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## **Debt Aversion: Anomalous in Theory, Advantageous in Practice**

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Attitudes towards debt critically influence a variety of financial behaviors. We show that debt aversion is associated with negative discounting for losses, the gain-loss asymmetry and other anomalous behavior. In contrast, a field study shows that debt aversion has advantages: individuals reporting higher debt aversion have better credit scores.

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# Biases in Consumer Financial Decision Making

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## Paper #1: Better Understood Companies Seem Like Safer Investments

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## Paper #2: Debt Aversion: Anomalous in Theory, Advantageous in Practice

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## Paper #3: Judgments Based on Stocks and Flows: Different Presentations of the Same Data Can Lead to Opposing Inferences

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## Paper #4: Leaving Money on the Kitchen Table: Exploring Sluggish Mortgage Refinancing Using Administrative Data, Surveys, and Field Experiments

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### SESSION OVERVIEW

The financial decisions consumers make are increasingly complex and important for their financial welfare. For instance, consumers now decide whether to finance a purchase on any of several credit cards that vary along interest rates, reward structures, grace periods, and potential fees. Consumers decide which investments fit their risk tolerance, despite widespread misunderstanding of how financial risk works (Reinhold, Fernbach, and de Langhe 2016). Consumers also make decisions about mortgage refinancing not only in light of the complexities of the loans, but also in light of predatory lending practices (Bond, Musto, and Yilmaz 2009). Financial decisions like these present challenges to decision-makers; they usually involve a time component, trading off current desires for future necessities, and reasoning about complex, nonlinear relations (e.g., compounding: McKenzie and Liersch 2011; stock-flow problems: Cronin, Gonzalez, and Serman 2009). To deal with such complexity, consumers mentally simplify the decisions. The papers in this session describe several ways consumers simplify, and show cases where the result is beneficial or detrimental to consumer welfare.

First, Long, Fernbach and de Langhe find having a high understanding of what a company does leads people to perceive the company's stock as being less risky. They also find understanding is unrelated to the true risk of a stock, indicating the bias leads to consumers making investments that do not match their risk preferences. Second, Walters and colleagues investigate a novel individual difference – debt aversion. They find debt aversion is associated with several biases, such as negative discount rates for losses. However, in real-world decisions debt aversion can lead to an especially positive outcome – better credit scores. Third, Spiller, Reinhold, and Maglio find consumers tend to form opinions based on the direction of a trend regardless of whether the same information is presented as a stock (e.g. asset price over time) or a flow (e.g. rate of return over

time). For instance, if an asset's price is increasing at a diminishing rate, when presented as a stock the direction is positive, and people tend to think the price will keep increasing. When presented as a flow, the direction is negative, and people tend to think the rate of change will continue, and the stock's price will soon decrease. Finally, Johnson, Meier, and Toubia find consumers overwhelmingly do not accept beneficial mortgage refinance offers. Consumers' high suspicions about financial institutions' motives lead to decreased offer acceptance.

These papers seek to answer not only how consumers simplify the complex decisions they face, but also how these heuristics affect the quality of decisions. The session will be a great opportunity for students interested in the burgeoning field of consumer financial decision-making to get a good sense of the topics and methods researchers are tackling. The papers present a variety of methodologies from laboratory experiments to secondary-data analysis to field experiments, and they deal with a range of substantively important topics like debt accumulation, investing, and mortgage refinancing. They also cover a broad theoretical range from basic psychological processes to actual consumer behavior in the marketplace.

## Better Understood Companies Seem Like Safer Investments

### EXTENDED ABSTRACT

Investment experts often advise people to invest in companies that they understand. This can be a beneficial strategy, because a consumer may have local knowledge other investors do not have, allowing the consumer to make a better valuation of the company (Hayek 1945). However, this rationale means that understanding is merely a starting point – the first step in determining a company's value. Unfortunately, consumers often misinterpret the experts' advice, thinking companies they understand are safer to invest in.

Prior research has found that sense of understanding influences preference formation (Hadar and Sood 2014; Fernbach, Sloman, St. Louis, and Schube 2013; Hadar, Sood, and Fox 2013). Our research shows that a person's sense of understanding influences preferences by impacting risk perceptions. When people feel they understand what a company does, investing in that company feels safer. While sense of understanding may be a valid indicator of risk in some domains, it is not in the financial domain. Thus relying on sense of understanding to guide investment decisions leads to suboptimal choices.

### Study 1a

We presented 248 participants with ten company descriptions, sampled randomly from the S&P 500. Each participant read the company's profile from Yahoo! Finance, and rated how risky investing in the company was, how well they understood what the company does, and how familiar they were with the company. Participants completed the epistemic and aleatory risk scale (Ears; Fox, Tannenbaum, and Ulkumen 2016). Ears measures the degree to which a person believes an event's outcome is knowable in advance, given enough information (epistemic) versus completely random (aleatory). Finally, we computed each stock's capital asset pricing model (CAPM) beta statistic, which is an objective measure of a stock's risk.

As predicted, companies rated as higher in understanding received lower risk ratings ( $r = -0.31, p < .001$ ). However, understand-

ing did not correlate with objective risk ( $r = -0.06, p > .23$ ). Regression analyses indicate that the relationship between understanding and risk is robust ( $\beta = -0.12, t(475) = -2.74, p < .007$ ) after controlling for differences in familiarity, objective risk, or aleatory/epistemic risk judgments.

### Study 1b

We presented 335 participants with four company profiles, sampled randomly from the S&P 500. Instead of rating risk on a seven-point scale, participants completed a distribution builder task in which they constructed a histogram by assigning 100 balls to 11 bins that represent possible rates of return for the stock. From the participant's distribution, we calculate several statistics including the mean rate of return and standard deviation. Participants also rated other covariates as in 1a and we calculated objective risk statistics.

We used the standard deviation as a proxy for perceived risk due to its long history of representing risk in mean-variance models of investing (Markowitz 1952). Again, we found that higher understanding is related to lower risk perceptions ( $r = -0.19, p < .001$ ) and that this relationship remains significant when controlling for other measured variables ( $\beta = -0.23, t(446) = -4.26, p < .001$ ). We also analyzed participants' mean expectations for stock returns. Participants estimated higher average returns for higher understanding companies ( $r = 0.16, p < .001$ ), and the result remained significant when controlling for the other variables ( $\beta = 0.26, t(446) = -2.99, p < .003$ ). The effects of understanding on perceived standard deviation and mean of the outcome distribution is consistent with previous research connecting risk perception both to uncertainty and to the likelihood of bad outcomes (Slovic 1987).

### Study 2

Studies 1a and 1b established across a broad range of companies that people perceive less risk in companies that they understand better. In study 2, we manipulate understanding by providing participants with structured versus unstructured information about companies. In the structured condition, participants examined a table containing divisions of the company in one column and what that division produces or sells in the second column. In the unstructured condition, participants received the same information, except the table was split in two, such that participants could not directly match a division with what it produced or sold. Pretests indicated that the structured condition had higher ratings of understanding for companies that were rated as easy to understand in studies 1a and 1b, but had the opposite effect for companies rated as hard to understand in studies 1a and 1b ( $f(1, 198) = 16.42, p < .001$ ). In the main study, we measured ratings of risk on the same 7-point scale as study 1a, and found that for companies that were rated as easier to understand in studies 1a and 1b, structure caused lower risk ratings ( $t(199) = -3.67, p < .001$ ). For companies that were rated as harder to understand in studies 1a and 1b, structure caused higher risk ratings ( $t(199) = 3.13, p < .001$ ).

### Study 3

In study 3, we investigate how sense of understanding impacts portfolio composition. Participants were asked to allocate \$10,000 to stocks to create a portfolio for a hypothetical client. Participants were randomly assigned either a client described as having a high risk-tolerance or a low risk-tolerance. Participants were shown three company profiles rated as easy to understand in previous studies and three rated as difficult to understand. If sense of understanding is negatively correlated to risk in people's minds, participants in the low risk-tolerance condition should allocate more money to well-un-

derstood companies and participants in the high risk-tolerance condition should allocate more money to poorly understood companies. In line with these predictions, participants allocated a higher percentage of money to high understanding companies in the low risk-tolerance condition than high risk-tolerance condition ( $m_1 = 61\%, m_2 = 44\%, t(149) = 6.36, p < .001$ ).

Across several studies we show that risk perceptions are driven by consumers' sense of understanding about what a company does. However, sense of understanding is unrelated to the true riskiness of a stock. Reliance on sense of understanding as a cue for risk can thus lead people to select investments whose true level of risk mismatches their risk preference.

## Debt Aversion: Anomalous in Theory, Advantageous in Practice

### EXTENDED ABSTRACT

Casual observation suggests that people display varying attitudes towards debt. However, the traditional view of time preference is that people are prone to taking on debt, paying a premium to make payments later rather than sooner. In this paper we assert that debt seeking may not be as universal as standard discounting models assume. Even if people take on debt in practice due to liquidity constraints, they may treat debt as inherently unappealing. For instance, many people who pay off their balances in full each month prefer to make purchases by debit rather than credit card, even though using a credit card under these conditions is tantamount to an interest free loan (Zinman 2009).

In this paper we introduce a novel scale to measure general attitudes towards debt: the debt attitude scale (DAS), a 4-item measure of aversion to debt that we show can predict three anomalous intertemporal preferences in the lab: individuals higher in debt aversion are more likely to exhibit negative discount rates for losses, greater patience for losses compared to gains (the gain-loss asymmetry), and greater patience for borrowing compared to saving (the borrowing-saving asymmetry). Despite the fact that debt aversion predicts anomalous patterns of preference in the lab, in a field study we find that individuals who report higher levels of debt aversion actually have better credit scores.

The first anomaly, negative discount rates for losses, is the observation that many people prefer incurring a loss sooner rather than later and therefore require a premium to postpone making payments (Scholten et al. 2016; Yates and Watts 1975) so that measured discount rates are sometimes negative (Hardisty, Appelt, and Weber 2013). This finding, which contradicts standard economic analysis, might also be interpreted as an expression of debt aversion. Thus, we predict that explicit ratings of aversion to debt on our rating scale will be associated with a higher frequency of negative discount rates for losses in a generic intertemporal choice task.

The second anomaly, the gain-loss asymmetry (Loewenstein and Prelec, 1992), is the finding that people tend to be more patient when making decisions concerning future losses than future gains. For example, a person who is indifferent between gaining \$100 today and gaining \$120 one year from today will generally prefer losing \$100 today to losing \$120 one year from today. Our interpretation is that delayed losses or payments tend to be construed as debts, since they are obligations to pay money in the future, and that people who are debt averse will prefer to incur the loss as soon as possible. Thus, we predict that people who express more debt averse attitudes on the DAS will exhibit greater patience in a generic intertemporal choice task when assessing losses relative to gains (i.e., show greater gain-loss asymmetry in discounting).

A third, related anomaly, which we call the borrowing-saving asymmetry, is the observation that people's discount rates are typically lower for borrowing than saving (Prelec and Loewenstein 1998; Meissner 2015). We predict that because people with more debt averse attitudes discount future losses less than gains, they will generally have lower discount rates for borrowing (i.e., gaining money today in exchange for losing money in the future) than saving (i.e., losing money today in exchange for gaining money in the future).

Although debt aversion may be associated with "anomalous" behavior, in that it violates standard economic accounts of intertemporal discounting, it may nevertheless provide some advantage or protection to people making every day financial decisions. It is well known that people tend to be impatient, and seek to favor immediate over deferred gratification, which is often funded by unsustainable debt (e.g., running up credit card balances). An instinctive aversion to debt may serve as a restraint on such behavior and thus moderate any tendency to over-borrow.

In study 1 we find that debt aversion is associated with negative discounting for losses. Participants ( $n = 520$ ) first completed the debt attitude scale (DAS). Participants then completed a titration of discount rates for losses using a standard discount-delay task and a measure of loss aversion. We find that the majority of participants expressed debt aversion (i.e., responses above the midpoint of the scale). Participants reporting greater debt aversion on the DAS were more likely to express negative discount rates for losses, even after controlling for other factors such as loss aversion ( $p < .001$ ).

In study 2 we extended this result to show that debt aversion is associated with greater asymmetry in gain-loss discounting. Participants ( $n = 168$ ) completed the DAS and a titration of discount rates for both losses and gains. Participants higher in debt aversion tended to express lower discount rates for losses-vs-gains whereas participants low in debt aversion showed no difference across elicitations (interaction  $p < .05$ ).

In study 3 we find that debt aversion is associated with greater asymmetries in discount rate for borrowing versus saving. Participants ( $n = 313$ ) completed the DAS, a borrowing schedule titration, and a saving schedule titration. Once again, participants reporting greater debt aversion on the DAS tended to be more patient for borrowing (trading off an immediate gain against a larger looming loss), but not for saving (trading off an immediate loss for a larger looming gain), interaction  $p < .05$ .

Although debt aversion is associated with anomalous behaviors in the laboratory, we expected that it might confer some advantage in practice. In study 4 participants ( $n = 152$ ) completed the DAS, other individual difference measures, and gave consent to obtain their credit scores. We find that higher scores on the DAS are related to better credit scores, after controlling for demographic variables ( $p < .01$ ). Further, we find the DAS is a stronger predictor of credit scores than previously proposed attitude scales.

In sum, we develop a new, easy to administer attitudinal measure of debt aversion. We find debt aversion to be common. Further, debt aversion appears to serve as a useful heuristic for better financial decision making in the field, but leads to anomalous behavior in the lab.

## Judgments Based on Stocks and Flows: Different Presentations of the Same Data Can Lead to Opposing Inferences

### EXTENDED ABSTRACT

Prudent financial decision-making requires understanding how quantities change over time and how they might change in the future. Good investors should understand macroeconomic trends such as sales and job growth when deciding whether to enter a market. Families should understand their financial assets and liabilities before committing to expenditures or debt. Quantities that change over time can be presented in different ways. Here, we focus on two ways to present the same information: as a stock (e.g., wealth over time) or as a flow (e.g., income less expenditures over time). Although each format presents the same information, even well-educated adults have substantial difficulty translating between stocks and flows (Cronin, Gonzalez, and Sterman 2009; Sweeney and Sterman 2000; Sterman 2010). We find that presentation format (stock vs. flow) influences the judgments consumer make.

When making judgments, people heavily weight information that is made the most salient (Kahneman 2015; Slovic 1972; Tversky and Kahneman 1981; in graphical displays: Cleveland and McGill 1984; Lurie and Mason 2007). As a result, trends that are explicit influence judgments more than trends that must be deduced. Consider a \$1,000 bank account balance that increases to \$1,700, to \$2,100 and finally to \$2,200 with an implied flow of +\$700, +\$400, +\$100. One might judge the balance based on the stock trend (increasing) or the flow trend (decreasing). One common mistake is to conflate the two, inferring that stocks and flows track each other's patterns (Sweeney and Sterman 2000). Our results indicate that presentation format – and the apparent trend that varies by format – shapes consumer judgments.

### Study 1

100 participants were randomly assigned to view us employment data (2007-2013) as either a stock (number of private-sector jobs per month) or flow (number of private-sector jobs gained or lost per month). The most rapid job loss occurred around January 2009 when Barack Obama was inaugurated. The rate of job loss accelerated in the previous year and slowed (but did not reverse) in the year following his inauguration. Although they show the same data, the apparent stock trend during Obama's first year was negative and the apparent flow trend was positive.

When asked "in your view, what effect did Barack Obama have on the American economy during his first year in office?" (1 = "made it much worse," 7 = "made it much better"), flow participants reported that Obama had a positive effect ( $m = 4.84$ ,  $sd = 1.36$ ), whereas stock participants reported that Obama had a negative effect ( $m = 3.32$ ,  $sd = 1.61$ ;  $t(98) = 5.10$ ,  $p < .001$ ); each of these values significantly differed from the midpoint (4 = "made no difference,"  $ps < .01$ ). We do not claim whether one depiction better represents the economy, but rather that they lead to very different judgments.

### Study 2

402 participants were randomly assigned to make forecasts from each of 9 stock graphs or 9 flow graphs. These nine graphs came from a 3 (stock trend: negative, zero, positive) x 3 (flow trend: negative, zero, positive) design; domains and magnitudes were randomized across patterns. Consider the sequence (32, 41, 47, 50, 50) with the associated flow (+9, +6, +3, +0). This sequence has a positive stock trend (32 to 50) and a negative flow trend (+9 to +0). Par-

ticipants saw four years of monthly data and the ending quantity and made a forecast of what the quantity would be one year later.

Across the 9 patterns, the modal response reflected a linear extrapolation from the ending trend. In 5 cases, this trend had the same sign for stocks and flows, with the dominant response receiving 79% to 100% of responses. In the other 4 cases, forecasts followed the observed ending trend, which varied for stocks and flows. For example, for a positive stock / negative flow trend, the modal forecast in the stock condition was no change (41%) and the modal forecast in the flow condition was negative (94%). In each of these 4 cases, the distribution of signed changes varied by condition ( $p < .001$ ).

### Study 3

Are these differences due to an inability to comprehend the graphs? We selected the four cases with different ending trends from study 2, but calibrated the trends differently (e.g., the positive stock / negative flow trends were patterned (20, 32, 41, 47, 50) and (+12, +9, +6, +3), respectively). 605 participants were assigned to one of six conditions in a 3 (graph: stock, flow, stock+flow)  $\times$  2 (order: forecast then describe; describe then forecast) design. Participants in the stock+flow condition saw both graphs; their responses fell between the stock and flow participants and we do not discuss them further. The forecast task was like the study 2 task. The describe task asked participants to read and compute quantities from the graph rather than make a forecast of the future.

Aggregate results replicated study 2. Among the observations on which participants described the graphs correctly (42%; cf. Cronin et al. 2009), the differences persisted when flows trended upwards or downwards. For example, for a positive stock / negative flow trend, the modal forecast in the stock condition was positive (97%) but the modal forecast in the flow condition was negative (41%;  $p < .001$ ).

### Study 4

Study 4 tested whether the effect persists when data are displayed as a table. 401 participants were randomly assigned to one condition in a 2 (data: stock, flow)  $\times$  2 (display: graph, table) design. Each described and then made a forecast based on a positive stock / negative flow. Results replicated study 3. Even among participants faced with a table, the effect persisted among the 81% who read the table correctly. The modal forecast in the stock condition was positive (87%) but the modal forecast in the flow condition was negative (50%;  $p < .001$ ).

The decision to present data as stocks or flows, despite being formally equivalent, is not a neutral choice. Stark differences in judgment valence result from such differences, even among those who demonstrate a priori that they can accurately describe such graphs.

## Leaving Money on the Kitchen Table: Exploring Sluggish Mortgage Refinancing using Administrative Data, Surveys, and Field Experiments

### EXTENDED ABSTRACT

Refinancing is one of the most important financial decisions of households. Getting this decision wrong can be very costly for homeowners. Previous research does suggest that borrowers do not optimally refinance (see, e.g., Stanton 1995; Campbell 2006; Agarwal et al. 2012). The many borrowers who do not refinance when they should or do so sluggishly (referred in industry circles as “Woodheads”) potentially leave a lot of money on the table. Keys et al. (2014) estimate based on loan-level data that the median present-discounted cost of failing to refinance is about \$11,500. In

this paper, we take advantage of the home affordable refinance program (HARP), a setting that has multiple features that allow us to address these issues. First, we have detailed information about the offers sent to about 800,000 borrowers and then observe whether they refinanced through this program. Second, all those offers have no upfront costs – all prepayment penalties and appraisal costs are waived and provide substantial savings, suggesting that refinancing should be frequent. We ask 1) how much money do borrowers leave on the table by not accepting the refinance offers, and 2) whether heterogeneity in borrower’s preferences, attitudes, and/or financial sophistication can explain part of the refinance patterns. Finally, HARP refinancing is very lucrative for same-servicer refinancing as these loans are sold at a premium (see, p. 35 in Fuster et al. 2013). This allows the offerer to conduct several different (behaviorally informed) interventions to attempt to increase refinancing rates. Thus HARP provides us with a relatively unique setting in which many empirical problems are minimized.

The results show that only 16.23 % of the borrowers applied to the first refinance offer sent by the bank. While we observe refinance offers, we do not have information about other offers from competitors. However, we do know whether borrowers paid off their mortgage – which can be either through another refinance offer from our fi, by refinancing with a competitor or paying off the loan in full. Overall, 60.16% did not refinance. This is stunningly high given the fact that there are no monetary costs and that the pre-approved offers are attractive: on average, the interest rate drops by 1.8 percentage points (median: 1.75). Such a rate decrease would lead to a monthly savings of \$204 on average (median: \$122). If non-applicants had picked up the offer from the fi, they would have saved several thousand dollars over the life time of the mortgage. Our results show that many households leave substantial amounts of money on the table by not applying to the refinance offer. However, this does not mean that borrowers do not pay any attention to the offer because, on average, borrower react to the attractiveness of the offer in an expected way: the more attractive the offer (the greater decrease in interest rate) the more likely borrowers are to refinance. However, application rates increase only up to a certain point after which the application probability almost returns to the baseline level. Because borrowers react to the attractiveness of the offer, it appears that they at least looked at it.

We next investigated potential reasons for not refinancing by conducting a large-scale survey with a subset of borrowers. We match the answers to the survey to the administrative data. The responses suggest that part of the problem of sluggish refinancing is suspicion by borrowers of the motives of financial institutions. Apparently, refinance offers under the HARP program seem too good to be true for many borrowers. Households expect there to be hidden fees and cumbersome processes that are not compensated by the attractiveness of the offer. The evidence from the survey matched to the administrative data suggests that higher suspicion about the motives of financial institutions is robustly associated with lower application rates. In addition, we find that typical time preference parameters such as present bias and discount rates are significantly related to the refinancing decision. Present bias and discount rates (following Laibson (1997)) predict how sensitive borrowers are to the attractiveness of the offer (i.e., the interest rate decrease). At the same time, other psychological factors, like numerical ability, conscientiousness, and others seem less important in determining refinance decisions.

Our resulting set of field experiments demonstrates that barriers to refinancing are extremely difficult to overcome. For example, the literature suggests that financial incentives may nudge present-biased individuals into applying (see, e.g. Charness and Gneezy 2009;

Gneezy et al., 2011). Based on this logic, in one field experiment the fi offered an immediate benefit, i.e. gift cards of up to \$100, for applying. In another field experiment, the bank relied on a third-party (in our case, Fannie Mae and Freddy Mac) to increase the credibility of the program. Finally, in a third field experiment the bank committed to paying \$500 to the borrower if the process took more than 30 days. However, when borrowers are suspicious, they are likely to discount such interventions. If anything, these interventions might backfire, and borrowers become even more suspicious. Evidence from three large-scale field experiments (with more than 100,000 borrowers per experiment) indicates that these interventions have no effect on application rates. Offering gift cards, for example, has—if anything—a slight negative effect on application rates. In other words, interventions that try to tackle psychological barriers like present-biased preferences may not be effective when customers are suspicious.

This result sheds light on the question of how sustainable it is to exploit consumers' decision-making biases. If the suspicion of our borrowers was really shaped by the past behavior of the financial industry, then the resulting loss of trust has delayed costs in that it restricts the fi's ability to sell its products. As such exploiting behavioral bias in the short-run, might then have long-term costs in terms of increased suspicion. Indeed, the importance of trust (and the lack thereof) in guiding customer behavior has been well documented in marketing (Berry 1996; tax et al. 1998; Garbarino and Johnson 1999; Sirdeshmukh et al. 2002; Harris and Goode 2004), but neglected in finance.

## REFERENCES

- Agarwal, Sumit, Richard J Rosen, and Vincent Yao (2012). "Why do borrowers make mortgage refinancing mistakes?" Federal Reserve Bank of Chicago Working Paper.
- Berry, Leonard L. (1996). "Retailers with a future," *Marketing Management*, 5(1), 39–46.
- Bond, Philip, David K. Musto, and Bilge Yilmaz (2009). "Predatory mortgage lending." *Journal of Financial Economics*, 94(3), 412–427.
- Campbell, John Y. (2006). "Household Finance," *The Journal of Finance*, 61(4), 1553–1604.
- Charness, Gary and Uri Gneezy (2009). "Incentives to exercise," *Econometrica* 77(3), 909–931.
- Cleveland, W. S. and Robert McGill (1984). "Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods," *Journal of the American Statistical Association*, 79(387), 531–554.
- Cronin, Matthew A., Cleotilde Gonzalez, and John D. Sterman (2009). "Why don't well-educated adults understand accumulation? A challenge to researchers, educators, and citizens," *Organizational Behavior and Human Decision Processes*, 108(1), 116–130.
- Fernbach, Philip M., Steven A. Sloman, Robert St. Louis, and Julia N. Shube (2013). "Explanation Fiends and Foes: How Mechanistic Detail Determines Understanding and Preference," *Journal of Consumer Research*, 39 (5), 1115–1131.
- Fox, Craig R., David Tannenbaum, and Gulden Ulkumen (2015). "The empirical case for distinguishing two dimensions of subjective uncertainty," Unpublished manuscript. University of California, Los Angeles.
- Fuster, Andreas and Paul S. Willen (2013). "Payment size, negative equity, and mortgage default," NBER Working Paper No. 19345.
- Garbarino, Ellen and Mark S. Johnson (1999) "The different roles of satisfaction, trust, and commitment in customer relationships," *Journal of Marketing*, 63(2), 70–87.
- Gneezy, Uri, Stephan Meier, and Pedro Rey-Biel, (2011). "When and Why Incentives (Don't) Work to Modify Behavior," *Journal of Economic Perspectives*, 25(4).
- Hadar, Liat and Sanjay Sood (2014). "When Knowledge Is Demotivating: Subjective Knowledge and Choice Overload," *Psychological Science*, 25 (9), 1739–1747.
- Hadar, Liat, Sanjay Sood, and Craig R. Fox (2013). "Subjective knowledge in consumer financial decisions," *Journal of Marketing Research*, 50 (3), 303–316.
- Hardisty, David J., Kirstin C. Appelt, and Elke U. Weber (2013). "Good or bad, we want it now: Fixed-cost present bias for gains and losses explains magnitude asymmetries in intertemporal choice," *Journal of Behavioral Decision Making*, 26(4), 348–61.
- Harris, Lloyd C and Mark MH Goode (2004). "The four levels of loyalty and the pivotal role of trust: a study of online service dynamics," *Journal of Retailing*, 80(2), 139–158.
- Hayek, F. A. (1945). "The use of knowledge in society," *The American Economic Review*, 35 (4), 519–530.
- Kahneman, Daniel (2011). *Thinking, Fast and Slow*. Macmillan.
- Keys, Benjamin J., Devin G. Pope, and Jaren C. Pope (2014). "Failure to Refinance," Working Paper.
- Laibson, David (1997). "Golden Eggs and Hyperbolic Discounting," *Quarterly Journal of Economics*, 112 (2), 443–477.
- Loewenstein, George and Drazen Prelec (1992), "Anomalies in intertemporal choice: Evidence and an interpretation," *The Quarterly Journal of Economics*, 573–97.
- Lurie, Nicholas H. and Charlotte H. Mason (2007). "Visual Representation: Implications for Decision Making," *Journal of Marketing*, 71 (1), 160–177.
- Markowitz, Harry (1952). "Portfolio selection," *The Journal of Finance*, 7 (1), 77–91.
- McKenzie, Craig R. M. and Michael J. Liersch (2011). "Misunderstanding savings growth: Implications for retirement savings behavior," *Journal of Marketing Research*, 48 (SPL), S1–S13.
- Meissner, Thomas (2015), "Intertemporal consumption and debt aversion: An experimental study," *Experimental Economics*, Forthcoming.
- Prelec, Drazen and George Loewenstein (1998). "The red and the black: Mental accounting of savings and debt," *Marketing Science*, 17 (1), 4–28.
- Reinholtz, Nicholas, Philip M. Fernbach, and Bart de Langhe (2015). "Almost No One Understands the Benefit of Diversification," Working paper, University of Colorado Boulder.
- Scholten, Marc, Daniel J. Walters, Carsten Erner, Daniel Read, and Craig R. Fox (2016), "A diagnosis of tolerance and aversion to debt," Working Paper, Universidade Europeia.
- Sirdeshmukh, Deepak, Jagdip Singh, and Barry Sabol (2002). "Consumer trust, value, and loyalty in relational exchanges," *Journal of Marketing*, 66 (1), 15–37.
- Slovic, Paul (1987). "Perception of risk," *Science*, 236 (4799), 280–285.
- Stanton, Richard (1995) "Rational prepayment and the valuation of mortgage-backed securities," *Review of Financial Studies*, 8 (3), 677–708.

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- Slovic, Paul (1972). *From Shakespeare to Simon: Speculations and some evidence about man's ability to process information*. Oregon Research Institute.
- Sweeney, Linda B. and John D. Sterman (2000). "Bathtub dynamics: Initial results of a systems thinking inventory," *System Dynamics Review*, 16 (4), 249–286.
- Sterman, John D. (2010). "Does formal system dynamics training improve people's understanding of accumulation?" *System Dynamics Review*, 26(4), 316–334.
- Tax, Stephen S., Stephen W. Brown, and Murali Chandrashekar (1998). "Customer evaluations of service complaint experiences: Implications for relationship marketing," *Journal of Marketing*, 62 (2), 60–76.
- Tversky, Amos and Daniel Kahneman (1981). "The framing of decisions and the psychology of choice," *Science*, 211(4481), 453–458.
- Yates, J. Frank and Royce A. Watts (1975), "Preferences for deferred losses," *Organizational Behavior and Human Performance*, 13 (2), 294–306.
- Zinman, Jonathan (2009), "Where is the missing credit card debt? Clues and implications," *Review of Income and Wealth*, 55 (2), 249–65.