219B – Problem Set 3 – Due in class on March 21, 2007
1/N Heuristic and Limited Attention

Question #1. 1/N Heuristic

This question concerns the empirical evidence for the 1/N heuristic, and in particular the evidence in Benartzi and Thaler, "Naive Diversification Strategies in Defined Contribution Savings Plans", AER, 2001 and in the later paper by Huberman and Jiang, "Offering vs. Choice in 401(k) Plans: Equity Exposure and Number of Funds", Journal of Finance, 2006.

a) How would you define the 1/N heuristic?

b) Benartzi and Thaler (2001) collect data on investment in 401(k) plans across 162 companies. They investigate how the share of money invested in equity on average in a 401(k) plan ($\%Invested\ In\ Equity$) varies as a function of the number of equity funds in the plan ($\%Equity\ Options$). They find the following linear relationship:

$$\%Invested\ In\ Equity\ =\ \alpha + .63 * \%Equity\ Options. \text{(N=162)}$$
$$(.09)$$

Interpret the economic content and the magnitudes of this finding.

c) Relate the finding to the 1/N heuristic.

d) What are the confounding factors and alternative interpretations of the result above?

e) In their 2006 paper, Huberman and Jiang use an alternative, richer data set to provide a new test of the Benartzi and Thaler findings. Do you remember the main differences between the Benartzi and Thaler data and the Huberman and Jiang data of 401(k) plans?

f) Huberman and Jiang (2006) find

$$\%Invested\ In\ Equity\ =\ \alpha + .29 * \%Equity\ Options.$$
$$(.06)$$

for funds with less than 10 options and

$$\%Invested\ In\ Equity\ =\ \alpha + .06 * \%Equity\ Options.$$
$$(.07)$$

for funds with more than 10 options. You can find these results in Panel A of Table IV. Are these two findings supportive of the 1/N heuristics? Discuss (This is a fairly open-ended question) [In Benartzi and Thaler, the median 401(k) plan has 6.8 investment options]

g) Why do Huberman and Jiang (2006) cluster the standard errors at the level of the company? (see the Notes to Table IV). Give an assumption of a (plausible) correlation in the error term that this correlation allows.

h) Huberman and Jiang also characterize the relationship between the total number of funds chosen by an individual and the total number of funds offered by the fund (see Figure 2(a)). [Here, we are not distinguishing any more between equity and non-equity investments] How do you characterize this result? To what extent does this result contradict the definition of 1/N heuristic that you gave in point a)?

i) Can you sketch a version of that 1/N heuristic that stands up to the evidence in both Benartzi and Thaler (2001) and Huberman and Jiang (2006)?

j) (Open-ended) Can you think of another setting where one could test for the 1/N heuristic?

Question #2. Limited Attention.

The papers on inattention can be categorized broadly into two groups: (i) *Underweighting of non-salient information.* Papers that make the point that investors or consumers pay too little attention to information that is important; (ii) *Overweighting of salient information.* Papers that show that investors or consumers pay too much attention to information that is not very important. (These two strategies are the ones that Danny Kahneman drew our attention to during the 'Psychology and Demography' meeting) In this question, I want to push you to summarize the inattention literature in these terms, and think of possible new tests of inattention along other dimensions.

(a) Frame in these terms the following papers. For each paper, provide a one-paragraph summary of the main finding, and interpret it in light of one of the two categories above.
   i. Chetty, Looney, and Kroft (2007);
   ii. Cohen and Frazzini (2006);
   iii. DellaVigna and Pollet (2005);
   iv. Hossain and Morgan (2006);
   v. Huberman and Regev (2001);
   vi. Lee and Malmendier (2006).

(b) (Open-ended) Can you think of another case of information that is not salient that consumers, investors, or voters may (partially) neglect? How would you test that these agents are making a mistake by neglecting this variable?

(c) (Open-ended) The converse: Can you think of another case of very salient information that consumers, investors, or voters respond too much to? How would you test that these agents are making a mistake by responding as much to this variable?

References
* Benartzi, Shlomo and Richard H. Thaler. 2001. "Naive Diversification Strategies in Defined Contribution Saving Plans." *American Economic Review*, 91(1): 79-98.
   Chetty, Raj, Looney, Adam, and Kroft, Kory. "Salience and Taxation: Theory and Evidence from a Field Experiment", 2007.
* Cohen, Lauren, and Frazzini, Andrea. 2006. "Economic Links and Predictable Returns", mimeo.

DellaVigna, Stefano and Joshua Pollet. 2006a. "Attention, Demographics, and The Stock Market," NBER Working Paper.

* Hossain, Tanjim and John Morgan. 2006. "...Plus Shipping and Handling: Revenue (Non) Equivalence in Field Experiments on eBay," *Advances in Economic Analysis & Policy*, 6(2): 1429-1429.

* Huberman, Gur, and Wei Jiang. 2006. "Offering vs. Choice in 401(k) Plans: Equity Exposure and Number of Funds." *Journal of Finance*, 61(2): 763-801.

Huberman, Gur, and Tomer Regev. 2001. "Contagious Speculation and a Cure for Cancer: A Nonevent that Made Stock Prices Soar." Journal of Finance, 56(1): 387-396.

* Lee, Hanh, and Malmendier, Ulrike. 2006 "The Bidder's Curse", mimeo.