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Bargain Hunting or Star Gazing? Investors' Preferences for Stock Mutual Funds*

I. Introduction

In 1924, The Massachusetts Investors' Trust became the world's first open-end mutual fund with a portfolio of 45 stocks and an asset base of $50,000. Despite their early beginnings, mutual funds created hardly a ripple in financial markets for the next 50 years. Even as late as 1990, mutual funds ranked fifth in asset holdings among major financial intermediaries behind commercial banks, private pension funds, thrifts, and life insurance companies.[1] What has emerged in the last several years is an industry whose assets now outrank those of any other financial intermediary, an industry that has focused its attention on marketing its products to a broad cross section of the population, and an industry that now must deal with many of the traditional marketing problems long associated with

Investors who wish to purchase shares in mutual funds balance many types of information, from a variety of sources, when making their fund selection. This research examines how investors choose a mutual fund within a given class of funds. Among the major findings are that investors pay a great deal of attention to past performance and vastly overweight loads relative to expense ratios when evaluating a fund's overall fee structure. I also find that investors with a greater knowledge of basic finance are less likely, not more likely, to make reasonable fund choices.

1. Investment Company Institute's 1999 *The Mutual Fund Fact Book*.

consumer products.[2]

While the need for effective marketing is well understood by mutual fund companies (Geer 1997; Walbert 1997), we have a limited understanding of how consumers make product choices in this marketplace. Consequently, this multitrillion-dollar industry, as well as government agencies charged with regulating this marketplace, are left to make their marketing and public policy decisions with little knowledge of consumers' choice processes—choice processes that have grown significantly more complicated over the last few years.

Investment decision making has evolved from simple bank-oriented investing to a vastly more complex decision process. In addition to the increasing portfolio of financial products that banks and insurance companies market, consumers can choose from over 8,000 open-end mutual funds.[3] Even in the face of recent weakness in the equity markets, capital inflows to mutual funds have continued to increase. The year ending December 31, 2000, saw new mutual fund investments by shareholders top $350 billion and brought the total assets held in mutual funds to just under $7 trillion.[4] Clearly, mutual funds have developed into a very successful class of products, and their success appears to be durable in the face of varying marketing conditions.

Shopping for financial instruments has become increasingly like shopping for many other consumer items. Much like *Consumer Reports* rates the quality of a variety of items we buy, there is no shortage of publicly available information that purports to offer insight on the "quality" of different mutual funds. Consumers can readily gather information on the past history of different funds, the costs associated with purchasing and holding shares in each fund, as well as the funds' stated investment goals. With all the choices and sources of information available to them, consumers have become much more involved in their own investment choices (Levitt 1998). Academics reading this article will no doubt have made some of their own investment choices from the family of funds offered by TIAA-CREF, as well as other fund companies allied with their pension plan. Practitioners will have made similar choices through their 401(k), Keogh, or 403(b) plans.

This research examines consumers preferences for stock mutual funds. While there have been other studies that approach this problem by using aggregate fund flows data (Sirri and Tufano 1998) or through a survey designed to elicit self-explicated preferences (Capon, Fitzimmons, and Prince 1996) my research infers individual-level preferences by putting a group of mutual fund investors through a carefully designed set of conjoint experiments. Because determining what affects mutual fund choice is a very broad question, I focus

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2. Sirri and Tufano (1993) report that over half of the total expenses incurred by mutual fund companies are for marketing related activities. People who purchase mutual fund shares are both investors in the underlying assets of the fund and consumers of the services provided by the fund. Thus, throughout this article I will use the terms *investor* and *consumer* interchangeably.

3. See *The Mutual Fund Fact Book* (1999). The fact book also reports that about one in three U.S. households now owns mutual fund shares.

4. See Collins (2001).

attention on two important and interrelated issues. First, I describe the results of our conjoint experiments and in so doing reveal some of the important attributes of mutual fund choice. Second, and perhaps more important, I attempt to characterize those individuals who are more likely to make reasonable decisions in this marketplace versus those who are less likely to do so. The information gleaned from this particular exercise directly calls into question our understanding of what constitutes a "naive" and "savvy" mutual fund investor. It provides needed information both to businesses competing in this marketplace as well as to government agencies, most notably the U.S. Securities and Exchange Commission (SEC), charged with regulating this marketplace.

The rest of this article is organized as follows. In the first section I describe the conjoint experiment, setting out the experimental design and providing information on the investors who participated. Section II begins with information on the Bayesian hierarchical procedure used to estimate individual-level utilities from the choice data and moves on to describe the results of the estimation. Section III provides comments on the results and in particular examines those results in light of what might be considered a reasonable way to evaluate mutual funds. Section IV describes the links between estimated attribute importances and information collected that profiles the investors participating in the study. Finally, Section V describes the limitations of the research, summarizes the conclusions, and points to new research directions in this area.

II.   A Conjoint Study of Mutual Fund Investors' Preferences

Consumers choose one mutual fund over another for a variety of reasons. Probably the most important attribute a consumer considers is the investment goal of the fund. Mutual funds can concentrate their investments in any number of instruments (e.g., U.S. stocks, municipal bonds, government-backed mortgage obligations, etc.) or diversify across a wide range of assets. Balancing the different types of assets that an investor holds in his or her portfolio (optimal portfolio selection) is an area that has received tremendous attention in the finance literature, both popular and academic. It is a topic that is included in all the popular investment analysis texts (e.g., Sharpe and Alexander 1995) and is a skill that is fundamental to anyone trained in finance. I will assume that the investor has already made his or her asset allocation decision and now must weigh the attributes of the many mutual funds that will satisfy his or her asset allocation objectives. Because most of the previous research in this area has focused on stock mutual funds, the largest class of mutual funds, I will also structure the experimental study in terms of stock mutual funds.

I measure the utility derived from different stock mutual fund attributes via choice-based conjoint analysis. Huber (1997) argues that the choice task approach of choice-based conjoint is more immediate and concrete than the abstract rating or ranking tasks utilized by other methods of conjoint analysis.

Thus, it is expected that the external validity of this method will be higher than that of ratings- or rankings-based approaches.[5] Consumers were presented profiles of different stock mutual funds and asked to select their most preferred fund. The hedonic utilities generated by the different levels of each attribute can be estimated by observing consumers' choices. I estimate individual-level logit utilities to facilitate the inquiry into individual-level preferences in this market.

Experimental conjoint choice task data were collected from 50 current mutual fund investors. Each participant was asked 20 choice tasks, leading to a total of 1,000 experimental choices on which to estimate the model.[6] Beyond the choice tasks, a 10-question quiz of basic financial knowledge was administered and each participant asked to provide information on his or her demographic profile.[7] The demographic characteristics of these consumers were quite diverse.[8] Levels of the following attributes were tested in the conjoint study: (1) the fund's load, (2) the management fee charged by the fund, (3) the company name, (4) fund performance over the previous year, (5) average annual performance over the previous 10 years, and (6) the fund's beta rating.[9]

These attributes were selected to correspond to the information provided to potential investors in a fund's prospectus, as well as information commonly provided in a fund's annual report. While there certainly are other attributes that may influence fund choice, I restricted attention to these attributes to focus on the importance of past performance and fee structure in the mutual fund choice process. Including additional attributes also risks inducing information overload for the participants and reducing the reliability of the results.[10]

The fund cost information is presented in a format consistent with that found in a fund's prospectus.[11] Mutual fund companies are required by law to calculate the actual dollar cost of the load and management fee structure they currently charge for various holding times, assuming a 5% market return and a $1,000 initial investment. They are also required to inform potential customers that this information cannot be used to predict future fees that the fund may charge. In the conjoint task presented to consumers, there are 36 possible load and management fee combinations. For each of these combinations I developed a schedule of actual costs, virtually identical to that which

5. For a discussion of the external validity of conjoint analysis, see Srinivasan (1999).
6. The number of choice tasks is within the range suggested by Johnson and Orme (1996).
7. The finance quiz can be found in app. B. It was adapted from the quiz used by the Vanguard Group in the "Vanguard University" section of their Web site (http://flagship.vanguard.com).
8. A breakdown of the demographics of the sample is available from the author on request.
9. A beta rating measures the covariance of a fund's share price with a relevant index (usually the S&P 500 for domestic equity funds). While it is not directly a measure of volatility, many practitioners use it as a proxy for volatility.
10. For a discussion of information overload in choice-based conjoint analysis, see Orme (1999).
11. See app. C for an example.

TABLE 1   Experimental Choice Design

Company	Load (%)	Management Fee (%)	1-Year Return (%)	10-Year Return (%)	Beta Rating
Fidelity	No load	0	10	5	.7
Vanguard	1	.5	20	10	.9
T. Rowe Price	2	1.0	30	15	1.1
Dreyfus	3	1.5	40	20	1.3
Pecunia	4	2.0	50	25	1.5
	5	2.5			

would appear in a prospectus. These 36 schedules were organized into a short manual that was given to participants and could be referenced at any point during the conjoint tasks. Thus, for any profile that could appear in the choice tasks, participants had access to the same type of cost information that they would have had from a prospectus.

The choice tasks presented full product profiles in triplets and asked consumers which fund they preferred. I employed a random profile design. The levels chosen for each of the attributes are given in table 1.

The levels of the attributes were chosen to reflect market conditions at the time of this study. The company name Pecunia is fictitious and is included as a benchmark for the utility of company names.

A. Results

The individual-level estimates were generated using a Bayesian hierarchical procedure. The procedure follows Lenk et al. (1996) quite closely, except that because I use choice-based rather than ratings-based conjoint, I have a multinomial logit model instead of a linear model at the base of the hierarchy. Those interested in the details of the estimation procedure are referred to the aforementioned paper. The distributional assumptions and resulting full conditional distributions are set out in appendix A.

I estimated logit utilities for each attribute level for each person in the sample. This resulted in $32 \times 50 = 1,600$ estimated logit utilities. The most instructive way to summarize this information is to examine the estimated attribute importance weights derived from the utility estimates. For each individual, I calculated the relative importance weight of each attribute by taking the ratio of each attribute's range in utility to the sum of the ranges of all the attributes. For example, if $\overline{U}_{ij}$ is the estimated utility for the most desired level of attribute j for person i, and $\underline{U}_{ij}$ is the least desired level for the same attribute/person, then the importance weight of attribute j relative to that of all other attributes $k \in K$ for person i can be calculated as

$$M_{ij} = \frac{\overline{U}_{ij} - \underline{U}_{ij}}{\sum_{k \in K} \overline{U}_{ik} - \underline{U}_{ik}}.$$

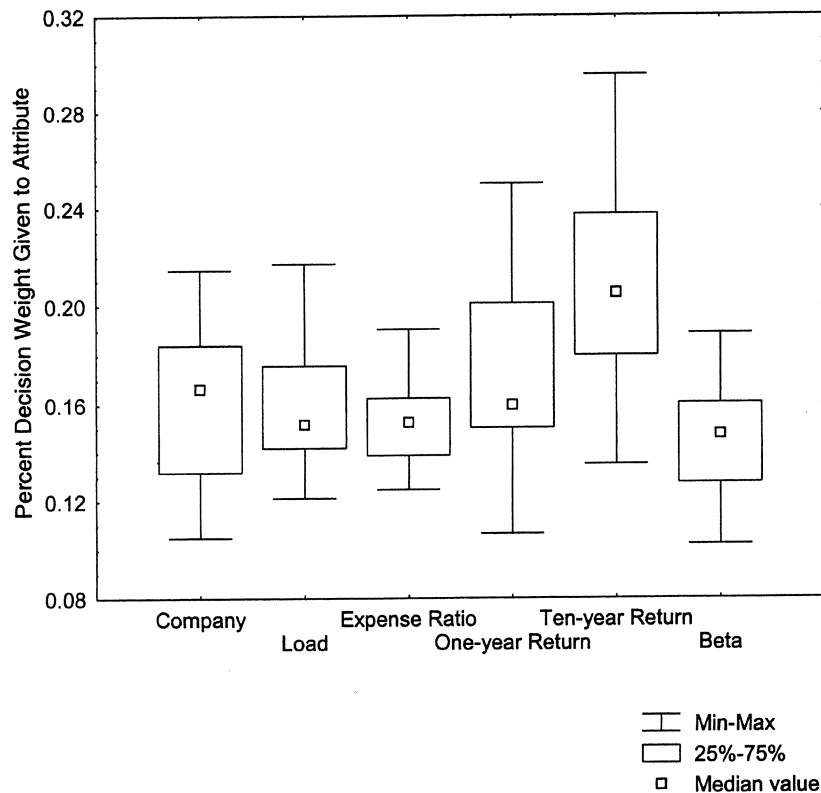These provide a direct measure of how consumers are weighting each of the

FIG. 1.—Relative importance of attributes

attributes in their decision. Box plots of the individual-level attribute importance weights are depicted in figure 1.

B. The Importance of Past Performance

The results indicate that past performance is very important to consumers and weighs more heavily in the decision process than fees. The two most important attributes for mutual fund choice, as measured by the mean attribute importance weighting, are 10-year and 1-year past returns. In many ways this result is not surprising. It is consistent with the aggregate-level analysis of Sirri and Tufano (1998), which finds that money flows into funds with recent above-average performance, and the self-explicated preference approach of Capon et al. (1996). It is also consistent with the idea that consumers, when faced with complex choice tasks, will tend to pay more attention to information that is cognitively accessible to them and ignore features or attributes that are difficult to evaluate. This is a central point of the behavioral decision research

of Hsee et al. (1999). In the context of the conjoint analysis, past-performance metrics are easy to understand, while fees, and the trade-offs between the two different fees presented, are a cognitively more difficult task.

Two other results related to past performance deserve comment. Because the past-performance metrics are not risk adjusted, I cannot make a definitive comment about the role that past performance should play in a person's mutual fund evaluation. However, within the finance literature there is weak and controversial evidence that past performance has much, if any, predictive ability for future returns. Overall, two themes emerge from the finance literature about mutual fund performance. First, it is very difficult to detect persistence in risk-adjusted mutual fund performance. Whether or not this persistence is detected depends critically on exactly how one is measuring performance, and there is far from a consensus on the metrics that should be used to measure performance. Second, even using relatively sophisticated techniques to construct portfolios of actively managed stock mutual funds, it remains difficult to consistently outperform passively managed index funds.[12] Thus, even though I was not able to directly test whether investors did put significant weight on risk-adjusted past performance, the results are suggestive of the idea that investors weigh past performance more heavily than is reasonable.

Second, do investors who plan on holding a fund for a short amount of time pay more attention to past performance relative to longer-horizon investors? The preconjoint questionnaire does not capture precisely how long an investor will hold a mutual fund—it only captures their investment time horizon.[13] An investor might plan on holding money in stock mutual funds for, say, 10 years but switch funds several times during that time period. Thus, I cannot provide a decisive answer to this question. However, the data do provide some prima facie evidence that consumers who plan on holding the fund for a relatively short time pay more attention to past performance than other investors do. The Pearson correlation between the stated investment time horizon and the estimated importance of 1-year past performance is $-.54$ ($p = .001$). Using the 10-year past performance instead yields a correlation of $-.62$ ($p = .001$). Both correlations are significant. It appears that investors with shorter investment horizons pay more attention to past performance than their longer-horizon counterparts.

12. Index funds attempt to replicate a sector of the financial market. The most common type of index fund replicates the portfolio of stocks comprising the S&P Composite Stock Price Index. Because they only attempt to replicate a sector of the market and are not actively managed, they typically have much lower costs than actively managed funds. Those interested in the literature about the persistence of mutual fund performance are referred to Blake, Elton, and Gruber (1993), Hendricks, Patel, and Zeckhauser (1993), Elton, Gruber, and Blake (1996), Gruber (1996), Sirri and Tufano (1998), and Zheng (1999).

13. The mean investment time horizon in the data is 19.7 years. This long horizon is not surprising, given that most people (84%) indicate that retirement is one of the primary reasons they invest in mutual funds (*The Mutual Fund Fact Book* 1999).

C. The Importance of Fund Fees

The evaluation of mutual fund fees allows some opportunity to comment normatively about investors' fund selection process. There is substantial evidence that the overall cost of owning a particular mutual fund provides consumers with information about a fund's expected future total return relative to that of other similar funds. Costs are much more stable over time than gross past performance (Trczinka and Zweig 1990) and account for much of the long-run differences observed in performance (Grinblatt and Titman 1992; Blake et al. 1993; Malkiel 1995). Put simply, there are two distinct elements that affect the relative performance of a given mutual fund within a class of funds. First, the ability or inability of the fund's manager(s) to select assets that provide superior returns affects the gross return-on-assets of the fund. If the manager(s) selects assets well, the fund is likely to outperform other funds in the same class. If the manager(s) selects poorly, the fund will underperform similar funds. Second, the fees that a fund charges reduce the net return on assets to its customers. Previous research indicates that the first element, a manager's asset-picking ability, is not material to the long-run relative performance of the fund. Indeed, the research indicates that asset-picking ability probably does not even exist in the popular sense of the term. Given that this component of the fund's relative return can be best described as random, the magnitude of the fees ultimately determined the fund's long-run relative performance. The academic record on fund expenses is absolutely clear. Investors should pay a great deal of attention to the fee structure imposed by various funds when making a fund selection.

Examining the results of the individual-level conjoint analysis yields several interesting insights into how investors evaluate fees. First, investors pay less attention to fees than to past-performance metrics. Only the estimated importance weights for the beta rating of a fund have a lower mean than that of the load and expense ratio. More interesting than the direct measure of load and expense ratio importance is their relationship to each other. Define FEE RATIO$_i$ = 2 × ($M_{i\text{EXPENSE RATIO}}/M_{i\text{LOAD}}$).[14] This ratio represents the utility trade-off for investor i between a 1-basis-point change in a fund's expense ratio versus its load. Given that expenses are deducted on a yearly basis, and a front-end load is a one-time fee, one would naturally expect FEE RATIO$_i$ to be reasonably close and positively related to investor i's self-reported expected holding period for the fund. In other words, if investor i expects to hold the fund for 5 years, then the expected cost of a 1-basis-point change in expense ratio is approximately five times that of a 1-basis-
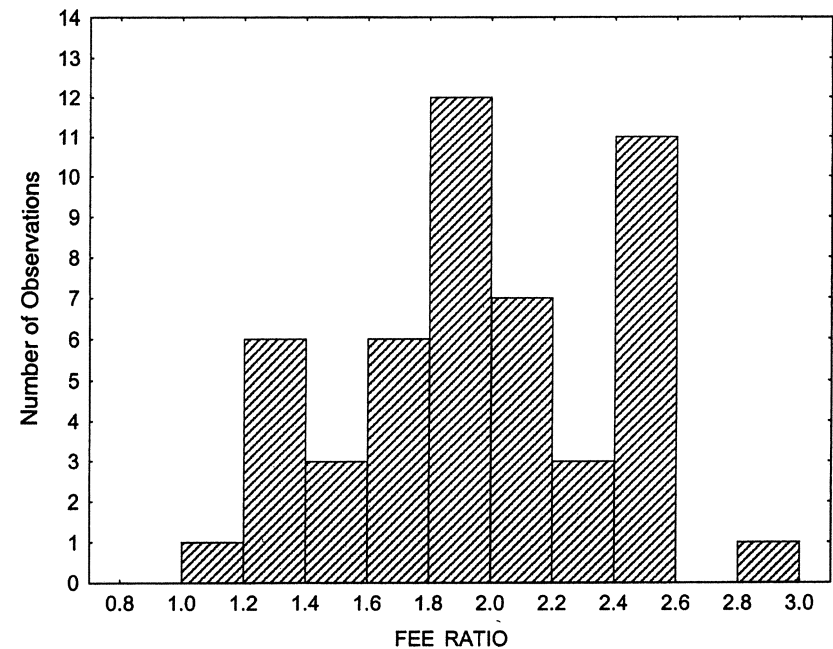

FIG. 2.—Histogram of estimated individual-level FEE RATIOs

point change in load.[15] If the investor is evaluating the fees that a fund charges in a reasonable manner, this trade-off should be reflected in the estimated importances of the two fees. Our results do not support reasonable decision making in this regard. Figure 2 presents a histogram of the estimated FEE RATIO values across the sample.

The mean of FEE RATIO is 1.95, while the self-reported mean expected holding time is about 17 years. Even acknowledging the fact that self-reported holding times probably overestimate true holding periods, industry studies have shown that the average mutual fund investor redeems shares very infrequently.[16] Thus, a mean FEE RATIO of 1.95 is less than what one would expect from investors who are making optimal trade-offs between loads and annual expenses. Further, not a single individual in our sample had an estimated FEE RATIO greater than three. It is virtually inconceivable that some,

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14. Multiplying $M_{i\text{EXPENSE RATIO}}$ by two is necessary because the range of expense ratios is half that of front-end loads in the experimental design.

15. Formally, the discrete-time net present value for any given load l and expense ratio f for an investment of p that is held in the fund for n years can be given by $E[C_i] = p_i l + \sum_{t=1}^{n_i} [(p_i - p_i l)(1 + r_i)^t (1 - f)^{t-1} f (1 + \beta_i)^t]$, where β is the discount factor. While this function appears highly nonlinear in l and f, it is well approximated by a linear function for load and expense-ratio values typically observed in the marketplace.

16. Several studies that examine mutual fund redemption behavior are published by the Investment Company Institute (www.ici.org), the principle trade organization for the mutual fund industry.

if not a substantial proportion, of these investors would hold their funds for a period of greater than 3 years. Taken together, these results suggest that a strong aversion to front-end loads and a commensurate disregard for annual expense ratios exists in this marketplace.

D. Who Makes the Best Decisions?

The results shown above suggest that consumers pay a great deal of attention to past returns and that they overweight loads relative to management fees in their decision process. I believe it is also interesting and useful, to the extent possible, to attempt to characterize those individuals who are the most likely to make more reasonable decisions in this marketplace, as well as those consumers who are likely to make poor decisions. To this end, I collected some basic demographic information from participants and also asked them to complete a 10-question finance quiz designed to test their knowledge of basic finance and investing. A copy of this quiz can be found in appendix B.[17]

I will use the above-mentioned data to help make inferences about how different types of investors behave in this marketplace. The hierarchical Bayes framework provides a natural means to incorporate this information into the model. This framework uses the demographic and finance quiz variables as prior information to help generate the individual-level estimates.[18] By manipulating this information and examining how the individual-level estimates change, I can directly infer the impact of each variable of interest on the estimated utilities. Specifically, I collected and used the following individual-level information in the estimation:

INCOME: a categorical variable denoting the income range indicated on the questionnaire. The variable is coded such that increasing values represent increasing income.

EDUCATION: a categorical variable denoting the educational level indicated on the questionnaire. Again, increasing values represent increasing educational levels.

SEX: a dummy variable indicated the sex of the investor.

PORTFOLIO COMPLEXITY: a variable indicating the number of different kinds of mutual funds (U.S. stocks, government bonds, etc.) in which the respondent indicated that they were currently invested.

PLANNING HORIZON: the number of years that the respondent planned on keeping a "substantial amount of money" in the mutual funds in which they were currently invested.

FINANCE QUIZ SCORE: the total number of correct answers on a ten question finance quiz.

I chose these specific variables because I believed that there is a strong popular perception that individual investors who are (1) wealthier, (2) more highly

TABLE 2   Attribute Weights by Demographic and Finance Quiz Profile (%)

Investor Profile Variables of Interest	Company	Load	Expense Ratio	1-Year	10-Year	Beta
Men (women)	−5.9	−17.7*	−2.0	−3.6	2.3	32.5*
Wealthy (average wealth)	−5.0	−7.6	−11.8*	−12.2*	24.4*	9.0
Highly educated (average education)	−8.1	3.2	−13.1*	26.3*	1.9	−2.1
Complex portfolio (average portfolio)	−.6	−1.2	−.7	1.8	1.0	.3
High quiz score (average score)	−9.4*	10.0*	−27.4*	19.6*	−10.0*	36.0*
Long time horizon (average horizon)	24.0*	6.7	−3.9	−12.8*	−6.8	.0

   * Significance at the $p < .05$ level.

educated, (3) men, (4) have more complex portfolios, and are (5) more knowledgeable about popular finance-related issues would be "better" mutual fund investors. I also included the measure PLANNING HORIZON because it is reasonable to believe that individuals who plan to hold a fund longer, in addition to paying less attention to past performance as documented earlier, would tend to give front-end loads less weight and annual expenses more weight in the decision process.

Table 2 provides the results of the analysis. It reports the estimated model's prediction of the importance weight is given to attributes for individual investors with different demographic profiles. These utility weight predictions are obtained by using the mean of the posterior distributions of the coefficients for the demographic and finance quiz variables. This analysis provides a prediction of how attribute weights change across different investor profiles. The leftmost column of table 2 lists the investor profile variables of interest. The subsequent columns provide estimated attribute weight changes for each of the attributes tested in the conjoint analysis. These estimated changes are reported with respect to the unbracketed value of a profile variable relative to the bracketed value of the same variable. For example, the utility weight given to 1-year past performance is predicted to be 26.3% higher for highly educated investors relative to investors with an average level of education, holding all other profile variables constant.[19]

The results directly call into question popular perceptions about investing. As I have previously argued, the finance literature has generally advocated paying considerable attention to the fees that a fund charges. Are highly educated, wealthy men getting the message? No. In fact, the data are more supportive of the conclusion that these investors are worse rather than better at selecting mutual funds. Examining the predicted change in decision weights for highly educated and wealthy investors indicates a decreased emphasis on

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17. This quiz was adapted from one that Vanguard, Inc., a large marketer of mutual funds, posts on their Web site. It is intended to give potential investors an idea of their financial savvy.
   18. Appendix A provides the details about how the data enter the estimation.

19. The variables are operationized such that "average" refers to the mean level of the variable in the sample, while terms such as *wealthy* and *high quiz score*, etc., refer to the highest level of these variables observed in the sample.

fees. More direct evidence of poorer decision making is available by examining the ratio of the changes in LOAD and EXPENSE RATIO importance weights for wealthy and highly educated investors. Section IIC documented that, on average, investors overweight loads relative to expense ratios when evaluating fee structures. For both wealthy and highly educated investors there is a significant drop in the weight placed on EXPENSE RATIO (-11.8% and -13.1%, respectively), while no significant change is observed in the evaluation of LOAD. This directly implies that wealthy and highly educated investors are more rather than less biased in their evaluation of fee structures. It is also notable that both of these groups shift more of their decision weight to past-performance metrics.

Perhaps our most striking results are those associated with the finance quiz. Examining the predicted behavior of our potentially most "savvy" group of investors, those who have high scores on the finance quiz, reveals that the mutual fund decision weight attributed to the expense ratio drops by 27.4%, while that of load increases by 10.0%. In other words, the model predicts that those who demonstrate the most knowledge of basic popular finance concepts are again markedly more biased in their evaluation of fund fee structures than the sample as a whole. Note that these same individuals significantly increased their reliance on short-term performance metrics (19.6%).

I found little in the way of evidence that the number of different types of funds held by an investor (PORTFOLIO COMPLEXITY) had any impact on preferences. The results for PLANNING HORIZON's relationship to past-performance metrics largely confirm the earlier findings that investors with longer planning horizons pay less attention to these measures. Surprisingly, we found no evidence that investors with longer planning horizons place increased emphasis on expense ratios relative to loads. Clearly, if investors had a sound understanding of the actual cost of annual expense ratios, it is hard to imagine that this result would continue to hold. In many ways this result is a powerful testament, even stronger than the bias documented earlier, to the relative ignorance of investors with regard to reasonably evaluating mutual fund fee structures.

It is notable that the attribute COMPANY takes on a significantly increased importance for these longer-horizon investors as well. I speculate that brand familiarity may inspire confidence in an investor who plans to part with his or her money for a long period of time relative to an unknown brand (i.e., Pecunia). Much like banks that build austere structures with well-manicured grounds to help convince us of their safety and financial strength, a well-known brand name may assure potential long-term investors that their money will indeed be returned to them perhaps decades from the time of the investment decision.

Taken in totality, these results cast doubt on many preconceptions of what constitutes a "savvy" investor. In particular, knowledge of popular finance concepts seems to accomplish little in the way of steering investors toward

better decision making in the market for mutual funds. I comment on the implications of these findings and those discussed earlier in the next section.

III.   Managerial and Regulatory Implications

The results of this research speak directly to the pricing decisions of fund managers. First, taken in aggregate, consumers avoid loads. Mutual fund managers should look to other sources of fee-based revenue to increase the profitability of their funds. Second, consumers who have a greater knowledge of basic finance are particularly averse to loads, while those with less knowledge are less averse. Since loads are often associated with shares sold through a broker network, while no-load funds are generally sold through a direct channel, this offers an opportunity for fund managers to tailor their distribution and pricing strategies for a given fund toward investor groups most likely to be attracted to that fund. For example, a mutual fund that invests primarily in tax-free municipal bonds might intrinsically appeal to consumers with an above-average knowledge of basic finance. Since this pool of consumers is likely to avoid loaded funds, a company marketing such a fund might reasonably conclude that the added benefit of selling the fund as a no-load fund through a direct channel, and not attempting to increase distribution by contracting a broker network, outweighs the more limited distribution a direct channel would yield. The ability to offer different price structures to different consumers points to an increasing need for mutual fund managers to know the profile of consumers to whom their fund shares are typically sold.

Government regulatory agencies are keenly interested in how individual investors make decisions in this rapidly growing marketplace. Recent SEC rule making has focused on making the information that mutual funds publish in their prospectuses more accessible to the average investor. For example, SEC Rule 421(b), commonly called the "plain English" rule, requires mutual fund companies to write their prospectuses using less technical language, while SEC Rule 498 allows mutual fund companies to develop a shorter, more graphical, prospectus (profile prospectus) that they may substitute for the standard prospectus at the request of the potential customer.[20] These new rules, and additional rules that are currently under consideration, are directly aimed at reducing the ambiguity surrounding product choices in this marketplace. Current SEC rule making does not address the manner and format in which the complex fee structures of mutual funds are disclosed.

My research suggests that the current disclosure requirements are inadequate to guide investors toward reasonable decision making. Current requirements appear deficient in instructing investors about the ability of past performance to predict future performance as well as the required information format for fee disclosure. With regard to instruction about past performance, current

20. See *The Plain English Handbook* (1998).

law requires the familiar disclaimer "past performance is no guarantee of future returns." This is a weak statement in light of evidence from the finance literature. A statement along the lines of "past performance is no indication of future success whatsoever" appears more in line with the reality of the situation.

Investors appear to make substantial cognitive errors when evaluating a fund's fee structure. Disclosure requirements that allow greater transparency into the total cost of owning the shares of a mutual fund would likely lead to better investment decisions. Seemingly small differences in fees can lead to very substantial differences in total asset value over time horizons of 2 or 3 decades. Given that mutual funds are popular investment instruments for retirement savings accounts, these long-horizon effects are important. This problem becomes particularly acute under the often discussed scenario of a partially privatized Social Security system in which more individuals would exercise a greater degree of control over their retirement accounts and ultimately their returns. If the U.S. Social Security system moves in this direction, it would be beneficial to direct resources into developing fee information disclosure formats that make the true long-term cost of mutual fund ownership accessible and vivid to investors.

Finally, the research indicates that the people who are particularly vulnerable to making poor decisions are not those one would intuitively expect. Indeed, highly educated consumers and those who demonstrated greater knowledge of basic finance made poorer, not better, decisions than their less financially savvy counterparts. This suggests that investor education efforts might effectively be targeted toward media patronized by individuals with an interest in investing. While placing public service advertisements on television programs such as *Wall Street Week* and *Moneyline* might appear to target a segment of the population that does not need such information, my research indicates that these are exactly the individuals who need it the most.

IV. Limitations and Directions for Future Research

My research is limited by four important factors. First, I have had to adopt an experimental approach to generate the utility estimates of interest. Access to panel data on mutual fund choices would provide results based on actual instead of experimental choices. Panel data would also allow me to more fully develop a model of consumer behavior. I hope that in the future such data will be available to researchers. Second, my experimental results would have almost certainly been stronger if I knew the discount rate and expected holding time of each of the participants. This would have allowed a more formal individual-level inquiry into the fee bias phenomenon. Given the structure of the conjoint experiment, I believed that there was no accurate way to capture these measurements at the individual level. Third, the attributes chosen for the conjoint study were specified exogenously by me. This was a direct result of the stated goal of the research to examine the role of past performance

and fees in mutual fund choice. It is also reflective of the limitations of choice-based conjoint analysis. A procedure that formally elicited the important attributes of fund choice prior to the conjoint analysis may have uncovered additional important attributes not considered here. Finally, except for microeconomics, I have little formal theory to guide me to the decisions that consumers "should" be making in this market.

Ongoing research in the area of mental accounting, or how consumers evaluate and code financial events, holds promise for developing the theoretical underpinnings that would allow researchers to more formally evaluate the results set out in this research. For example, it is possible that front-end loads are mentally coded as immediate losses while ongoing management fees are coded as small detractions from the larger gain of the fund return (Kahneman and Tversky 1979; Thaler 1985). A prospect theory–type utility framework might at least partially explain why front-end loads are weighed more heavily than what one would expect. These kinds of coding tendencies, and the inherent behavioral anomalies that flow from them, may be useful in explaining why strict economic optimization organizes the observed behavior poorly.

The results obtained for this study lead to broader questions about pricing. Given that the market for financial services is often characterized by products that have complicated fee structures, how do consumers evaluate the different components of these fee structures? If consumers systematically overweight some components of the fee structure and underweight others, what are the mental heuristics that consumers are using to come to their decision? I believe these questions are not only of academic interest but have important business practice and public policy implications as well. Finally, marketing researchers have long studied how consumers make decisions in the market for frequently purchased packaged goods (i.e., grocery products). An understanding of consumer decision making in these markets has become quite mature. The market for investment instruments provides exciting new challenges to the field. In this marketplace consumers regularly make decisions that will affect their ability to retire, to send their children to college, to purchase a home, as well as many other contingencies about which people care a great deal. So little is known, yet the business practice and public policy implications resulting from an increased knowledge of consumers' decision processes in this marketplace are truly substantial. I hope that this research is only a first step in that direction.

Appendix A

Distributional Assumptions

1. $P[\text{Choice}_{ij}] = [\exp(\beta_i X_{ij})/1 + \exp(\beta_i X_{ij})]$.

2. $\beta_i \backsim N[(\overline{\beta}_0 + \overline{\beta}_1 D_i^1 + \overline{\beta}_2 D_i^2 + \overline{\beta}_3 D_i^3 + \overline{\beta}_4 D_i^4 + \overline{\beta}_5 D_i^5), \Sigma]$, where $D_i^1 \ldots D_i^5$ are the five demographic variables used in this study, and $\overline{\beta}_0 \ldots \overline{\beta}_5$ are each 32-dimensional (number of attribute levels) coefficient vectors.

3. $\overline{\beta}_0 \ldots \overline{\beta}_5 \backsim N[\gamma_0, V_0]$, where γ_0 and V_0 are prior hyperparameters.

4. $\Sigma \backsim \text{InvertedWishart}[g_0, G_0]$, where g_0 is a constant prior parameter and G_0 is a 32-dimensional diagonal prior matrix.

Full Conditional Distributions

1.

$$\pi[\beta_i | \overline{\beta}, D_i, \Sigma, \{X_{ij}\}] \propto \left\{ \prod_{j=1}^{63} \left[\frac{\exp(\beta_i' X_{ij})}{1 + \exp(\beta_i' X_{ij})} \right]^{I_{ij}} \right\} x \exp\left\{ -\frac{1}{2}(\beta_i - \overline{\beta}D_i)'\Sigma^{-1}(\beta_i - \overline{\beta}D_i) \right\},$$

where $I_{ij} = 1$ if profile j is chosen by person i, and zero otherwise.

$$\overline{\beta} = [\overline{\beta}_0, \overline{\beta}_1, \overline{\beta}_2, \overline{\beta}_3, \overline{\beta}_4, \overline{\beta}_5],$$

and

$$D_i = \begin{bmatrix} 1 \\ D_i^1 \\ D_i^2 \\ D_i^3 \\ D_i^4 \\ D_i^5 \end{bmatrix}.$$

Define

$$C_{-ki} = \sum_{m=0}^{5, m \neq k} \overline{\beta}_m D_i^m,$$

where D_i^0 is a 32-dimensional unit vector.

2.

$$\pi[\overline{\beta}_k | \{C_{-ki}\}, \Sigma, \gamma_0, V_0, \{\beta_i\}] \backsim N(\gamma_{k0}, V_{k0}),$$

where

$$\gamma_{k0} = \frac{\gamma_0 V_0^{-1} + \left\{ \sum_i (\beta_i - C_{-ki}) D_{ki} \right\} \Sigma^{-1}}{V_0^{-1} + \sum_i \left\{ (D_{ki})^2 \right\} \Sigma^{-1}}$$

and

$$[V_{k0}]^{-1} = V_0^{-1} + \sum_i \left\{ (D_{ki})^2 \right\} \Sigma^{-1}.$$

3.

$$\pi[\Sigma | \{\beta_i\}, \overline{\beta}, \{D_i\}, G, g] \backsim \text{InvertedWishart}\left[\left\{ \sum_i (\beta_i - \overline{\beta}D_i)(\beta_i - \overline{\beta}D_i)' \right\} + G_0, 50 + g_0 \right].$$

Appendix B

Finance Quiz

To help us determine your knowledge of mutual fund investing, we have devised the following short quiz. Please answer the following 10 questions by circling the letter corresponding to the answer you believe is correct. You may be assured that your performance on this quiz will be used solely for research purposes, and no information about your performance will be provided to anyone not directly involved in this research.

1. If interest rates rise, the price of a bond fund will
   a) Rise
   b) Fall
   c) Remain the same

2. A stock fund's beta rating can best be described as
   a) A measure of the relative performance of the fund versus the S&P 500 index
   b) A measure of the relative volatility of the fund versus the S&P 500 index
   c) A measure of the relative growth of the fund versus the S&P 500 index
   d) A measure of the relative capital outflow of the fund versus the S&P 500 index

3. The long-run historical average return for U.S. common stocks is about
   a) 10%
   b) 15%
   c) 20%
   d) 25%

4. A mutual fund's capital gains distribution can best be described as
   a) The interest and dividends earned by a fund's securities
   b) The gain you earn when you sell fund shares for a profit
   c) The cost of operating a mutual fund, expressed as a percentage of net assets
   d) The payments to shareholders of profits from the sale of securities in the fund's portfolio

5. A Rule 12b-1 fee is
   a) A charge incurred at the time you initially purchase fund shares
   b) A fee for reinvesting fund dividends
   c) A fee charged against the fund's assets for distribution and marketing related expenses
   d) A charge incurred to cover the management and administrative costs of the fund

6. A money market mutual fund is guaranteed by the U.S. government against principal loss.
   a) True
   b) False

7. If you invest in a bond mutual fund with an average maturity of 5 years, this means that you cannot withdraw your money from the fund within a 5-year period without incurring a penalty.
   a) True
   b) False

8. The income provided by a stock mutual fund is free from federal income tax.
   a) True
   b) False

9. Market risk is the potential for a decline in the value of an investment.
   a) True
   b) False

10. All other things being equal, the lower the fees charged by a mutual fund, the higher its return.
   a) True
   b) False

Appendix C

Standard SEC Disclosure

Expenses and fees:
   Sales commission to purchase shares (LOAD): 2%
   Investment management fee

Example:
   Assuming a 5% annual return and redemption at the end of each period, the total expenses related to a $1,000 investment would be

1 Year ($)	3 Years ($)	5 Years ($)	10 Years ($)
41	84	129	255

This example assumes reinvestment of all dividends and distributions and that the total fund operating expenses listed about remain the same each year. This example should not be considered a past or future example of expenses. Actual expenses vary from year to year and may be higher or lower than those shown.

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