

219B – Problem Set 3a – Due in class on 1/N Heuristics

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:

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

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?

References

* Benartzi, Shlomo and Richard H. Thaler. 2001. "Naive Diversification Strategies in Defined Contribution Saving Plans." *American Economic Review*, 91(1): 79-98.

* 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.