FIRST DEGREE GLOBAL ASSET MANAGEMENT

Long Horizon Investing

The Theory and Empirical Underpinnings of First Degree Global Asset Management's Investment Process

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1. Introduction

This paper provides an introduction to 'long horizon' investing which is at the core of the investment process operated by First Degree Global Asset Management. Long horizon investing is best explained by reviewing the established body of theoretical and empirical work[1] that shows that risk premia are predictable at long horizons. Much of the research focuses on the US bond market since a long data history exists, however there have been extensions into the European and Asian bond markets.

A central tenet is that investor risk aversion is the primary determinant of the risk premia earned by assets. The 'financial markets cycle' (crisis, boom, crisis, boom) can be characterized by systematic time-variation in risk aversion and therefore risk premia. In this event, risk premia should be predictable with proxies for risk aversion, and exploitable for profit.

This paper is organized as follows. Section 2 presents the theoretical framework supporting our view that investor risk aversion risk is the primary determinant of the risk premium. Section 3 discusses the empirical evidence using market based observable proxies for investor risk aversion, such as yield curve slope and credit spreads. The empirical evidence suggests the following:

1. US credit and bond market predictability is strongest for annual data as compared with monthly data. See Lo and MacKinlay (1999);
2. European and Asian bond markets are constrained by short data series. However, there is good evidence to support the view that these markets also display stronger predictability with annual data as compared with monthly data. See Fisher (2012); and

[1] Much of this work was initiated in the 1980's and 1990's. See French et al (1987), Lo and MacKinlay (1999), Fisher (1992) and Cochrane's (2009) retrospective, amongst many

3. The findings are not confined to the bond markets. However, the signal-to-noise ratio in the bond markets is much higher versus, say, the equity markets. This leads us to focus our investment process on the bond markets.

The increasing strength of forecast power at longer horizons is striking. First Degree's investment process captures this empirical fact systematically by restricting ourselves to an annual rebalancing frequency. To our knowledge, no other asset manager systematically captures this empirical fact within their process.

Section 4 concludes the paper by highlighting three features of our process that distinguishes us from other managers, namely:

1. We structure our investment process around solid theory and empirical evidence;
2. Risk aversion is the key theoretical parameter driving asset returns. This is where we focus our process and research resources. Our observation is that our competitors are mostly focused on forecasting cash flow variation (GDP, corporate credit, prepayments etc), which is largely irrelevant for determining asset price variation; and
3. Investing for longer horizons leads us to annual rebalancing, less overall trading and hence lower transactions costs.

2. Equilibrium Asset Pricing and Risk Aversion

2.1 The importance of risk aversion in determining asset prices

Equilibrium asset pricing theories focus on risk averse investors choosing between consumption and portfolio investments over time. Ingersoll (1987) summarises the extensive literature. For our purposes, the important result is that, in equilibrium, the risk premium for a risky asset is given by:

Risk premium(t) = σ(t) Cov(Consumption risk(t), Risky Asset(t))
(2.1)

where σ(t) is the risk aversion coefficient. This equation says that an asset's expected risk premium is higher when either (i) risk aversion is high or (ii) the covariance of the assets price with consumption is high.

Most attention in the asset pricing literature has been paid to the second term in equation (2.1) determining the risk premium – that is, how well or poorly an asset smoothes an investor's consumption profile. Procyclical investments attract higher premia ('high consumption betas'), while countercyclical investments are bid up in price due to their natural insurance properties.

Less attention has been focused on the role of risk aversion. This is largely because investor preferences are subjective, unobservable and therefore not easily amenable to empirical analysis. This is a pity since it is well established that risk aversion dominates the consumption-covariance term in determining the risk premium. For instance, empirically we know that Cov(Consumption risk(t), Risky Asset(t)) is very small for both equities and bonds (<0.004) relative to realized return premia (0.06 for equities, 0.03 for bonds). Therefore, in order to get significant variation in asset prices, risk aversion must drive the risk premium.

To illustrate the relation between an asset's price and risk aversion, consider a zero coupon bond paying a random cash flow $\widetilde{C}$ with maturity T. The price of the bond at date t is given by the discounted expected value using martingale probabilities such that:

$$P_t = E\frac{\widetilde{C}}{\left(1 + r_t + riskpremium_t\right)^{T-t}} \tag{2.2}$$

$$riskpremium_t = \sigma_t Cov(Consumption_t, \widetilde{C}) \tag{2.3}$$

where r_t is the risk free rate. These equations highlight two effects from a temporary increase in risk aversion. First, from (2.2) there is a contemporaneous decline in the asset's price when the required risk premium rises. This is known as the 'valuation effect'. Second, future realized returns are higher due to the higher risk premium impounded into the price. This pattern, a negative valuation effect followed by a sequence of higher future returns, is suggestive of return predictability, which is the point of our paper.

In closing this section, we want to make two important points about the theory.

First, the asset pricing equilibrium relation (2.1) is a *structural* relation. This means it is a restriction generated by the exogenous economic constraints of technology and preferences. It is also a no arbitrage condition. Therefore it does not change with the economic cycle.

Second, (2.2) and (2.3) show clearly that the price of a security can vary over time due to risk aversion even though the cash flow $\widetilde{C}$ remains the same. This can explain many recently observed phenomena such as (i) why High Yield bond prices fluctuate wildly while default rates are relatively stable, (ii) why senior tranches of securitized products suffer price declines despite ample credit support and (iii) why Treasury bond prices change rapidly even though the business cycle is relatively mild.

2.2 Risk aversion proxy variables in empirical testing

Since risk aversion is not directly observable, researchers are forced to use proxy variables that they would expect to reflect changes in investor attitudes to risk. In selecting proxy variables, it is preferable to use market prices where possible since these represent forward looking expectations.[2] The two proxy variables commonly chosen are:

1. The 'term spread' or 'yield curve slope' between 10 year Treasury bonds and 3 month T-bills; and
2. The 'credit spread' between BBB rated bonds and 10year Treasuries.

The rationale for these variables is simple. When investors extend duration or go down in credit quality they are taking greater risk. Therefore, as risk aversion rises, steeper curves and larger credit spreads (lower prices) must be offered to induce increasingly risk averse investors to hold assets.

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2. In fact, we examined economic variables such as GDP growth and found neither a contemporaneous nor a predictive relation.

3. Empirical Evidence

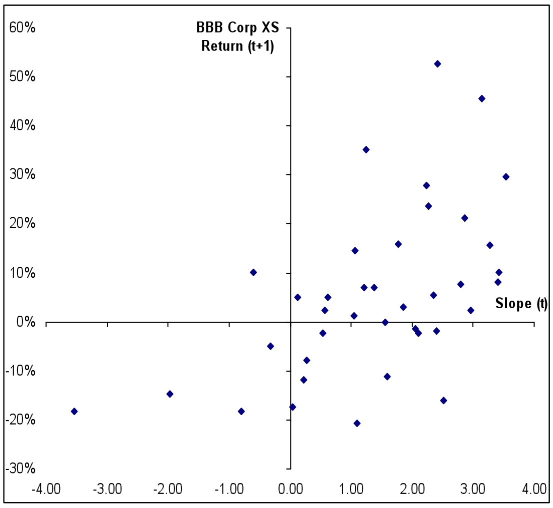
Lo and MacKinlays' original work was published in 1991, however the first empirical findings were presented in seminars and working papers during the mid-1980's. Fisher and Delomier (2009) updated the original work using data from 1934 to 2008. Their findings were the following:

1. Maturity premium predictability in the US bond market is strongest for annual data. They measured a R-square of 18.98% for predicting the 10yr-cash maturity premium using annual data versus a R-square of 1.48% with monthly data;
2. Credit risk premium predictability in the US bond market is strongest for annual data. They measured a R-square of 35.27% for predicting the 10yr BBB credit premium using annual data versus a R-square of 4.00% with monthly data; and
3. An out-of-sample trading rule calibrated on data from 1934-1969 generated Information Ratios of 0.42 and 0.59 for the maturity premium and credit premium, respectively, for the period 1971-2008. The models produced positive excess returns in 21 and 27 years respectively out of the 37 observations in the period.

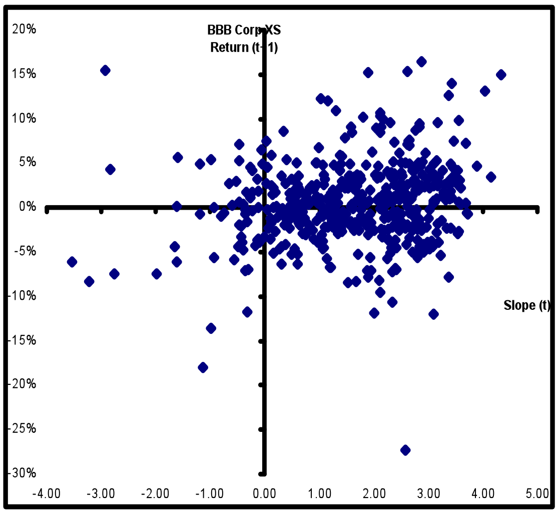
The compelling aspect of Fisher and Delomier's update is that they performed the empirical tests with an additional 20 years of data that was generated after Lo and MacKinlay's original paper. The results are confirmed with that additional data.

The following pair of diagrams illustrate the significant increase in forecast power using annual versus monthly rebalancing.

Annual rebalancing



Monthly rebalancing



The horizontal axis measures the signal as at today, while the vertical axis measures the realized excess return of a BBB rated Corporate bond in the future. The right hand diagram uses monthly data and, to the naked eye, there is no clear pattern. The annual data in the left hand diagram, alternatively, reveals a clear positive correlation between the signal today and realized excess return one year ahead. This are powerful statistics for, if you can see it, it must be true!

Fisher (2012) extended the US findings to 11 Asian bond markets. Consistent with the US evidence, he discovered that predictability using an identical framework tends to be stronger at annual horizons relative to monthly data. Predictability is generally weaker than in the US, but this is arguably due to the limited bond market history in those markets. In addition, Fisher (2012) argued that the finding is most reliable in the established Asian bond markets, such as those of Hong Kong, Japan, Korea and Singapore.[3]

[3] Similar findings have been detected for Germany and the UK in unpublished research by First Degree.

When viewed in total, the empirical evidence supports the view that bond market predictability using proxies for risk aversion increases with the investment horizon. This is a major finding, particularly if you are an active portfolio manager. As a matter of fact, the results show that the insight of a strategy based on curve slope or credit spread is concentrated at the lower frequencies or longer horizons. Investors who adopt this strategy are best advised to trade infrequently and hold positions for at least a year to maximize their chance of success.

4. Conclusion

The paper introduces the theoretical and empirical rationale underlying the long horizon investment process operated by First Degree Global Asset Management.

We close by highlighting three features of our process that distinguishes us from other managers:

1. We structure our investment process around solid theory and empirical evidence;
2. Risk aversion is the key theoretical parameter driving asset returns. This is where we focus our process and research resources. Our observation is that our competitors are mostly focused on forecasting cash flow variation (GDP, corporate credit, prepayments etc), which is largely irrelevant for determining asset price variation;
3. Investing for longer horizons means annual rebalancing, less trading and, hence, lower transactions costs.

References

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