Exam Asset Pricing
Master Finance - Vrije Universiteit Amsterdam
26 October 2018

Question 1: The Basics

One potential explanation for the size premium is that asset management firms are limited in how much capital they can invest in small stocks.

a. Explain why the size premium represents a mis-allocation of capital (6 points).

In a CAPM world, in equilibrium all stocks should have the same marginal utility *k* given by $E(r_i) - a\sigma_{im} = k$. Now assume that stock A is 5% overpriced, and stock B is 10% underpriced.

b. Explain what is the marginal utility for stocks A and B (6 points).

The most widely used method to test whether certain variables are related to expected stock returns, is the Fama and MacBeth (1973) method. Imagine you want to use the Fama-MacBeth method to test whether an individual stock's liquidity is priced next to a stock's exposure to market-wide liquidity.

c. Explain step-by-step how you would test the liquidity problem (8 points).

<PLEASE TURN OVER FOR QUESTION 2>

Question 2: Factor Models

ETF's are typically classified among two dimensions: value versus growth, and large cap versus small cap. Now imagine that I have downloaded the returns of an ETF from iShares, but I forgot what type of ETF it was. To find out how this ETF scores on the two dimensions, I ran the five factor model including momentum. The table below gives the results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026433	0.076013	0.347746	0.7284
MKTRF	1.004713	0.021773	46.14397	0.0000
SMB	0.883301	0.030485	28.97451	0.0000
HML	0.283600	0.033873	8.372528	0.0000
RMW	0.214169	0.039978	5.357229	0.0000
CMA	0.026546	0.046611	0.569509	0.5696
MOM	-0.016218	0.015940	-1.017401	0.3101

R-squared	0.963511	Mean dependent var	1.008571
Adjusted R-squared	0.962469	S.D. dependent var	5.384722
S.E. of regression	1.043181	Akaike info criterion	2.954152
Sum squared resid	228.5274	Schwarz criterion	3.063181
Log likelihood	-313.5255	Hannan-Quinn criter.	2.998195
F-statistic	924.2022	Durbin-Watson stat	1.882132
Prob(F-statistic)	0.000000		

a. Explain what the estimated coefficients should be for the CAPM to hold (5 points).

A good asset pricing model is able to explain all variation in the returns to an asset.

b. Explain, based on the estimation results, whether the 6-factor model as applied above is a good asset pricing model (5 points).

c. Based on the estimation results in the table, explain what type of ETF this is in terms of value versus growth and large versus small cap (7 points).

<PLEASE TURN OVER FOR QUESTION 3>

Question 3: Behavioral Finance

Arbitrage is a central concept within finance. Behavioral finance recognizes this, but argues that textbook arbitrage is not always perfect due to certain costs and risks. Noise trader risk is one of them.

a. Explain how 'noise trader risk' affects market efficiency. Distinguish between the short run and the long run in your answer (6 points).

One of the limits to arbitrage, 'noise trader risk', is further developed in the study by DeLong, Shleifer, Summer, and Waldman (1990). In their model, the return difference between sophisticated traders and noise trader is given by

$$E(\Delta R_{n-i}) = \rho^* - \frac{(1+r)^2(\rho^*)^2 + (1+r)^2\sigma_\rho^2}{(2\gamma)\mu\sigma_\rho^2}.$$

In which ρ^* is the average misperception of noise traders, r the risk-free rate, σ the variation in the misperception, and γ the risk aversion.

b. Explain how a higher average misperception ρ^* has both a positive and a negative effect on the return differential (6 points).

It is hard to construct an empirical measure for noise trader risk. There are, however, two empirical regularities that a measure of noise trader risk, also called investor sentiment, should have: 1) the measure should have a positive correlation with contemporaneous returns; 2) the measure should have a negative correlation with lagged returns.

c. Explain why investor sentiment should have this correlation structure with returns (6 points).

<PLEASE TURN OVER FOR QUESTION 4>

Question 4: Utility and Market Microstructure

An investor is checking the value of her portfolio. Now consider the following two situations:

1. Total return is +1%
2. Dividend is +2%, price change is -1%.

a. Explain which of the two situations is preferred by the Prospect Theory Investor (5 points).

Theoretically, there are two types of markets: order driven and quote driven.

b. Explain how liquidity is formed in both types (6 points).

Due to technological progress, stock exchanges are now (almost) fully digital. This opens the possibility for competition between exchanges. As a result, single stocks are now traded on multiple exchanges. Another consequence, is the rise of dark pools.

c. Explain why institutional investors prefer to trade on a dark pool instead of a regular exchange (6 points).

<PLEASE TURN OVER FOR QUESTION 5>

Question 5: Market Frictions

The following text is an article from Bloomberg.

Fund Carnage Shows Peril of Ignoring Liquidity

Indian equity managers were reckless to pile into thinly traded shares. Brace for worse if investors run for the exits.
By Andy Mukherjee

October 12, 2018, 1:00 AM GMT+2 Updated on October 12, 2018, 11:39 AM GMT+2
Indian retail investors won't easily forgive their fund managers, nor will they quickly forget this wealth destruction.
Out of 416 open-ended, onshore equity funds, 401 have lost money this year. Tech funds, the only ones to have performed decently, have been helped by Asia's worst-performing currency of 2018. And that's only because Indian software exporters earn revenues in a strong dollar and pay wages in rupees.
Most other mutual funds are down – many of them 20 percent to 40 percent in a flat market. Individual investors started returning to collective investment vehicles after the 2014 general elections, hoping for a reset to an economy held back by corruption scandals and policy paralysis. They doubled down after Prime Minister Narendra Modi's shock November 2016 currency ban pulled 86 percent of people's cash into bank accounts.
But now disappointment is writ large.
Fund managers who'd hoped for private-equity type returns by discovering jewels buried in the haystacks of public markets were essentially souping up performance by forgoing liquidity. Now that the markets are punishing them for that recklessness, the search for the elusive alpha is over — in infrastructure; power; banking and finance; small-, mid- and micro-cap shares; transport and logistics; value stocks; state-owned firms; business cycles; and every other fad.
With fund asset values collapsing, what happens if investors get up and leave?
Since May 2014, investors have put more money into Indian equity funds than they have pulled out in every month except one. Even during last month's brutal sell-off, they poured 111 billion rupees ($1.5 billion) into stock funds, the most since May. However, "buy-on-dips" greed can't last if asset prices don't recover.
A rush for the exits may cause its own problems, especially when it comes to handling redemption pressures. On conservative estimates, it would take more than 30 days to offload a quarter of the net assets of one small Indian infrastructure fund, Bloomberg's liquidity tools show. A fifth of a large tax-saver fund would need more than 180 days to dismantle, so thin is the liquidity of the stocks it holds. (By contrast, a typical index fund tracking the Nifty 50 can be entirely liquidated in less than three days.)
Concerns around liquidity have been elevated ever since IL&FS Group, a highly rated Mumbai-based infrastructure financier, started missing debt payments. The panic from this mini-Lehman moment spread last month to money-market mutual funds, which have been providing most of the credit to housing-finance companies and other non-bank lenders. Then it was the stock market's turn to focus on asset-liability mismatches by pummeling the likes of Dewan Housing Finance Corp.

a. Explain the liquidity issues of Indian funds by means of the results of Pastor and Stambaugh (2003) (5 points).

b. Explain why there are always short-sale constraints, even without an explicit ban on short selling (5 points).

Hong and Sraer (2016) try to ‘save’ the CAPM by taking disagreement and short-sale constraints into account.

c. Explain how both disagreement and short-sale constraints contribute to the rescue of the CAPM in the study by Hong and Sraer (7 points).

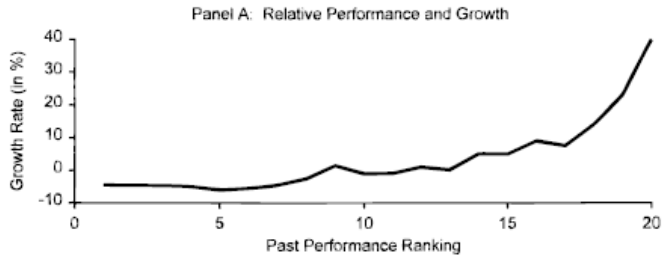
<PLEASE TURN OVER FOR QUESTION 6>

Question 6: Delegated Asset Management

We have seen that the typical mutual fund underperforms relative to typical factor models.

a. Explain why funds are currently focusing on 'factor premia' rather than 'outperformance' (5 points).

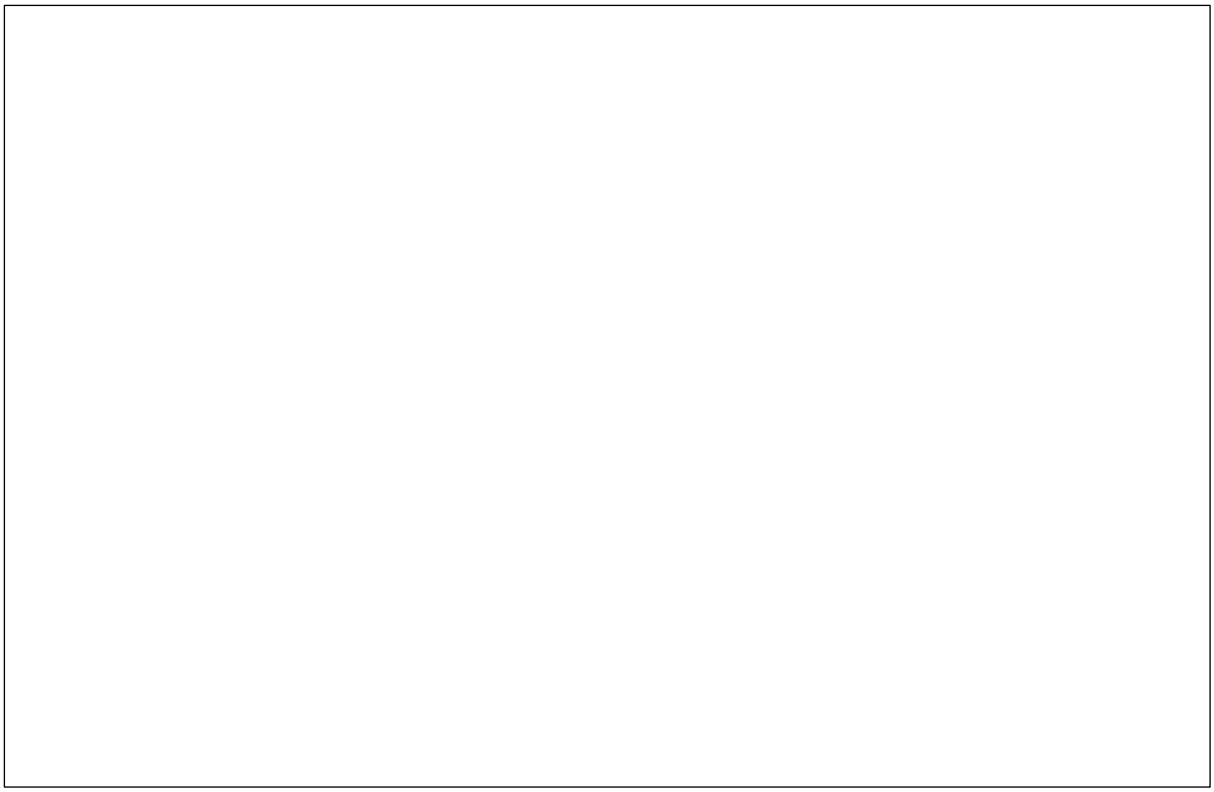
Mutual fund managers have the incentive to grow the size of their fund. This can be done through 1) performance, and 2) capital inflow. The figure below shows the performance-flow relationship.



b. Explain which of the two methods is more effective in growing a fund (5 points).

Throughout the course, we have often discussed the two main schools of thought in finance: 'neo-classical' versus 'behavioral'.

c. Given an informed and motivated opinion whether your view is closer to the neoclassical or behavioral camp (6 points).



<END OF THE EXAM!>