitat view is supported by numerous market episodes. One example is the 2000-2002 buyback programs by the US Treasury. In January 2000, the Treasury announced its intention to buy back long-term bonds through a series of reverse actions. Within three weeks of this announcement, yields on thirty-year bonds had dropped by 58bps (hundredths of one percent), a price increase larger than ten percent. Moreover, the effect was confined to long maturities: yields on five-year bonds dropped by only 9bps, while yields on two-year bonds rose by 9bps. These effects are hard to rationalize within a representative-agent model: one would

have to argue that the buyback program signaled a significant drop in aggregate consumption in thirty years. On the other hand, the effects are consistent with the preferred-habitat view since the buyback program was a supply shock local to long maturities. (Vayanos, 2007).

The preferred habitat theory is an expansion on the expectations theory which suggests that long-term yields are an estimate of the future expected short-term yields. The reasoning behind the expectations theory is that bond investors only care about yield and are willing to buy bonds of any maturity, which in theory would mean a flat term structure unless expectations are for rising rates. The preferred habitat theory expands on the expectations theory by saying that bond investor's care about both maturity and return. It suggests that short-term yields will almost always be lower than long-term yields due to an added premium needed to entice bond investors to purchase not only longer term bonds, but bonds outside of their maturity preference.

The theory further explains that, if short-term rates are a lot lower than long-term rates, then bond issuers will issue more short-term bonds to take advantage of the lower rates, even though they would prefer longer maturities to match their expected income streams. Likewise, lenders will tend to buy long-term debt if the yield advantage is significant, even though carrying long-term debt has increased risks. Here the theory is an extension of market segmentation theory..

The preferred habitat theory also adopts the view that the term structure reflects the expectations of future path of interest rates as well as a risk premium. However, the preferred habitat theory rejects the assertion that the risk premium must rise uniformly with maturity. This theory asserts that to the extent that the demand and supply of funds in a given maturity range do not match, some lenders and borrowers will be induced to shift to maturities showing the opposite imbalances. However, they will need to be compensated by an appropriate risk premium whose magnitude will reflect the extent of aversion to either price or reinvestment risk. Thus, this theory proposes that the shape of yield curve is determined by both expectations of future interest rates and a risk premium, positive or negative, to induce market participants to shift out of their preferred habitat. Thus, according to this theory, yield curves sloping up, down, flat, or humped are all possible. (Leonardo, 2010).

Under this theory, the yield curve normally, has a natural upward slope due to the term premiums; also, since long-term rates are, in part an average of short-term rates, the yield curve will tend to shift rather than twist. If the yield curve slopes slightly upwards, investors expect interest rates to stay about the same. If the yield curve slopes sharply upward, short-term rates are expected to rise. If the yield curve slopes flat, short-term rates are expected to fall slightly.(Latzko.2007).

The liquidity preference theory assumes that risk premium must necessarily rise with maturity because investors wish to liquidate their investments at the earliest and borrowers want to borrow for long. This assumption however may not be realistic.

According to Modigliani and Sutch who originally formulated the Preferred Habitat Theory, risk-aversion implies that investors will prefer to match the maturity of investment to their investment

objective. Investors with long investment horizons would like to invest in instruments of longer maturities; otherwise they will be exposed to a reinvestment risk, i.e. the risk at the interest rate will decline when the proceeds of a short-term instrument have to be reinvested. Likewise, the short-term investors would like to invest in instruments of shorter maturity; otherwise they will be exposed to a price risk, i.e. the risk that the price of an asset will fall when it is sold prematurely because of a rise in the interest rates. Similar considerations apply to borrowers. Risk aversion implies that borrowers would like to match the maturity of their borrowings to the length of time for which they need funds.

If there is a mismatch between the demand and supply of funds in a certain maturity range, the preferred habitat theory asserts that lenders and borrowers may have to be induced to shift out of their preferred maturity ranges. Of course, they will have to be compensated for this in the form of suitable risk premium which depends on the extent of risk aversion. (Prasanna, 2011)

3. Assumptions of Preferred Habitat Theory

- 1) Investors and borrowers have segments of the market in which they prefer to operate.
- 2) When significant differences in yield exist between market segments, investors are willing to leave their desired maturity segment.
- 3) Yield differences determined by the supply and demand conditions within the segment.

4. Conclusions of Preferred Habitat Theory

The major conclusions of the preferred theory are as follows:

- 1) If the yield curve slopes upwards, investors do not expect any major changes in interest rates. Rates may go higher, but they may also remain the same, with the upward slope reflecting the risk premium. In other words, the prevailing conditions are expected to continue (provided the economy is growing).
- 2) If the yield curve is sloping downward, short interest rates are expected to fall. Since at higher maturities we would expect interest rates to be higher, but get them lower in a downward slope, the only possible conclusion is that rates will fall so much that they will be lower than today's interest rates even with the risk premium added.
- 3) If the yield curve is flat, the market is expecting future rates to come down slightly. Interest rates must fall in the future, so that the yield curve may remain flat even with the risk premium added on top of future prices.

5. The Current Developments in The Preferred Habitat Theory

The preferred-habitat literature recently was revitalized in the seminar work of Vayanos and Vila in 2009, who recast Treasury supply and demand shocks in an arbitrage-free framework. According to their model, the existence of preferred-habitat investors provides a channel for demand and supply factors to influence Treasury yields, while the existence of risk-averse arbitrageurs, who have no maturity preference but actively trade to take advantage of arbitrage opportunities, ensures that supply shocks are transmitted smoothly across the yield curve. Under

certain parameterizations, the yield impact of variations in relative supplies depends on the dollar duration of the supply shocks absorbed by the arbitrageurs, which implies a direct relationship between the term premium and the total duration risks faced by private investors. (Vayanos, D. and Vila, L, 2009)

The preferred-habit literature, which features early contributions by Modigliani and Sutch (1966,1967), resorts to the assumption that there exist "preferred-habitat" investors, who demonstrate preferences for specific maturities, and that interest rate for a given maturity is only influenced by demand and supply shocks specific to that maturity. Real-world examples of such preferred-habitat investors include long-term investors, such as pension funds and insurance companies, that prefer to hold long-term bonds to match their long-duration liabilities, and short-term investors, such as money market mutual funds and foreign reserve managers, that prefer to hold Treasury bills and short-dated notes to maintain a high degree of liquidity in their portfolio. The preferred-habitat approach provides a rationale for supply effects in the government bond markets, as a shock to the stock of privately-held bonds of a particular maturity creates a shortage of those assets that cannot be wholly relieved, at existing asset prices, by substitution into other securities. (Li, C. and Wei, M., 2014).

REFERENCES

- Barberis, N. and Shleifer, A. (2003). Style Investing. *Journal of Financial Economics* 68, 161-199.
- Bates, D. (2006), The Market for Crash Risk, working paper. University of Iowa.
- Buraschi, A. and Jiltsov A., (2007). Term Structure of Interest Rates Implications of Habit Persistence. *Journal of Finance*, forthcoming.
- Chan, K., Karolyi, G., Longsta, F. and Sanders, A. (1992). An Empirical Comparison of Alternative Models of the Short-Term Interest Rate. *Journal of Finance* 47, 1209-1227.
- Cochrane, J. (1999). New Facts in Finance. *Economic Perspectives* (Federal Reserve Bank of Chicago) 23, 36-58.
- Cox, J., Ingersoll, J. and Ross, S. (1985). A Theory of the Term Structure of Interest Rates. *Econometrica* 53, 385-408.
- Culbertson, J., (1957). The Term Structure of Interest Rates. *Quarterly Journal of Economics*, 71, 485-517.
- Fama, E. and Bliss, R. (1987). The Information in Long-Maturity Forward Rates. *American Economic Review* 77, 680-692.
- Garleanu, N., Pedersen, L. and Poteshman, A. (2006). Demand-Based Option Pricing. Working Paper 35, University of Pennsylvania.
- Graham, J. and Smart, S. (2011). *Introduction to Corporate Finance: What Companies Do: Third Edition*: South Western Cengage Learning, 405-407.
- Gromb, D. and Vayanos, D. (2002). Equilibrium and Welfare in Markets with Financially Constrained Arbitrageurs, *Journal of Financial Economics*, 66, 361-407.
- Li, C. and Wei, M., (2014). Term Structure Modeling with Supply Factors and the Federal Reserve's Large Scale Asset Purchase Programs. *Finance and Economics Discussion Series: 2012-37*

- Litterman, R. and Scheinkman, J. (1991). Common Factors Affecting Bond Returns. *Journal of Fixed Income* 1, 54-61.
- Meggison, W. and Smart, S. (2008). *Introduction to Corporate Finance*;
- Modigliani, F. and Sutch, R. (1966). Innovations in Interest-Rate Policy. *American Economic Review* 56, 178-197.
- Spiegel, M. (1998). Stock Price Volatility in a Multiple Security Overlapping Generations Model. *Review of Financial Studies* 11, 419-447.
- Vasicek, O., (1977). An Equilibrium Characterization of the Term Structure. *Journal of Financial Economics* 5, 177-188.
- Wachter, J. (2006). A Consumption-Based Model of the Term Structure of Interest Rates. *Journal of Financial Economics* 79, 365-399.
- Xiong W. and Yan, H (2006). Heterogeneous Expectations and Bond Markets. Working paper 36, Princeton University.