Prof. Bryan Caplan
bcaplan@gmu.edu
http://www.bcaplan.com
Econ 812

Week 13: Finance and Portfolio Theory

I. Permanent Income Anomalies
   A. If you have diminishing marginal utility of consumption and access to intertemporal markets, tailoring your consumption to your *current* income makes little sense.
   B. Instead, the smart thing to do is base your consumption on your *permanent*, or expected long-run, income. This is one of the main insights that won Friedman his Nobel prize.
   C. Obviously there is a lot of truth in the PIH. Young people tend to build up a lot of debt, and pay it off as they age. Once they retire, they consume out of the assets they built up during their working years.
   D. Nevertheless, behavioral economists have assembled a long list of violations of the PIH. It does not seem to work perfectly.
   E. For one thing, consumption seems moderately sensitive to current income. Medical students go into debt, but their consumption levels predictably rise once they begin practicing. More formal statistical analysis confirms this impression: current income has a moderate ability to predict current consumption.
   F. In addition, consumption responses seem to vary with the nature of the income. Most people who get a windfall - like a one-time cash bonus - rarely use it to raise their consumption smoothly over their lifespan.
      1. Question: How do durable goods alter PIH predictions?
   G. Similarly, there is empirical evidence that people are reluctant to tap into both pensions and home equity to smooth their current income. Reverse mortgages are extremely unpopular, even for elderly people living very modesty in high-value homes.

II. Liquidity Constraints Versus Debt Aversion
   A. The standard neoclassical explanation for the partial failure of the PIH is liquidity constraints. A medical student can't borrow more than a small fraction of his future income stream; he lacks the necessary collateral.
   B. However, liquidity constraints only explain away anomalies where individuals are indeed liquidity constrained. Once people have significant home equity, liquidity constraints no longer bind. But many deviations from the PIH persist.
   C. Behavioral economists argue that there is a separate phenomenon of "debt aversion." People simply dislike being in debt, as such.
   D. Evidence? For one thing, most second mortgages are taken out for home improvements, not to smooth consumption.

E. We also see people pre-paying low home mortgage and student loans instead of investing surplus funds in the broader market.

F. Interesting: though a common theme in behavioral economics is that people are excessively impatient, the debt aversion evidence points in the opposite direction. People would be better off if they borrowed more to live better today.

III. PDV, Diversification, and Risk Premia

A. In a world of certainty, the price of every asset has to equal its PDV.

B. With risk-neutrality, this result holds under uncertainty as well. The only difference is that assets go for their *expected* PDV.

C. Once there are enough risk-averse agents, though, factors besides assets' PDVs begin to matter. In particular, we would expect assets to trade for their PDV minus some risk discount (equivalently, we would expect assets to earn a normal rate of return plus a risk premium).

D. But this is complicated by the fact that there are numerous risky assets. Basic probability tells us that the average riskiness of a bundle of different risks is less than the average riskiness of an equal dollar amount of the same risk.

E. Thus, to some degree, risk can be "diversified away." We should not expect diversifiable risk to earn a premium.

F. What you earn a premium for, then, is undiversifiable risk. Insofar as the return of an asset positively correlates with the "average market" return, you should expect a risk premium.

G. If you could actually find an asset that negatively correlates with the "average market" rate (these are hard to find!), it would actually be more valuable than a riskless asset.

II. Mean-Variance Efficiency

A. A popular simplifying assumption in finance is that people care only about the *mean* and the *variance* of their consumption. The higher than mean and the lower the variance, the higher their utility.

B. This gives rise to the idea of *mean-variance efficiency*. This basically amounts to assuming that agents select portfolios on the mean-variance budget constraint. They want the highest mean given the variance, and the lowest variance given the mean.

C. Working through these assumptions implies the following equation for the expected return of an asset:

$$\overline{R_a} = R_0 + \frac{\sigma_{ae}}{\sigma_{ee}}\left(\overline{R_e} - R_0\right)$$

D. Translation: The expected return on asset a equals the risk-free rate, plus the difference between "average market" rate of return and the risk-free rate, times the ratio of the covariance of a's return with the average market return to the variance of the average market return.

E. The latter ratio is, in fact, the coefficient you would get if you regressed asset a's return on the average market return. For this reason, this ratio is often called asset a's β.

III. The Efficient Markets Hypothesis

A. Once you have a formula for the return on assets, it is pretty obvious what has to happen when new information arrives: Market prices must adjust, rising if there is good news and falling if there is bad news. Otherwise, the return equations would not be satisfied.

B. This becomes more surprising when you reflect on when it is that news "arrives." It often arrives long before anything actually changes! If you find out that a firm has to pay $1 M ten years from now, the price has to fall right away.

1. The same applies to probabilistic news. If it is suddenly revealed that something is more likely to happen than previously thought, asset prices must adjust.

C. Note further: The occurrence of any expected pattern is NOT news.

D. Surprising implication: Asset price *changes* should be completely unpredictable. More technically, asset prices should follow a *random walk*, such as $E(P_{t+1})=P_t$. This is known as the Efficient Markets Hypothesis, or EMH.

E. Even strong critics of the EMH acknowledge that it performs well in many respects. For example, asset prices often fall when profits are announced, and rise when losses are announced. The EMH explanation is simple: In the first case, profits were smaller than expected; in the second case, losses were smaller than expected.

F. Moreover, the EMH passes some surprising empirical tests. You cannot predict annual rates of return for the S&P using past rates of return. In spite of a whole industry of specialists debating whether "this is a good year" to invest, there are no obvious correlations of annual returns.

G. The great practical success of the EMH may be seen in the rise of index funds. Buying and holding diversified bundles of assets has at least the gross return of the average "expertly" managed fund.

1. When you look at net returns, the contest is even more uneven. In a way, though, this is itself anomalous. Search theory suggests that **net** returns should equalize.

IV. Calendar Effects

A. In spite of the logic of the EMH, behavioral economists have uncovered a variety of anomalies. Some of the best-publicized are so-called "calendar effects."

B. Best-known: the "January effect." Average NYSE monthly returns February-December are .5%; average January return is 3.5%. This seems to stem primarily from especially high returns for small firms in January.

C. January effects have been found in 15 out of 16 countries studied.

D. Another calendar anomaly: The weekend effect. If markets close on weekends, average Friday-Monday return should be three times the normal return. If you hold debt, you get three days worth of interest. Why not the same for stocks? In fact, though, Monday returns do not seem especially high.

E. Thaler acknowledges that most anomalies are hard to take advantage of due to transactions costs. But you should still expect people to alter the transactions they were going to make anyway to take advantage of these patterns.

V. Mean Reversion

A. EMH tells us that returns are unpredictable. You cannot use past returns to forecast future returns.

B. A growing literature on "mean reversion" calls this view into question. It offers evidence that unusually high returns in the past predict unusually low returns in the future, and vice versa.

C. Thaler suggests that these patterns arise due to systematic overreaction by investors. Past returns negatively forecast future returns because too many people think that past returns positively forecast future returns.

VI. Betting Market Anomalies

A. Betting markets are a special kind of asset market. The same empirical techniques applied to asset markets have been applied to betting markets.

B. Much about betting markets is as you would expect. There is a very high correlation between subjective and objective probabilities.

C. A large literature tests for anomalies in the price of bets. Once again, some have been found. Probably the best-known is the long-shot bias: Expected returns in horse-racing increase with the probability of the horse winning.

1. One explanation is that at the end of the day bettors switch to a long-shot in order to have a chance of breaking even.

D. Similar anomalies have been found in lottery betting. While conventional wisdom has it that lotteries are a "tax on stupidity," Thaler points to evidence that there are some positive expected sum bets. When you pick your numbers, you should pick unpopular numbers - like non-birthdays.