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ANALYSIS of THE YIELD CURVE

An extension of the observations of Menger & Fekete.

Looking back to Menger's observation of bid/offer spread as opposed to monolithic price, Fekete combined and enhanced productivity and time preference schools via *marginal* methods with *marginal* time preference and *marginal* productivity of capital.

'Space,' via marginal productivity of capital and 'time,' via marginal time preference, were united in Fekete's theory of interest. Marginal time preference is expressed via the marginal gold 'bondholder.' The marginal bondholder is the first to refuse to exchange gold coins for gold bonds in view of the (bid) rate of interest falling below *their* time preference. The time preference of the marginal bondholder is otherwise known as marginal time preference. In a similar fashion, marginal productivity of capital is expressed via the marginal 'entrepreneur.' The marginal entrepreneur is the first to refuse to exchange gold bonds for (gold-priced) capital goods in view of the offered rate of interest being above their (potential) productivity.

Marginal analysis coupled with Menger's original observations, can be extended further to determine the theoretical shape of the yield curve under an unadulterated gold standard.

There is no such thing as a monolithic yield curve: there is a yield curve bid/offer spread. Before any analysis can be attempted, we must start from the position of a flat yield curve spread and figure out whether this is likely to remain. Someone approaching the bond market as a *lender* has two immediate considerations: the maturity of the bond to be exchanged for their gold coin and the rate of interest bid for *that particular* maturity. Similarly, someone approaching the bond market as a *borrower* has two considerations: the length of time the loan is required and the rate payable for that particular time span after which the money must be returned to the lender. Since we are starting from the position of a flat yield curve spread, someone approaching the bond market as a lender only has the maturity as a variable in their mind. Similarly so for someone approaching the bond market as a borrower: as the offered rate is equal for all maturities, so the maturity will be the only factor in the determination.

At this stage the concepts of *liquidity preference* and *maturity preference* are introduced. The former concerns the lender and the latter the borrower. Liquidity preference states that all other things being equal – the lender will prefer a shorter maturity to a longer maturity. Maturity preference states that all other things being equal, the borrower will prefer a longer maturity to a shorter one.

On their own, liquidity preference and maturity preference are pretty unworkable: very rarely does such a *ceteris paribus* situation exist in reality. This is where we must turn our attention to *marginal liquidity preference* and *marginal maturity preference*.

Principle of marginal liquidity preference: the first to refuse to buy a shorter term bond in favour of a longer term bond. Consider the bid rate of interest between two different maturities under liquidity preference. The bid rate of the shorter maturity will be pushed lower until the principal of *marginal* liquidity preference is observed. The first to choose the longer term bond over the shorter term bond in view of the difference in rates is acting under the principal of marginal liquidity preference.

Principle of marginal maturity preference: the first to refuse to sell a longer term bond in favour of selling a shorter term bond. Consider the offered rate of interest between two different maturities under maturity preference. The offered rate of the longer maturity will be pushed higher until the principle of *marginal maturity preference* is observed. The first to choose the shorter term bond over the longer in view of the difference in rates is acting under the principle of marginal maturity preference.

Each and every person approaching the bond market as a lender would consider owning a longer term bond over a shorter term bond for a suitable difference in the rate. Consider a particular pair of bonds: each person considering this particular pair has a personal rate (of difference) at which they would forgo ownership of the shorter maturity in favour of the longer maturity. Ranking the differences in a descending manner, one arrives at the marginal role. Of all of those that have been unaccommodated for want of their personal difference being too wide, the first person to be accommodated occupies the marginal role.

In a similar fashion, every person approaching the bond market as a borrower would consider borrowing for a shorter maturity than a longer one for a suitable difference in the offered rate. Consider a particular pair of bonds: each borrower considering this particular pair has a personal rate of difference at which they would forgo borrowing for a longer duration in favour of a shorter one. Ranking the differences in a descending manner, one arrives similarly at the marginal role. Of all those that have been unaccommodated for want of their difference being too wide, the first person to be accommodated occupies the marginal role. It is worth emphasising that borrowing for a shorter duration cannot be considered indefinitely as it could encourage borrowing for a shorter period than might be necessary for the underlying venture.

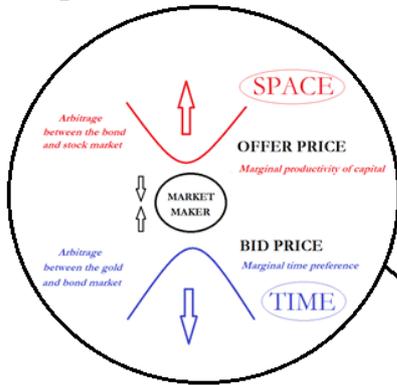
The principle of marginal liquidity/maturity preference puts a bound on the range of the yield curve spread. Marginal liquidity preference prevents the bid rate on the shorter end of the yield curve falling indefinitely. Likewise, marginal maturity preference prevents the offered rate on the longer end of the yield curve rising indefinitely. Of particular interest in the pairwise consideration of bonds is the shortest maturity with that of the longest maturity – which may be a perpetual bond. What would the difference have to be for someone to forgo ownership of the shortest term bond in favour of the longest? What would the difference have to be for someone to forgo their money present now for a perpetual stream of money?

The closer a bond is to maturity the more marketable an instrument it is. Naturally, market makers would be more willing to make a market in shorter than longer maturity bonds. Therefore, the bid/offer spread would be narrower at shorter bond maturities.

This completes the analysis of the formation of the yield curve spread. Applying the principles of marginal liquidity preference and marginal maturity preference, one arrives at a yield curve spread that would have an upward bias at both the bid and offered levels across different maturities.

The extent of the gradients being guided by marginal maturity preference for the offered rate and marginal liquidity preference for the bid rate across different maturities.

Interest rate spread



Yield Curve Spread

