Psychological Processes in Financial Decision-Making: a Consumer Perspective

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Many important financial decisions hinge on a proper understanding of compound interest. In three experiments, we explored the psychological underpinnings of consumer estimation of compound interest. Specifically, we examined the effects of negative vs. positive framing (i.e., debt vs. investments), differences between retrospective and prospective compounding, and the effects of financial expertise on accuracy. Results revealed that most people anchor on simple interest, resulting in enormous errors. A small subset of very accurate subjects used the “rule of 72." A short training procedure debiased consumers by teaching the rule of 72. These results have consequences for major financial decisions. Choosing for the Long Run: Making Tradeoffs in Multi-period Borrowing

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This paper extends the research on intertemporal choice by asking how attributes other than discount rates influence multi-period borrowing decisions. Both normative and behavioral models of intertemporal choice have assumed that consumer choices are driven by an individual discount rate. However, I hypothesize that consumers often choose between loans in a way that is inconsistent with both the normative economic and behavioral models of discounting. A set of three studies is presented that examine choices between loan payment schedules to determine whether people are attending to interest rates or to other attributes when choosing between loans.

Investors Can’t Choose Their Fund and Feel Good, Too

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Perceptions of relative skill are important when consumers decide if they can make their own choices or if they need expert assistance. We explore the effects of outcome (positive or negative) and agent (self or expert) on perceptions of relative ability and satisfaction. We find that the expert is rated as more able when the outcome is good and less able when the outcome is bad: Expert’s choice outcomes are scrutinized more than the choice process. When choices are made for oneself, however, the outcome does not matter: Participants rate their ability the same no matter what the choice outcome.

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SPECIAL SESSION SUMMARY
Psychological Processes in Financial Decision-making: A Consumer Perspective
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ABSTRACTS

“Intuitive Compounding: Framing, Temporal Perspective, and Expertise”
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Many important financial decisions hinge on a proper understanding of compound interest. For example, decisions on how much and when to invest in a 401(k) plan, whether to refinance a loan, or how to trade off various attributes of a loan instrument (rate, points up front, duration, etc.), cannot be made without a proper understanding of compounding. Furthermore, some judgments that enter into assessments of well-being and happiness, such as whether prices or wages are fair (cf., Bolton, Warlop, and Alba 2003), also depend on a proper understanding of compounding.

When consumers approach such decisions, however, their understanding of this critical concept is frequently quite poor. This problem is exacerbated because the geometric nature of compounding is counter-intuitive even to those who are intellectually familiar with the underlying theory. Furthermore, to accurately choose an option in many of the financial domains outlined above would require substantially greater spreadsheet modeling expertise than is possessed by the vast majority of consumers, which means that there will frequently be a substantial intuitive component to consumer decision-making in these domains.

A limited number of studies (e.g., Wagenaar and Sagaria 1975; Wagenaar and Timmers 1979) have investigated people’s ability to intuitively predict the outcome of an exponential growth process. Most of these experiments were conducted in unfamiliar domains (such as the growth of duckweed on a pond) rather than in the more familiar financial domain. An unfamiliar domain is likely to reduce the ability of participants to transfer any expertise that they might possess—an effect that has been demonstrated repeatedly in other tasks (e.g., the Wason 1968 card task). Furthermore, previous studies have not specifically looked for expertise effects or examined heterogeneity in the psychological process used to make decisions.

In three experiments, we explored the psychological underpinnings of consumer estimation of compound interest in a heterogeneous population. In particular, we examined differences in processing arising from negative vs. positive framing (e.g., debt, loans, and inflation vs. interest, raises, stocks), and in differences between retrospective and prospective compounding estimation (i.e., what was the cost of a TV in 1970? vs. what will be the cost of a TV in 2030?). Furthermore, we examined the effects of expertise and training on accuracy. The normative theory is simple: given an interest rate, i, and a time horizon, t, the formula governing compound interest is $FV=PV(1+i)^t$, where $FV$ and $PV$ are, respectively, the future value and present value of the investment, $i$ is the interest rate, and $t$ is the term.

Results demonstrated that the vast majority of people anchor on simple interest (i.e., $FV=PV[1+i/t]$), and then adjust their answer upwards. Reliance on simple interest was demonstrated both by analysis of participants’ open-ended responses and by the pattern of coefficients of individual-level models that were fit to respondents’ estimates. Anchoring on simple interest yielded acceptable accuracy for short time periods and for low interest rates, however, massive underestimation resulted for longer time horizons and for higher rates. Most of the major financial decisions that people make during their lives involve either long time periods (e.g., retirement saving, mortgages) or high interest rates (e.g., taking on credit card debt), which makes anchoring on simple interest a pernicious bias. Additional results demonstrated that all respondents found retrospective estimation (i.e., if there are $FV$ dollars in the account today, what $PV$ was invested $n$ years ago at a constant interest rate, $?/?) more difficult than prospective estimation.

Although most participants used simple interest as an anchor and were very inaccurate, a small minority were very accurate in their estimates. Open-ended responses and individual level coefficient estimates revealed that these subjects used a completely different estimation process, the “rule of 72.” The rule of 72 is an accurate approximation of the correct financial formula, the core of which is the realization that $72/i$, where $i$ is the number of years that it takes for money invested (or loaned) at an interest rate of $i$ to double in value. If the time horizon is known, the rule of 72 can be used to approximate the effects of compounding by computing the number of doublings implied by $(i, t)$, and then doubling the principle that number of times. For example, if $PV=1,000$, $i=9\%$, $t=24$ years, then an exact computation shows $FV=8,791$. To use the rule of 72, compute $72/9=8$, which demonstrates that money at 9% will double in approximately 8 years. Since the time horizon is 24 years, this represents 24/8=3 doublings, which will result in a $FV=2^3 \times 1,000=8,000$ (error=1%). Note that simple interest would provide an anchor of $FV_{SI}=1,000 + 9\% \times 24=2,160$ (error=72%).

In Experiment 3, we trained participants to use the rule of 72. Compared to an untrained control group, the trained condition realized enormous improvements in accuracy, with no increase in time spent on the task.

Expertise in estimating compound interest is strongly linked to the use of the rule of 72. If consumers anchor on simple interest, they are likely to make errors that have massive impact on their financial well being, including underestimating the cost of long-term loans (such as mortgages), saving too little and too late for retirement, and allowing credit card debt to revolve, rather than aggressively paying it down. Furthermore, the results shed light on the difficulty of learning nonlinear functions, even for those with substantial experience with them. Consumers can be taught to be considerably more accurate in their understanding of compounding in a very short amount of time.

References
“Choosing for the Long Run: Making Tradeoffs in Multi-period Borrowing”  
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Both basic economics and popular wisdom imply that consumers should be sensitive to interest rates when making decisions about borrowing and saving. Consumers assume that lower interest rates are always better, all other things held equal. For example, credit cards regularly compete for business by advertising that they charge interest rates below other cards that the consumer might currently hold. However, examples abound in which consumers choose loans with unreasonably high interest rates, such as products at payday loan stores that can charge interest at annual rates of several hundred percent. Public concern about this tendency for making unwise borrowing choices has resulted in Truth in Lending laws, which require lenders to explicitly state annual interest rates (APRs) for loans regardless of the length of the loan. Yet even with these corrective measures in place, consumers continue to borrow at rates which seem inconsistent with rational behavior.

These inconsistencies may lead us to wonder whether consumers really do pay attention to interest rates when making borrowing decisions. Although borrowers may believe that lower rates are better, their final loan choice may be inconsistent with this belief when other aspects of the loan, such as time schedule and per period payment amount, are changed. One explanation for this inconsistency between beliefs and actual choice is that consumers choose between loans based on attributes other than interest rates, such as the total payment amount, the length of the loan, or the size of the individual payments (even when controlling for budget constraints). This could imply that consumers’ sensitivity to interest rates can be exaggerated or muted by the extent to which a change in rates affects these other attributes, such as the total payment amount.

In this paper, I hypothesize that consumers often choose between loans in a way that is inconsistent with both the normative economic model and the behavioral model of discounting. To test this hypothesis, a series of three studies is conducted that asks participants to choose between hypothetical loan schedules. The first study asked participants to repeatedly choose between pairs of loan schedules which differed in length, monthly payment, and annual percentage rate (APR). Since potential borrowers may be using one of several rules of thumb in choosing between loans (e.g., choosing based on total payment, timeframe, per period payment, or APR), pairs of choices were constructed to check for each alternative heuristic. Participants’ responses were categorized based on these possible choice heuristics; results indicate that most subjects are consistently choosing the loan schedule with the lowest total payment amount. The second study involved a ranking task, in which participants order a set of eight different loans; the results of this study give us insight into how the various attributes of each loan are traded off. An ordered logit analysis of the data suggests that participants are using a model that puts weight on the rank (and not the absolute value) of several attributes other than interest rate. The third study mirrors Study 1 for positive outcomes (lottery winnings) rather than payments, to investigate whether the attributes that characterized the loan choices would receive similar weight in a gain situation. Results suggest that subjects do switch their emphasis to a different attribute (i.e., to monthly amount rather than total amount) when considering positive streams of payments.

Taken together, these three studies show that, when choosing between loan options, decision makers focus on loan attributes other than APR. This approach differs from previous work in this area since it suggests that people are not using any model of discounting (normative or behavioral), but are instead using simpler decision strategies (and yet not as simple as just choosing based on lowest APR, which may be the simplest strategy of all). Explanations for the use of these decision strategies may center on a combination of salience, reference points, and temporal bracketing. For example, a theory of reference points predicts that people will react differently when total interest cost is large relative to the original price (as it is in the case of a long loan, such as a mortgage) versus when interest cost is small relative to the original price (as it is for a payday loan). This focus on total payment (or, equivalently, amount of interest) may be stronger than the focus on interest rates for some consumers because the concept of an interest rate is intangible for many consumers. They may interpret interest costs as a penalty assessed by the lender rather than as a way of calculating the time value of money. Thus, even in cases where a consumer can directly compare loans based on APR, interest rates may have some influence, but the total payment amount will also still be taken into account (as the results of Study 2 demonstrate).

An additional implication of this work is its predictions for demand elasticities of interest rates. If consumers are indeed more sensitive to attributes other than APR when considering loans (such as total payment amount), then this will result in a greater sensitivity to interest rates on long term loans, such as mortgages. In other words, the elasticity of demand for rates will be higher for long term loans than for short term loans. Empirical work on loan choices has already noted this result. For example, Attanasio (1994) studied vehicle loans and tried to determine what factors influence borrowing. His empirical findings are consistent with the hypothesis of this paper, in that attributes other than interest rate influence loan choice. Determining these behavioral influences on consumption and savings patterns remains a rich area of future work.

References

“Bursting Another Financial Bubble: The Influence of Ability Perception on Choice Satisfaction”  
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Prior research has shown that consumers prefer to make a personal choice rather than having the same choice dictated to them even when they are not more satisfied as a result of their own choice (Botti and Iyengar 2004). How can we explain consumers’ preference for choosing in spite of their subsequent satisfaction? It has been found that people generally believe that they will outperform others (Alba and Hutchinson 2000). For example, most investors view their ability to select investments as superior to the average investor’s ability (Moore, Kuzitrg, Fox, and Bazerman 1999; Wood 1997). The same positivity bias may therefore cause consumers to believe that they can make better choices than anybody else, explaining their general aversion to relinquishing choice. This positivity bias extends even to judgments made about others (Klar and Giladi 1997), suggesting that, when estimating someone else’s ability to make good choices, people will overestimate their performance as well.

Although this positivity bias in estimates of relative abilities has proven to be quite robust, prior findings suggest that people may be unable to maintain optimistic self-assessments given information about the context of their performance. Research shows that people are likely to apply situational explanations to their own outcomes (Jones and Nisbett 1972). However, people have been also shown to ignore situational information in favor of disposi-
tional explanations for others’ outcomes (Jones and Nisbett 1972). Hence, it might be hypothesized that in decision-making contexts in which consumers have access to situational feedback about the quality of their decision outcomes, assessments about one’s own comparative abilities are more prone to positive illusions than assessments about others’ comparative abilities. In this paper, we investigate the impact of situational feedback on estimates of relative investing abilities in a context where situational feedback is often available—investment decisions. For example, newspapers provide investors with information about the valence and degree of their own investment outcome, about how this performance compares to those of other investors, and about the performance of the market as a whole. Because people tend to incorporate this type of feedback only into evaluations of their own outcomes, we suspect that people’s evaluations of their own comparative investing abilities, but not of another’s, will be reduced.

We investigate the impact of situational feedback on estimates of relative investing abilities by comparing a situation in which the performance of a selected mutual fund was positive to one in which the performance was negative. Each investment outcome was carefully framed within a set of alternatives that also went up [down], on average, the same amount as the selected fund. Thus, each outcome was always an average outcome. Nevertheless, we predicted that, when the investment was chosen for participants by a third party (e.g., a broker), consumers would attribute the decision outcome to the skills of that broker—a dispositional explanation; conversely, when the investment was chosen by themselves, consumers would attribute the decision outcome to the situational factors (the market). As a result, in a bull market, investors would assess their relative ability following a gain as less stellar than the broker’s relative ability. However, in a bear market, investors would judge themselves as less incompetent after a loss than the broker.

We tested this hypothesis in a 2 (self-choice/broker-choice) by 2 (positive outcome/negative outcome) between subject experiment. Participants evaluated the results of a mutual fund that they had either personally chosen or that has been chosen for them by a broker. In the positive outcome condition the mutual fund gained value along with all 3 alternative funds. In the negative outcome condition the fund lost value along with all 3 alternative funds. Results show that participants wanted to choose their mutual fund even though they were on average more dissatisfied with the funds’ performance in the self-choice than in the broker-choice condition. When the selected mutual fund gained value, self-choosers’ pre-occupation with the situation prevented them from inflating their relative investing ability. Because both the selected and the alternative funds went up, on average, the same amount, choosers considering all the information provided could not maintain an optimistic view of their ability relative to average peers as they had not outperformed the market. However, the broker’s choice was under much less scrutiny and as a result the broker was rated as more able than the average broker despite the fact that he had merely matched the average market performance. Participants were also most satisfied with the positive outcome that resulted from their broker’s choice than with the same outcome when they chose it. A mediational analysis showed that this satisfaction was a direct result of the participants’ perceptions of comparative abilities.

In conclusion, though consumers want to make their own choices, in those contexts that qualify decision outcomes with situational information, consumers’ tendency to temper their own performance with situational information can lead them to view themselves as relatively unskilled choosers. However, consumers’ attribution of dispositional factors to others’ outcomes causes them to perceive third parties making a choice on their behalf as relatively skilled. These disparate perceptions of ability have a direct consequence in outcome satisfaction: low perceptions of ability lead to low satisfaction while higher perceptions of ability lead to higher satisfaction. Thus, participants are ultimately more satisfied with positive results when they do not make their own choices. These results suggest that consumers’ optimism about their own abilities can be tempered to an extent that they are actually unbiased in their self-assessments when situational information is available. Furthermore, these findings imply that consumers may not be sufficiently critical of the performance of experts. So, when evaluating the performance of an expert hired to make decisions such as a financial advisor, consumers may unnecessarily attribute positive performance to the skills of that expert.

References


