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Prospect Theory and Asset Prices

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Abstract:
We study asset prices in an economy where investors derive direct utility not only from consumption but also from fluctuations in the value of their financial wealth. They are loss averse over these fluctuations and the degree of loss aversion depends on their prior investment performance. We find that our framework can help explain the high mean, excess volatility and predictability of stock returns, as well as their low correlation with consumption growth. The design of our model is influenced by prospect theory and by experimental evidence on how prior outcomes affect risky choice.

Executive Summary:
One of the most important topics studied by financial economists is the behavior of aggregate stock markets. Over the past two decades, a number of puzzling features of stock market movements have been identified. This paper is an attempt to resolve these puzzles.

There are three main puzzles associated with aggregate stock market behavior: (i) the equity premium puzzle; (ii) the volatility puzzle; and (iii) the predictability puzzle. We describe each one in turn.
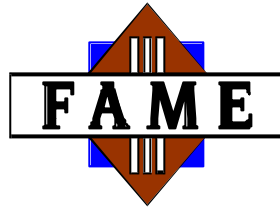
The equity premium is the average return on the overall stock market minus the return on riskless government bonds. The puzzle is that in most countries, the historical equity premium has been much higher than our economic models would predict.

The volatility puzzle is that stock market levels appear to move around too much. For example, ratios of price to earnings in the U.S. stock market have often been very high.

The standard rationalization of this is that investors must be expecting high cashflow and earnings in the future, and are therefore happy to pay high prices today. However, historical data shows that high levels of price-earnings ratios are not, on average, followed by higher earnings. In this sense, it is a puzzle why prices were so high to begin with. This is the volatility puzzle.

Historical data also shows that the price-earnings ratio can predict future returns on the stock market. High levels of the price-earnings ratio have generally led to lower subsequent returns, and low levels of the ratio to higher returns. This evidence is known as the predictability puzzle.

Our paper tries to make sense of these findings. Most traditional models assume that investors only receive utility from consumption. We depart from this framework by arguing that investors also receive direct utility from another source, namely changes in the value of their financial wealth. This second type of utility need have nothing to do with consumption. For example, if you suffer a big loss in the stock market, you may experience a sense of regret at the decision to invest in the first place; you may interpret the loss as a sign that you are a second-rate investor, dealing your ego a painful blow; and you may feel humiliation in front of friends and family when words leaks out. Whatever the reason, our model assumes that when thinking about how much to invest in the stock market, people take this additional source of utility into account.

This second source of utility has two features which are motivated by research in the psychology literature. First, investors are loss averse, which means that they are more sensitive to losses in financial wealth than to gains. Second, how loss averse they are may change over time depending on their previous investment results. If they have recently made a lot of money in the stock market, they may be less nervous, or less loss averse, because any loss they incur will be cushioned by their prior gains. However, if they have recently been burnt by painful losses in the stock market, they may be more nervous about any additional setbacks, in other words, more loss averse.

In this paper, we show that this framework may be helpful in resolving the three puzzles outlined earlier. First, we find that our model predicts large equity premia, in line with those observed in the data. The reason is that the investors in our model are loss averse: they are much more sensitive to losses than to gains, and therefore they are uncomfortable with the frequent
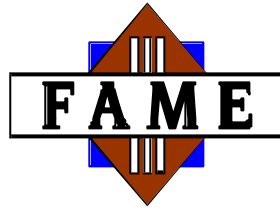
fluctuations of the stock market and demand a large average premium to compensate them for this risk.

To understand how we resolve the volatility puzzle, suppose that the stock market receives some good news about earnings. This will push the stock market up, generating substantial gains for investors. Now that they have gains, investors will be less loss averse, because these gains will cushion any subsequent losses. Since they are less risk averse than before, they are prepared to pay even more for stocks, and push stock market prices even higher. Therefore, a changing degree of loss aversion may explain why prices appear to move more than is justified by news about earnings.

The resolution of the predictability puzzle is similar. After a good piece of earnings news, the stock market goes up, generating gains for investors, who become less loss averse and push the stock market even further up. Since their prior gains make them feel more comfortable, investors demand a lower average return as compensation for staying in the stock market. Therefore, high prices are on average followed by lower returns, in line with the findings of predictability in the data.

Remarkably, very few models have been proposed that can address all three of these puzzles. Other promising models rely on other behavioral ideas such as overreaction to explain phenomena like the volatility puzzle. More testing of these models in the next few years will give us more insight into which factors are truly important for understanding aggregate stock market behavior.