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Psychology of Investing

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Summary: In addition to the section's official business, this session features a presenter discussing the psychology of investing. Richard H. Thaler is the Robert P. Gwinn Professor of Economics and Behavioral Science at the University of Chicago's Graduate School of Business where he is also director of their Center for Decision Research. He is also research associate at the National Bureau of Economic Research where he co-directs the behavioral economics project. Professor Thaler's research lies in the gap between psychology and economics. He is considered a pioneer in the field of behavioral finance and has authored numerous articles and books.

Ms. Judy L. Strachan: I'm chair of the Investment Section Council. I'm just going to give a brief summary of the council's activities during the last year. The general business of the council is to sponsor 22 sessions at SOA meetings every year. We also distributed three issues of the newsletter, *Risks and Rewards*. The council sponsored a research project on long-term interest rates, co-sponsored the Value-at-Risk and Modeling conference, the Use of the Derivatives project, and a Currency Risk project. We've recently agreed to sponsor a new project that is called Interest Rate Models in Actuarial Practice, which we hope will be interesting. Other projects the council has agreed to sponsor include Application of Non-parametric Techniques for Forecasting Big Jumps in Interest Rates. We sponsored a monograph on stochastic calculus and stochastic differential equations. Also, the council purchased an extensive list of investment books for the SOA library.

Council plans for next year include sponsoring another 22 sessions at SOA meetings, publishing four issues of *Risks and Rewards, and* awarding a Redington

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Prize. We plan a monograph that provides a retrospective on investment literature that has been published over the last 20 years.

Sections can do many things to support the Investment Section council. The council always needs ideas. We need ideas for meeting sessions, seminars, research projects, and educational materials.

Beyond ideas, the council needs volunteers. Volunteers are needed to help coordinate sessions, to coordinate projects, to write a newsletter articles, to write an article about this session, to edit newsletters, to chair, to participate in the Redington Prize Committee, and to run for the council.

I've been the chair of this Investment Section Council for the past year. I want to briefly introduce the new council members to you. First, I want to introduce the new chair for next year, Joe Tan.

Mr. Joseph H. Tan: Rather than bore everyone with more council activities and the plan for the coming year, I think everyone is more excited to hear what Professor Thaler has for us. Watch out for the recent *Risk and Rewards,* which will discuss plans for next year.

Ms. Strachen: The Section Council members are: Rick Jackson, Frank Sabatini, Christian Marc Patterson, and Peter Tilley. Now I want to introduce Dr. Thaler. He's the Robert P. Gwinn professor of economics and behavioral science at the University of the Chicago. He's also a research associate at the National Bureau of Economic Research. He's a pioneer in the theory of behavioral finance. He's also the author of a number of books, including, *Winner's Curse*, Quasi Rational Economics, and *Advances in Behavioral Finance*.

Dr. Richard H. Thaler: This is a Pythagorean theorem quiz, which is easier than any question on the actuarial exam. What we have here are two one-mile lengths of railroad track that are nailed down at the end point. It gets hot and each length of track expands by one inch, so the track goes up like a drawbridge. To help you I have a scale drawing that I constructed. This is one mile, plus one inch and the question is, "What's the altitude of this right triangle?"

I'm sure you are all capable of solving that with the help of a calculator. The question is, How do you do it in your head? I'd like everybody to determine an answer to this question and then to either write down or think in your head a high and low estimate such that you are 90% confident that the correct answer lies between your two numbers. I think this is an actuarial task, so you should be pretty

good at it. Everybody has to do this before I can proceed, and no calculators are allowed. As long as your correct answer has a 90% chance of lying between your two numbers, I'll be happy.

Let me ask a couple questions. First of all, you had a high number and a low number. How many of you had a high number that was equal or less than three inches, raise your hand? The correct answer to this problem is 26 feet. How many people had the right answer in your 90% confidence? About half a dozen, which is remarkably good. However, there are about 70 of you in here, so if you were perfectly calibrated, then 90% of you would have the right answer within your limits but, instead, something less than10 % had the right answer.

Now, this problem is an example of what we call a cognitive illusion. You're all familiar with visual illusions. You've seen the two arrows that have the same length, and one looks longer than the other and so forth and so on. Those are mental tricks that the mind plays on us where we see something that's different than what's really there. A problem like this fools our intuition, the way those problems fool the visual system. I'm going to try to use some problems like this to introduce you to a field called behavioral finance and show how you this might have some effect on financial markets.

The reason this matters is because those of you who have studied finance in school know that the theory of financial markets and, in fact, economic theory, in general, is based on assumptions about behavior. In particular, the assumptions are that people are rational. They make rational expectations, so their forecasts about the future are unbiased. Essentially, their forecasts are the same as an econometrician would make using a statistical model.

The second assumption is the expected utility maximization. This means that people make decisions according to the axioms set down by Von Neumann and Morgenstern; that is they make them rationally. Over the last 20 years or so, evidence has been mounting that this isn't a very good model of actual behavior. What I'd like to do is start by introducing you to a few examples, like the railroad track problem, of ways in which actual human behavior differs from this model. Then I'll talk about what the implications of that are for understanding the way financial markets work.

To illustrate, let's start with one of the problems in which I asked you to rate yourself in ability to get along with other people compared to the other people in the room. Now, 58 of you filled in that form, and I don't have to explain to a bunch of actuaries that if we split 58 people up into deciles, there are 5.8 in each cell, so

let's see how people filled out this form. Just about the right number of people thought they were in the first decile, but then we have 10 in the second decile, 11 in the third, 12 in the fourth, 13 in the fifth, and then eight. So we have eight below average and 50 above average. When I do this exercise, the most popular category is the second decile, which I attribute to modesty.

I'm not sure exactly what to make of these results. It may be that actuaries are the most modest group that I've ever addressed, although my own theory is that most of the people didn't pay enough attention to the other people attending this session category. But the finding that I find robust is more than half the people think they're above average. That is true of virtually any question one could ask.

I teach a course in decision making at the University of Chicago. On the first day of my class I ask the students to predict, anonymously, where in the grade distribution they will come. Out of 125 students in two sections of this class, not one thought he or she would be below average. We had 125 expecting to be above average, zero expecting to be below average, and, needless to say, 62½ of them were disappointed when the quarter ended. That's an example of overconfidence.

Another illustration of overconfidence is if you ask people to estimate something like the railroad track problem. Suppose I ask you to estimate the population of Topeka, and give a 90% confidence limit for that. Typically, people's confidence limits are too narrow. Instead of being wrong 10% of the time, for things like these trivia questions, people are wrong about 30% of the time. We think we know more than we do, and we think we know with greater precision than we actually do.

Here's a second example. Will someone give me the last three digits of your Social Security number?

From the Floor: Three hundred seventy nine.

Dr. Thaler: Three hundred seventy nine. Let's add 400 to that. Now I'll ask you the following question. The Huns under Attila invaded Europe, penetrating deep into what is now France where they were defeated and forced to return eastward. Did these events occur before or after 779 A.D.? Take a guess? You have a 50/50 chance.

From the Floor: After.

Dr. Thaler: And when do you think that might have happened?

From the Floor: I have no idea.

Dr. Thaler: I recommend to be consistent that you guess a higher number. Let's say 800. This is a task that a colleague and I asked my MBA students to do at Cornell, where I used to teach for many years. Cornell MBA students don't know anything about European history. What they do know is that whenever this happened, it had nothing to do with the last three digits of their social security number. Nevertheless, what I've done here is group the answers people gave by the anchor they wrote down. What you see is a very strong monotonic relationship between the answer they give and the anchor they had. And, in fact, between the low group and the high group, we have a 360-year difference in the guess that people made. So this is an example of what we call anchoring an adjustment. If I ask you to estimate some quantity, and if there's a number lying around, you will use it. That's the basic result. What this shows is you'll use it regardless of how irrelevant that number may be.

Think about an earnings estimate in financial markets. When analysts are making earnings forecasts, there's a lot of numbers lying around, in particular, earnings last quarter and earnings last year. Those serve as natural anchors and it's just human nature to start with that. If I'm an analyst and I'm trying to forecast what IBM is going to earn next year, and I know they've made $2.00 last year, I'm going to start with $2.00. I will say it will be higher or lower, and I'll predict how much higher or lower it will be. That's just a natural way of doing it. And what that says is that they'll be biased in certain circumstances.

Here's another example of anchoring an adjustment, which is my personal favorite. A bunch of undergraduates were asked these two questions. How happy are you and how often are you dating? The first group of students was asked these two questions in that order. The correlation between their answers was barely positive: 0.12. Another group of undergraduates was asked the same pair of questions in the opposite order; namely, how often are you dating and how happy are you? The correlation jumped to 0.66.

We call this the dating heuristic. The idea is if you ask somebody a question like how happy are you?, and if the person is an undergraduate, that's a complicated thing. It depends on many of factors: how you're doing in school, how you're getting along with your roommate, how you're getting along with your parents, and how often are you dating. All of these factors will come into play. If you start with how often are you dating, they anchor on that and that will carry too much weight in the answers that they end up giving. All of these anchoring effects should give you pause the next time you look at survey results.

There's a business that I offer, the sort of write-your-own-results survey business. We'll get whatever results you want, by simply rewriting the questions and the scales that people use in filling them out. By properly selecting the scales, you can pretty much get everybody in the room to say they're 80 or 12, depending on which one you want. Obviously, this is not what we're interested in getting most of the time. You want to pay a lot of attention to what the survey instruments look like.

One of the domains in which I've done a lot of research is what I call mental accounting. Let me illustrate mental accounting. If you've ever been to a casino, you've probably observed somebody who wins some money early in the evening. Let's suppose someone went into the casino with $200 to gamble and won $300 in the first hour. You'll observe this person who takes the $200 he brought with him and put it in one pocket and the $300 that he won and put it a different pocket. The winnings are referred to as the house money in gambling parlance. The casino is the house. The gamblers refer to the money they won from the house as the house money; whereas, the money gamblers bring with them is their money. Gamblers act as if they are different kinds of money, so losing some of the house money is no big thing. Easy come, easy go. Whereas, losing their own money is worse; that's real money.

This is something I first noticed when playing poker with my economist colleagues. This is a very low stakes poker game, and I'm playing with somebody who probably has a net worth of a $2 million. When they are down $50 in a poker game, they are different people the next night when they're up $50 in the poker game. That's because the way they gamble doesn't depend on their wealth; it depends on the stake in that mental account, or in the particular game they are playing. Having taken as much money as I could from my colleagues, I turned to doing research on this topic. I'll discuss an example of how we do research in this area.

We brought some students into the lab and we told them, truthfully, that they just won $30. Now, choose between the following: a) a coin flip for nine dollars, and b) no further action. Seventy percent will say they will gamble.

Another group of students was brought into the lab and they're told their choices are: a) 50% chance to win $39, b) 50% chance to win $21 and c) a sure $30. In this instance, 43% chose to gamble. If you do the arithmetic, you will see these problems are identical.

This problem illustrates two things. First, it illustrates what we call the house-money effect. This version produces this feeling of winning the house money, so they think of that $30 as money they just won from the experimenter. They don't mind

gambling with that money. The second situation doesn't produce that thinking. We get almost a 30% shift in behavior depending on which set of words we use to describe the problem. Now, that's an illustration of what my psychologist friends, Amos Tversky and Danny Kahneman call framing. The way you write down the problem has a strong influence on the choice people make.

This presents a big problem for any mathematical theory of decision making under uncertainty. Any theory you would normally develop will represent these problems the same way. If you represent the outcomes in terms of payoff and probability, you're going to write these two down the same. So you will predict the same behavior. There is a formal way of representing these situations in which they will be different. It depends on when people make choices. They evaluate the choices as changes relative to some reference point. What we're doing is manipulating what people think of as the reference point.

Let me give you another example of framing. Kahneman and I did a big telephone survey about ten years ago. We were interested in what people think of as fair action by firms. We asked hundreds of questions. Respondents, typically, answered about five of these. A shortage has developed for a popular model of an automobile. Customers must now wait two months for delivery. A dealer has been selling these cars at list. Now, the dealer sells this model at $200 above list. Is that action fair? They rated this on a four-point scale. It just collapsed into fair and unfair, justifiable and unjustifiable. Only 29% of the people thought that raising the price above list in the face of a shortage was a fair thing to do.

Then we asked another group about, essentially, the same scenario, but we said a dealer has been selling these cars at a discount of $200 below list. Now the dealer sells this model at list price. Fifty-eight percent think that's fair. There was almost a 30% shift in behavior or in judgement simply by changing the words. The dealer did exactly the same thing, which is raise the price $200 in the face of the shortage, but 30% more of the customers are unhappy with that action if the dealer is imposing a surcharge rather than eliminating a discount.

I used to teach a course on pricing and my first rule of pricing was you never have a surcharge. Whatever the highest price is that you're going to charge, that should be your price. And then there are smaller discounts and bigger discounts, but they're only discounts. If you look on the back of the door of your hotel room, you'll see that in play. In many states, they have to post a price somewhere, and they'll always post the highest price they ever charge. Everybody thinks they're getting a good deal.

This problem illustrates another very important phenomena that we've discovered in the psychology of decision making which is called loss aversion. Roughly speaking, losing money hurts about twice as much as winning money makes you feel good. Here's one way to think about that. Let's say I offer you a gamble. Let's say it's a coin flip: heads you win $1,000, tails you lose X. How big can X be for you to take that gamble? We know if you're risk neutral, that's $1,000. If you ask people that question, typically, you'll get an answer that the loss has to be half the gain before they're willing to take it. In order to get people to take that coin flip to win 1,000, they wouldn't be willing to lose more than $500. What that suggests is that they're multiplying losses roughly by a factor like two.

Similarly, we ran an experiment at Cornell where we went into a classroom, and we gave half the students some Cornell coffee mugs of the sort you can buy for $6 in a college bookstore. This particular porcelain mug depicted a seal that says "Go Big Red" on the mug. Then we had a mug market. All the people with mugs could sell; all the people who didn't have a mug could buy. We wanted to see what would happen. What happens is people are loss averse in mugs. The ones who had a mug didn't want to give it. But those who didn't have a mug didn't really care about buying them. What we found was the asking price of the seller was $4.75. Of the students who didn't have mugs, the average bid price was about $2.25. Notice, again, you're getting a bid price at a ratio of about two to one. The amount somebody is willing to pay to get something in this situation is about half of the amount that they would demand for giving up that very same thing, if they happen to have it.

You would see the same thing if anybody was lucky enough to have World Series tickets. You'll see lots of people with a ticket going into the game. Prices for tickets outside the stadium will be going for hundreds of dollars. People with tickets won't sell, even though they would never dream of paying that amount of money to get a ticket. That's the same phenomenon. It illustrates people under weight opportunity costs relative to out-of-pocket costs. So if I go to the game and don't sell the tickets, that's just an opportunity cost. That doesn't hurt as much as actually shelling out $500 for a lousy seat.

That was a very brief introduction to what is a very long list of ways in which people's behavior differs from the standard rational economic model. What difference does this make? At the University of Chicago, where I'm now employed, it's still the case that in all the finance courses, except the one I teach, these two assumptions about rational behavior are still there.

Why are economists and, in particular, financial economists clinging to these assumptions about behavior? At the University of Chicago, two excuses are commonly offered, both of which are really due to Milton Friedman, the great Chicago economist, and one of the great economists of the century. The first argument Friedman made was that people may appear irrational in some settings, but in markets they will be driven to being rational. Typically, when that is said, there's some hand-waving going on, because it's never quite clear exactly how that works, it is something I'll come back to in a second. The second argument is called the "as if" defense, which is people behave as if they were rational.

Let me come back to the first argument and start with the question about markets. The first point that I want to make is that irrationality is rarely fatal. An example would be people who engage in mental accounting or putting money into two different pockets. This doesn't cost the individual anything, and there's no particular reason to think that it will cost you something. Even when it does cost you something, for example, people fail to ignore some costs the way economists say they should, and so they cling to their losing investments. They don't sell their losing investments or sell their winners. This is the behavior we have observed. This raises their tax bill. If they sold their losers, the government would share their losses with them. If they sell their winners, the government shares their gains with them. It is better to share your losses with the government than it is to share your gains. These people end up with higher tax bills than rational folks. But, as far as I know, these people don't disappear from the world. Markets, unlike some vague evolutionary stories, don't force irrational people off the face of the earth.

Another point is that stupidity does not always create arbitrage. Let me offer as an example closed-end mutual funds. I don't know whether you're all familiar with closed-end funds, but a closed-end mutual fund is a fund that raises a certain amount of money, and then sells shares. The shares are then traded on the exchanges. This is unlike an open-ended fund, where the fund stands ready to buy and sell at asset values. These shares trade at market prices. Now, what we observe is that closed end funds don't sell at net asset value. Typically, they sell at discounts, though they have, on occasion, sold as premia.

There was a weird period in 1989 where the Spain Fund was selling at over a 200% premium. So you could buy $100 worth of Spanish stock for $250 by buying a Spain Fund, or you could go to Spain and buy it for a $100. Nobody I know has a sensible explanation for why that was happening, but there was no arbitrage opportunity. The reason for that gets to be a little technical, but the reason why it's not an arbitrage opportunity boils down to why the strategies being used by Long-Term Capital Management (LTCM) were not arbitraged.

Think of the bet you might want to make on a closed end that's selling at a discount. Suppose the fund is selling at a 20% discount. What would you want to do? You'd want to buy the funds and short what they own. That's the trade you would put on. That's exactly the kind of trade that LTCM was putting on (not in closed-end funds, but in other markets). What you're hoping is that the spread will narrow. Of course, what happened to them is the spread widened. When the Spain Fund went to a 20% premium, you could have put on a trade and then watched it go to a 250% premium. You would have been getting a lot of calls from your bankers as some of my friends are.

It's also not the case that the irrational traders necessarily lose money. There's a lot of theory that has been worked out over the last ten years or so. Unlike the vague hand-waving arguments that Friedman used to make, irrationality doesn't necessarily lead you to lose money. In fact, there are some situations in which the irrational traders make more money, and they do so by inadvertently bearing risk. Since high-risk stuff pays typically higher returns, they end up richer, not poorer. In the economics literature the irrational people are now called noise traders.

The "as if" argument is the following. Let's suppose that you gave Mark McGuire or Sammy Sosa some quiz on physics and trigonometry. They would undoubtedly fail it. But when they see a ball thrown at them at a 100 miles an hour, they can still hit it out of the ballpark. The argument would be that they act as if they could solve those complex equations even though they can't. That's a pretty clever argument. As Friedman says, "You shouldn't judge a theory based on the validity of the assumptions; you should judge it based on the validity of the predictions that it makes." I agree with that. Let's judge the economic theory of financial markets based on whether it gives us a good description of the world.

I have implications of the rational efficient market framework on the left-hand side and embarrassing facts on the right-hand side. What this should say is, changes in prices reflect news. In a rational world, prices are always equal intrinsic value, so every asset is priced at the rational price. What that means is that prices only change when the intrinsic value changes. Let's define that as news. So if we observe that the price of GM goes up by 5%, it should be because the intrinsic value of GM went up by 5%.

Perhaps the most dramatic counter example is what happened in 1987. We're having slightly less dramatic versions virtually everyday now; the versions are very large price movements in the absence of news. On October 19, 1987, prices in the U.S. fell by more than 20% on a day with virtually no news. In fact, the only news that day really was that prices were falling worldwide. The German Bundesbank

changed its discount rate or something like that. Needless to say, no discount rate change by the Bundesbank has ever affected world prices like that before or since, and we've read similar examples of this over the last year or so.

About a year ago, there was a big drop in stock prices, about 500 points, on a Monday. This came to be known as Gray Monday. This happened at the beginning of the Asian problems. On the next day, the market opened down another 200 and then closed up 300, so we had a 500-point rise between 10:00 and 3:00 New York time. Needless to say, nothing in Asia was happening between 10:00 and 3:00 New York time. Nobody knows what caused the 6–7% increase in the value of the U.S. economy between 10:00 and 3:00. Again, that day the only news was IBM announced some share repurchases which normally doesn't raise the value of the U.S. economy by 6% or 7%.

A second implication of the rational model is that everybody buys the market portfolio. The only rational thing to do in an efficient market is to be diversified, so, of course, we assume that's what people do. What this means is everyone in the world would own the world index portfolio and, of course, we observe virtually no one owning that portfolio. Individual investors are very poorly diversified as I'll show you a bit later. In their 401(k) plans, they own lots of stock in their own company.

In a rational model there isn't any trading. Economists sometimes refer to this as the Groucho Marx theorem. You remember Groucho had a joke that said he would never want to belong to any club that would have him as a member. The economists' version of this joke is that in a rational world no trading will occur. Let's suppose Charles is rational and I'm rational, and I know Charles is rational and he knows I'm rational, and I know he knows I know and all of that. Charles calls me up and says he has a $100 share of Microsoft he wants to sell me. I figure he must know something. So in a rational economic model I will never want a trade where somebody's willing to take the other side of it.

There's essentially no trading in this rational world. There's a little rebalancing and a little liquidity trading. But we don't get 700 million shares traded on a boring Thursday on the New York Stock Exchange. We certainly don't get all the foreign exchange trading that we observe. We also don't get active portfolio management. Although the index investing is growing, it's still a very small percentage of the total funds under management. The rational economic model predicts that the active fund management business doesn't exist because no one would give them any money.

Another principle of the efficient market hypothesis is that stock prices are unpredictable. Twenty-five years ago we knew this was true. Now we know this is false. It's hard to pick up an issue of the *Journal of Finance* or any of the top financial economics journals without reading papers that describe exceptions to this principle. So I listed some exceptions here. They fall into two categories. There's a bunch of classes of firms, small firms, prior losing firms, and value firms measured in lots of different ways like low price/earnings (P/E) ratio or price-to- book ratio. All of these firms appear to have high returns; of course they are not small firms in the last five years and, particularly, not in 1998.

Actually, what's happening to small firms in 1998 is one of the more interesting phenomena in recent years. The Russell 2000 is trailing the S&P 500 by about 28% this year. They roughly divide stocks into the top 3,000. The top 1,000 is the biggest and the Russell 2000 is the next 2,000 stocks. It's an index of smaller firms. As we know, over a long period, small firms have outperformed big ones. For them to trail the big firms by 28% in 10 months is quite remarkable. It's going to make evaluating portfolio managers very difficult.

Anyway, all of these in some ways can be thought of as overreaction. There's another class of studies that finds what could be thought of as underreaction. In particular, the market doesn't seem to give enough credence to corporate announcements of virtually any type. These may be examples of anchoring. For example, if a firm announces that they're going to increase the dividends, or that earnings have been particularly high, or that they're repurchasing shares, all of those things are good news. The market reacts immediately and then drifts in the same direction for a long period of time, like months. It's like the market is underreacting to the news because you get a jump and then a drift in the same direction. Twenty-five years ago we knew none of this could happen and my colleague, Gene Farmer, wrote a survey of efficient markets in 1971, arguing that this couldn't happen. Now he's one of the people who has written the study that shows that lots of things seems to be predictable. We don't quite know why yet.

Another principle of rational efficient markets is that only the nondiversifiable risk is priced. That means in the capital asset-pricing model, beta, the covariance of the returns of the security with returns on the market is what you get paid for owning. You don't get paid for owning diversifiable risk like standard deviation. You don't get paid for variance; you get paid for covariance. That's what I learned when I studied finance. That turns out to be false. Beta doesn't matter. In fact, if you control for size, beta works the wrong way, that is in any group of firms organized by size, for example, within the smallest decile of stocks, the high beta stocks actually earn lower returns than the low beta stocks.

Another of my Chicago colleagues, Merton Miller, wrote a famous paper with Modigliani. This paper shows that in a world with no taxes, it doesn't matter whether a firm pays dividends or not. It's called the "Modigliani Miller Theorem." We know that in a world with taxes, firms should never pay dividends. The reason for that is they can make their taxpaying shareholders better off by repurchasing shares and make no one worse off. So in a rational world with taxes, firms don't pay dividends. Nevertheless, what do we observe is most big firms do pay dividends. More surprisingly, when they increase, the dividend share prices go up. The firms make the shareholders worse off by raising the shareholder's tax bill, and the shareholders reward the firms by increasing the price of the stock. We have no satisfactory explanation for that behavior.

What I do I conclude? I conclude the assumptions are unrealistic and the predictions are poor. If so, maybe it's time for a new theory. But we don't have a fully developed behavioral equivalent to the Capital Asset Pricing Model (CAPM), although I will say there's movement on this front. There are papers coming out this year. One will appear in the December 1998, (Volume 53, Number 6), issue of *Journal of Finance* called "Investor Psychology and Security Market Under-and Overreactions" and another one will be in the September 1998, (Volume 49, Number 3), issue of *Journal of Financial Economics (JFE)* called "A Model of Investor Sentiment." Both of these are behavioral theories of asset prices. Let me say they're not right. They may be less wrong than the CAPMs. They're not the final answer, but they're a start. So if you're interested in these, the one in the *JFE* is by N. Barberis, A. Shleifer, and R. Vishny, and the other is by Kent Daniel, David Hirschleifer, and Avanidhar Subrahmanyam, and that's in the *Journal of Finance*. These are both forthcoming, and you can actually download them from the web pages of these journals.

Let me read you a quote from a Chicago economist writing in the *House Journal* in 1918. He says, "The economist may attempt to ignore psychology, but it's sheer impossibility for him to ignore human nature. If the economist borrows this conception of man from the psychologist, his constructive work may have some chance of remaining purely economic in character. But if he does not, it will not, thereby, avoid psychology. Rather, he will force himself to make his own, and it will be bad psychology." Behavioral finance, in my definition, is to borrow good psychology rather than invent bad psychology. That's what we're trying to do. That brings me to the number game.

From the Floor: I have one observation. Those of you who know Luke Girard will appreciate this. He never follows directions and refuses to be pinned down to one number. So his answer was 70 to 79 on the first one.

Dr. Thaler: This is the second little game we played. Guess a number from zero to a 100. The object is to guess the number that's equal to two-thirds of the average as close as possible. How might people play this game? Here's what I call the level-zero analysis. I don't know how to play this game. It's random. Pick a number at random. Fifty.

From the Floor: There were no guesses of 50.

Dr. Thaler: That's good. Then we have what I call level one. Most of these other players still seem asleep. They'll guess 50, so I'll guess 33. Then we have level two. Most of these players think they're pretty smart, but they think everybody else is asleep, so they'll get 33, so I could get 22. Then we get to level three. Most of these other players will figure out how this game works. They will think that most people will take 33, they'll get 22, so I should get 15. Now, you can see there's no particularly convenient place to get off this line of thinking. This train is converging toward zero. We have at least one card-carrying economist in the room—my friend, Hank, who will be happy to explain to you that the only equilibrium in this game is for everybody to get zero. That's the only number that, if everyone guesses it, no one would want to change their guess. The economist's analysis of this game is that everybody guesses zero. I can tell you that's a lousy guess. That's a really bad guess as you'll see in a minute.

Why do I have you play this game? I'd like to tell you about a passage from a book that's on the forbidden reading list at the University of Chicago, namely, John Maynard Keynes's *The General Theory of Employment, Interest, and Money* (Harcourt Brace, 1965). Keynes wrote a very famous passage. It's a famous passage that I think a lot of economists have never read, but they've all heard about it. Let me give you the background. Apparently, the general theory was written in the 1930s. Keynes was British. I gather in London, it was common to have contests in the subway, where they would have a poster with pictures of 100 attractive young ladies. All participants were asked to guess which six young ladies would get the most votes.

Here's what Keynes says, "The stock market or professional investment, in particular, may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from 100 photographs. The prize being awarded will go to the competitor whose choices most nearly correspond to the average preferences of the competitors as a whole. So each competitor has to pick not those faces which he, himself, finds prettiest, but those which he thinks are likely to catch the fancy of other competitors, all of whom are looking at the problem from the same point of view. It's not a case of choosing those that in one's

judgement are really the prettiest, or even those that average opinion genuinely thinks is the prettiest. We reach the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be, and there are some, I believe, who practice the fourth, fifth, and higher degrees." Now, this is what Keynes thought was a good metaphor for investing in the stock market, and I think that metaphor still holds. In fact, I now force my graduate students to go back and read Keynes's Chapter 12. If you've never read this, I recommend it. Get it out of the library and read Chapter 12.

How would you people play this game? Before I talk about your results, let me tell you, I had the opportunity to play this game for high stakes. The Society of Actuaries wasn't prepared for these stakes. The *Financial Times (FT)* asked me to write an article about behavioral finance a little over a year ago, and I said why don't we have a little contest. Somehow they got British Airways to put up two business class tickets from London to the U.S. to the winner of the Guess the Number Game. So we had nearly 1,500 entries. The average guess was close to 19, meaning the winner was 13.

I have a histogram. The scale is a little off here, but there were a lot of people who guessed zero or one. Another group guessed 22. This is 33 and another group is at 33. Here's the winner. Then you might wonder what these guys are. These are a bunch of students at Oxford trying to move the market.

This thing almost didn't happen because the *FT* lawyer called me up a week before this thing and said, "We can't do this because it's a game of luck and these types if games are forbidden." I said, "No, no, this isn't luck, this is skill. You have to guess what other people are going to guess" You know, it's just like Keynes. And she said, "No, no, no, no, that's luck." And we went around and around on this. Finally, she said she would allow the game only if we allowed integer guesses. She ruled that it was skill up to rounding error and then luck, so we needed it. I was unhappy with this at the time, but this turned out to be a lucky break because we needed a tie breaker. We had people write a little 25-word essay justifying their answer. I have a few of those with me.

The British are a very clever group. Here's a man's answer with a name of a famous economist who guessed zero, "So behaviorists observe a bod and *FT* reader, ergo, a clever sod. He knows the competition and will fight him, so he reduces the number ad infinitum." The other guy guessed one and said, "The answer should be zero, but labor one." He wanted to allow for a trace of irrationality. A lot of the people who guessed one did that. Then there was some student that guessed seven. He said, "My dad knows an average amount about numbers and markets, and he bottomed

out at 10." So he used his father as a proxy and, like most, he underestimated his father. I'll give you one more. There was a guy who guessed 10, another poet, "Over 67 only interest fools, so over 45 implies enumeracy rules. One to 45 random averages to any three, so logic indicates 15, leaving 10 to me." He would have won if 10 had won.

So in our group here the average guess was 27. We had four people who guessed over 67; they, obviously can't win. Then we have a big group at the first level, another group at the second level, a very big group, and around 15, which is where you want to be in this game. There is another group that's thinking a little bit too hard and, then, five economists, who never win. So there were two winners. I actually brought a copy of my book, *The Winner's Curse*, to give to one of them and they can fight it out. Actually, if one gives me a card, I'll send the other one a book. We could have a tie breaker, right?

Let me talk about a couple of research projects that I've been involved in recently. There's a well-known puzzle in economics called an equity premium puzzle. Data goes back to 1926. There's a nice book by Jeremy Siegel called *Stocks for the Long Run* that takes the data back to the 1800s. What we observe is very large differences in returns between stocks and bonds.

If you go back to 1926, which is the earliest day that most of us are used to looking at, and you have one dollar invested in the S&P 500, it gets to be worth about $2,000. One dollar invested in bonds is worth about $35, T-bills are about $15, and inflation is $8. So one question is, why does anybody hold any bonds? In particular, why do long-term investors, which would include people saving for retirement, and I might add insurance companies, hold any bonds, not to mention mostly bonds? Why would anybody choose $35 over $2,000? Here's an answer to that question that uses two concepts, which I introduced to you earlier: mental accounting and loss aversion.

I'd like to introduce you to an advanced topic which is dynamic mental accounting. The idea of dynamic mental accounting is the frequency with which people evaluate their portfolio. To illustrate that concept, I need to tell you a story about a famous bet that Paul Samuelson, another great economist over this century, offered to colleagues.

The story is Samuelson is having lunch at the MIT Faculty Club, and he's baiting one of his colleagues, telling him he's a coward. He said that he read somewhere that the definition of a coward is somebody who won't take either side of a bet at two-to-one odds. So he won't bet on either the Yankees or the Padres at two-to-one

odds. Samuelson offers his colleague a bet to prove his point and flips a coin saying, heads you win $200, tails you lose $100, so you call it. The colleague, as Samuelson expected, said he won't take that bet. But he also said something that Samuelson found surprising, which was, "I'll take 100 of those bets. I won't take one, but I'll take 100." Samuelson quotes his colleague's justification for turning down one bet as follows, "I won't bet because I would feel the loss more than the gain." I'd feel a $100 loss more than the $200 gain. What is he saying? He's saying, "I'm loss averse." That's a precise statement of loss averse. Now, this was written in 1963, well before anybody had coined that phrase or even noticed that principle, but that doesn't mean people weren't exhibiting it, including Samuelson's colleague.

Why does he want 100 bets? Samuelson went home that night and proved a theorem. The theorem essentially says the following: for any wealth level that could occur over the range of that bet, in this case, the wealth of Samuelson's colleague, plus $20,000 to minus $10,000, the range of outcomes that could occur if you won 100 in a row or lost 100 in a row, if over that range you'll always turn down one play of the bet, then you should never play more than one. That's the theorem.

To give you a sense of what the proof is, you can think of a simple induction: suppose he has played 99 bets, and you ask, "Do you want to play the last one?" Your assumption might be no because he won't play one. Then you ask, "What happens if we stop after 98? Will you play number 99?" Well, he should say no, because he realizes number 99 is the last one, since by assumption he won't play number 100.

From the Floor: But it's house money.

Dr. Thaler: Well, that's psychology. The house money, not the theorem, has a lot to do with why he's willing to take it. By assumption, he'll turn down any bet over the wealth level that could occur, and house money isn't included. But you're absolutely right. House money explains part of why he'll do this.

Let me give you a little theory of why he'll do it. Let's suppose Samuelson's preferences have a utility function that's piecewise linear. So if he gets one dollar, he gets one util. If he loses one dollar, he loses 2½ utils. How does he like one bet? The answer is, he doesn't, because he multiplies losses by 2½, and the odds of the bet are only two to one.

What about two bets? How does he like two bets? The answer to that is it depends if he has to watch. Suppose Samuelson says, "All right, we're going to give you two bets; we're going to go over here in the corner and play it." Sheldon here is going to monitor and report back how you do. He has a portfolio, and he can compute the expected utility of the portfolio, which if you do the arithmetic, you'll see he has a positive expectation. So what's the implication of this little story? For loss aversion investors, risk aversion is diminished by aggregation. So although a rational person has no business taking 100 bets if he won't play one, a loss-averse mental-accounting person will if he doesn't have to watch.

What does that have to do with the equity premium puzzle? You probably have forgotten that that's what I'm supposed to be talking about. The idea is to think about somebody who's investing in the stock market. Every day the first thing he does is log onto the Web and check his portfolio on Yahoo finance. There are so many people in that category and not only every day, but every 15 minutes. Now how is somebody doing that going to like investing in stocks? Suppose he's loss averse like Samuelson's colleague? He's not going to like stocks, because on a daily basis stocks go down almost as often as they go up. And if you're multiplying losses by 2½, then you're not going to be too happy about investing in the stock market.

Suppose, instead, that we have Samuelson's colleague doing a version of "Rip Van Winkle." He knows he's about to go sleep for 20 years. The last thing he does before dozing off is to tell his broker to buy stock. How is he going to sleep? Like a baby, because over a 20-year period the chance of stocks going down is very small and the chance of stocks underperforming bonds is very small. So what a colleague of mine and I did was to take this insight and ask how often would people have to be evaluating their portfolios to make them indifferent between stocks and bonds. My colleague's research shows that the frequency would need to be approximately once a year for investors to find stocks and bonds equally attractive. I would argue that that's a fairly plausible outcome. We do our tax returns once a year. We get big statements from mutual funds and 401(k) plans. Pension-fund managers have to make a big presentation to their boards once a year. Many things are done on a calendar-year basis. It's not that people aren't paying attention to both shorter and longer term. But the most salient evaluation is once a year. That would explain why the equity premium has to be so big to get people to invest in stock.

One ask might ask what has been going on in the last five or 10 years and how does that get so high? Part of the answer, is that there was a big segment of the population that didn't know about losses. So the 401(k) investors, who are new to this game, haven't seen a down market. Even 1987 was an up year. In 1987 the market ended up at 5%. The last real bear market was 1973–74 and that's a long

time ago. We have a lot of people who are playing this game who think a bad year is when the market goes up 5% or 10%. In both 1987 and 1998, interestingly enough, we've had a big correction after a big run up. For 1998, if we end the year where we are, large capped stocks are still in positive territory. People are not going to see big red ink. They saw big red ink on their quarter reports, but I don't think that's going to teach people any big lesson. This research is simply a mathematic simulation. We plugged in a more sophisticated model than this little P slide linear thing I wrote up. The model simulated the result if people had those preferences, and they were drawing from historical distributions, and were asked how often would they have to be counting their money to make stocks and bonds equally attractive. The computer answered within 13 months.

The last topic which I've already started to talk about is, what are people doing in their 401(k) plan? Before I get to that, let me give you one psychology experiment. A professor at Stanford, Itamar Simonson**,** went into his class and told one section of the class that on each of the next three weeks he would bring in some snacks and give each student one snack. In one version the students were told to choose what they wanted to have on each of the next three weeks. There were three candy bars and three bags of salty things, like pretzels, potato chips, and peanuts. In the other version the students were told they would get to pick their snack each week. What do you think happened?

In the simultaneous choice condition people diversified. So almost two-thirds of the people choose three different snacks when they choose at all. But when choosing one at a time, almost nobody did that. We call this the diversification heuristic. Like most of heuristic, this a sensible thing. People use the rules of thumb when they're sensible. And diversification, as we all know, is a sensible thing to do, but sometimes people do it when it isn't sensible. Most of us, when we get the munchies in the middle of the afternoon and wander down to the vending machine probably pull the same lever every time. What this says is that if we had to pick in advance, we would pick a bunch of different things—things we would end up, actually, not really wanting. Again, my colleague at UCLA and I wondered whether we'd observe the same behavior of people choosing 401(k) plans.

Here's the way we implemented that. Think of an extreme version of the example, which we'll call the heuristic. Suppose those are "n" funds in the plan. The simple strategy is to divide your money equally across the "n" funds. There is some circumstantial evidence that people might be doing something like that. For example, for many years, in the Teachers Insurance Annuity Association (TIAA), more or less a bond fund, and the College Retirement Equities Fund (CREF), more or less a stock fund, the most popular asset allocation was exactly 50/50. More than

half of the participants divided their contributions 50/50. Now, of course, their assets in CREF got to be worth a lot more than their assets in TIAA, but that's the way they were dividing their money.

In the TWA pilots' plan, they have five-stock funds and one fixed-income fund, and the pilots put 75% of their money in stock. In the University of California plan, there's one stock fund and four fixed-income funds, and the participants there put 34% of their money in stocks.

Notice that where people are invested isn't necessarily stupid. But what it means is that people are going to pick an asset allocation that just reflects the mix of funds in their plan. This mix may have nothing to do with their risk attitudes, their age, and their financial means.

So Barnarski and I set about to study this a little bit more systematically using two methods. The first is we ran experiments at the University of California using employees there. We asked participants to suppose that they had only two choices in their pension plan: fund A and fund B. Then we asked the participants how would they invest their money. In the first version, the funds were a stock fund and a bond fund. Then, in the next version, it was a stock fund and a balanced fund. Now, in the first version, the modal choice was 50/50. Suppose that's the participants' risk attitude. What should they do here? They should put all their money in the balanced fund. What do you think happened? 50/50. We presented the versions in several different ways, using both verbal descriptions of the fund and graphical displays of returns. In both cases, the results turned out pretty much the same.

There was one other interesting aspect of this experiment. In these 401(k) plans, you typically have a set of funds and participants allocate money among the fund. There's another way you can do this, which is the way they do it in the Chilean privatized social security system. People have to put all their money with one provider and the providers all have essentially balanced funds. An analogous situation in this country would be if you could pick Fidelity or Vanguard. Both of them have some array of funds that they chose, so you're just picking the provider.

That gave us the ideas to wonder whether it would matter which regime people were in, so we ran the following experiment. In what we'll call the U.S. version, we told people there were two funds, stocks and bonds, and asked them to allocate their money. In what we'll call the Chilean version, we said there are five funds and explained that the funds are various blends of stocks and bonds in 25% increments.

The options went from 0% stocks up to 100% stocks. We provided graphical displays of returns, showing what would happen with each of these five funds.

Again, in this particular experiment, they put 57% into stocks. The participants could get that in this version by taking the middle fund, but that's not what they did. They put 75% in stock and half of the participants went to a 100% stock. Again, this is almost like a framing result, because we're really giving people the same set of choices. If they're choosing one blend, they make a very different choice than if they're making the blends themselves.

The second part of the study was not an experiment. We looked at a data set of 170 actual 401(k) plans. This included 1.5 million participants and $50 billion in assets. The idea was to analyze each plan to the extent to which the percent invested in equity depended on the percent of the funds that invest in equity. The idea is to regress the percent in equities on the percent of the funds that invest in equities. Let me give you two facts. First, 62.2% of the funds are equity funds. Second, 61.8% of the money is invested in equity. With those starting points, it won't surprise you that the regression showed a strong relationship between the number of equity funds in a plan and the amount of money people put in equity.

The last thing I'll mention is what happens to company stock. We divided our sample into plans that have company stock as an option and those that don't. In the plans that don't have company stock as an option, we get virtually 50/50 asset allocation. In the plans that do have company stock as an option, company stock gets 42% of the money. It's a little difficult for us to determine how much of this is voluntary. Some of this is forced and some of it is matching. That's not really the point of this exercise.

The point of the exercise is, for whatever reason, the participants have picked this amount of company stock. What do they do with the rest of their money? If this is their proper asset allocation, then they should put 7% in equities and 51% in fixed income. What do you think? Yes, it's 50/50. So let me end on the following note. These are the investors of the future. The 401(k) world is growing very rapidly, much faster than the old defined-benefit world. It's the most rapidly growing segment of the investment world. These surveys reveal most individuals don't know the difference between a stock and a bond, and most think that a money market account is riskier than a Treasury bill. That's the beauty contest that we're playing now. If we continue to think about investments with models in which everybody's as smart as Paul Samuelson and everybody's guessing zero in the number game, then we're going to miss the boat. Let me now take your questions.

From the Floor: You brought up a couple of interesting points. One of them is the issue of psychology on the part of investors. Another is that sometimes behavior seems rational to the people who are behaving because they have utility functions that may not be correct in a purely technical sense. There have been some behavioral psychology studies out. In particular, I remember one from one or two years ago in *The Wall Street Journal* on this phenomenon. It stated that if you have people working in a corporation, or a sales job, or whatever, there tended to be a strong positive correlation between an individual's tendency to overestimate how much they had accomplished in their work and how much their portion of a team's achievement was really due to their own efforts, and the fact that they were objectively measured as performing the best within their organization. I'm curious about what your reaction is to the possibility that behavior that sometimes appears as irrational, because it can be measured and demonstrated to be inaccurate. In fact, it has the effect of being a trait that seems to provide a better payoff in the market. In fact, sometimes the market doesn't only not punish irrational behavior. It may inadvertently be rewarding it. I'm just curious what your thoughts are.

Dr. Thaler: We have a big discussion in my class every year about whether overconfidence is rational. Some student will always take the position that you get rewarded in your organization by being overconfident. I'm sure there are many organizations in which that's true. I don't believe that the stock market rewards overconfidence. I have two studies to support that contention. One is a study of professional investors and one is a study of individual investors. One evidence of overconfidence is a lot trading**.** We observed that for both professional portfolio managers and for individual portfolio managers: the stocks they sell do better than the stocks they buy and, the ones who trade the most do the worst.

If you agree that the reason why they trade so much is that they're overconfident, then that would suggest that overconfidence in the investment domain isn't good for you. Overconfidence may be good for you in getting rewarded within an organization. If so, there's something wrong with the organization. That's another story for next year.

From the Floor: One of the popular products in our industry for the last couple of years has been equity-indexed annuities where people take a principal guarantee and a lower participation in a S&P 500 index fund. Do you think the trade-off on that participation rate is between just going into an indexed fund or going into an equity-indexed annuity? We've seen the participation rates drop for a number of economic factors over the last few months.

Dr. Thaler: I don't know a lot about this area. I think, in principle, some product with a floor should have a lot of appeal. Portfolio insurance, which, as we know, wasn't insurance has some attraction to loss-averse investors. On the other hand, people are very suspicious about things they don't understand and, as we know, derivatives are a dirty word right now. I'd be surprised if 10 or 15 years from now, there aren't very popular products that are offering people a share of the upside and not all of the downside. It's going to take a long time for people to get comfortable with those and to get some experience with a big bear market in which they work. The other thing I'll say is nobody wants to give up the upside when they're getting 30% a year.

From the Floor: You talked about how today's investor hasn't really had a down market. They've been buying into an ever-increasing market. I have a three-part question. One, have you studied some of the transfer dynamics that are exhibited in either the 401(k) plans, or mutual plans, or things of that sort? Two, is there some threshold where people decide that they have to bailout? You read the news reports and over the past couple of months there has been talk about inflows and outflows into mutual funds. All of a sudden we see the big move. You see one report on the Internet that says nobody's moving, and then you see another report that says this is the largest outflow that they've ever had in the last 12 months. Third, is any theory that there's a naive or a savvy investor?

Dr. Thaler: I had to write this down to get this. Regarding transfer dynamics, I can say that we don't have a lot of data on it, but, by far, the vast majority of 401(k) participants do nothing. I can tell you that in the TIAA-CREF universe, which is mostly academic, the median number of asset allocation changes over the lifetime was zero. More than half never changed. Sixty percent of the people never changed. That's true in most places. Most of the people are doing nothing. There is enormous inertia in these plans. What we see in our data set is old participants are mostly in the plans that existed a long time ago, and new participants are much more likely to be in the plan options that have been recently added.

From the Floor: Would you expect that to carryover to mutual funds and variable annuities?

Dr. Thaler: No, the people who have taken the trouble to take some money and invest it are already in a different category in terms of wealth and sophistication. The typical middle-class, high-school-graduate, 401(k) participant is doing nothing. My guess is the participant will continue to do nothing for quite a while. If we have some cataclysmic event, this may change, but I'm not expecting much.

In response to your second question regarding threshouts for bailout, let me reiterate something I said before. I think that market outcome will depend on when in the year they happen and what kind of year we're having. I think a 25% correction that occurs at the beginning of a year or during a year where the market ends down 25% will have more of an impact than past corrections where investors saw a 30% run-up and a 25% rundown. People are still looking at broadening. We are seeing investors running out into emerging markets. A 50% or 75% drop is enough to scare people. Of course, that could happen in the U.S. It has happened in Japan.

In terms of who's the naive and who's the savvy investor, who knows? Everybody looks naive right now except the people who are buying the S&P 500 index. Over the last three years, the index has performed better than 90% of the active managers. It is partially because of this funny-size thing that's going on. Basically 20 stocks are beating everything else. Unless you're willing to put a quarter of your portfolio in Microsoft, your portfolio will end up being underweighted in Microsoft. So I don't know how the smart money is.

From the Floor: My question has to do with the possible difference between solitary and collective decisions. That was suggested by the discussion with respect to the contest for the airline tickets. The choice of 100, if done collectively among the group that had already agreed somehow to split the returns, might be the most rational choice based on selected levels. You even referred to it as an attempt to move the market. That led me to ask if you've investigated any of these contexts. What is the difference between individuals making solitary versus collective decisions on allocation?

Dr. Thaler: I know one of those groups of students put in answers of about 25, 99, 100 and then an answer of two. So I would say that was not individually or collectively rational.

From the Floor: One aspect of psychology, in which I'm always interested, is the concept of gurus. You mentioned Jeremy Siegel, who, at least in a certain part of the educated population, has become somewhat of a guru. To what extent is an educated guru who gives you something that corresponds to the current environment likely to be an influenced person? I'll give you the example. If Jeremy Siegel had written this book in 1940, when people's recent experience had been very negative (stocks basically didn't earn anything between 1929 and 1947 or 1953), depending on what market you're looking at, would people listen to him as a guru and would people say that's rational? John Boggle, the chairman of Vanguard, says people in a supply/demand philosophy have had stocks go up much more rapidly. Therefore, if the future increases, since we're talking about growth over

time, it will average around 10%. Recent increases have been around 30%, so the return over the next 20 years will be less. People do not seem to listen to him in an environment where people haven't seen a reinforcement. So my questions are, who is the guru, what can we really learn about these things, and what does it mean in psychology in terms of investments?

Dr. Thaler: I wrote one article with Jeremy Siegel. I am a big fan of Jeremy; however, I seriously doubt that he's moving the market very much. I think that he was lucky to publish the first edition of his book before the markets starting going up 25% a year. It made him look like a genius.

We all know there was a period of almost 20 years when the stock market did absolutely nothing, and his book wouldn't have seemed so brilliant at that time. So if he had published that book in 1995, it would have taken him a long time to sell five books.

I'm going to answer a different question. What is the equity premium now? I would say it's more like 2% or 3% than 6% or 7%. Six or seven percent is the historic level. Certainly, when the Dow is at 9000, anybody who thinks they're getting 7% premium is misled. It just can't happen. The arithmetic doesn't work. I still have all of my retirement money in stocks because, to me, 2% or 3% is better than nothing, and I know I'm not smart enough to be a market timer. But I also am not dumb enough to think that I'm going to get 20% a year until I retire. Where is that money coming from?

From the Floor: I think there's a general concern about the liability of some of the existing social insurance programs. People are anticipating that the retirement ages are going to have to be increased or the benefits will need to be capped in order to make them sustainable. Younger people don't seem to be saving more. There is a perception that they'll be able to retire early and live a very good life. It doesn't strike me that these thoughts are internally consistent; perhaps they aren't rational.

Dr. Thaler: Most of the studies I've seen suggest that people aren't saving enough. One of the topics I've written is about the economics of self-control. Economic models of savings assume that people save just the right amount and have no trouble doing that. That doesn't resemble anybody I know. I don't think people are saving enough.

What's true is the amount people save is largely determined by the situation they're in. If you look at the typical portfolio on a middle-class household when they retire, it consists of their social security benefits, their pension benefits, their home equity

if they own a house, and virtually nothing else. The amount that people save on their own, typically, is less than one year's income, which, obviously, isn't going to get you very far.

The 401(k) plans and other mechanisms in that ilk are the answer in my book because they don't involve self-control. All you have to do is get people to sign up once and then they're oblivious. I think there are many things people can do to increase the participation rate in these plans. In my book, that's the most promising solution to the undersaving problem in the U.S.