Behavioral Economics (3050B-0809)

Course Manual

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Abstract

The traditional model of the homo oeconomicus is ubiquitous in microeconomic theory. Economic agents are assumed to be rational self-regarding utility maximizers with unlimited processing capacity, unlimited memory, without emotions, and with perfect foresight. Common sense and the results of experiments show that this is hardly the case. Often, people behave differently than predicted by theory. In the course we will deal therefore with the following problem statements:

1. When does microeconomic theory apply (we concentrate mainly on individual decision making under risk, simple social interactions, and financial markets) and when do we have to be cautious in applying it?

2. If it does not apply what concepts can be used to either extend or to substitute current theory in order to describe human behavior?

Course Manual 3050B-0809
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1 Introduction

In March 2006, the Harvard Magazine published an introductory article on Behavioral Economics by Craig Lambert (the deputy editor of this magazine) where the nature of this young discipline is described in a very intuitive way. The following text is an almost complete copy of this article (The Marketplace of Perception).

Like all revolutions in thought, this one began with anomalies, strange facts, odd observations that the prevailing wisdom could not explain. Casino gamblers, for instance, are willing to keep betting even while expecting to lose. People say they want to save for retirement, eat better, start exercising, quit smoking - and they mean it - but they do no such things. Victims who feel theyve been treated poorly exact their revenge, though doing so hurts their own interests.

Such perverse facts are a direct affront to the standard model of the human actor -homo oeconomicus-that classical and neoclassical economics have used as a foundation for decades, if not centuries. Economic Man makes logical, rational, self-interested decisions that weigh costs against benefits and maximize value and profit to himself. The homo oeconomicus is an intelligent, analytic selfish creature who has perfect self-regulation in pursuit of his future goals an is unswayed by bodily states and feelings. And the homo oeconomicus is a marvelously convenient pawn for building academic theories. But the homo oeconomicus has one fatal flaw: he does not exist.

When we turn to actual human beings, we find, instead of robot-like logic, all manner of irrational, self-sabotaging, and even altruistic behavior. This is such a routine observation that it has been made for centuries; indeed, Adam Smith "saw psychology as a part of decision-making," says assistant professor of business administration Nava Ashraf. "He saw a conflict between the passions and the impartial spectator."

Nonetheless, neoclassical economics side-lined such psychological insights. As recently as 15 years ago, the sub-discipline called behavioral economics-the study of how real people actually make choices, which draws on insights from both psychology and economics-was a marginal, exotic endeavor. Today, behavioral economics is a young, robust, burgeoning sector in mainstream economics, and can claim a Nobel Prize, a critical mass of empirical research, and a history of upending the neoclassical theories that dominated the discipline for so long.

Although behavioral economists teach at Stanford, Berkeley, Chicago, Princeton, MIT, and elsewhere, the subfields greatest concentration of scholar is at Harvard. "Harvards approach to economics has traditionally been somewhat more worldly and empirical than that of other universities," says President Lawrence H. Summers, who earned

his own economics doctorate at Harvard and identifies himself as a behavioral economist. "And if you are worldly and empirical, you are drawn to behavioral approaches."

1.1 Framing a new Field

Two non-economists have won Nobel Prizes in economics. As early as the 1940s, Herbert Simon of Carnegie Mellon University put forward the concept of "bounded rationality," arguing that rational thought alone did not explain human decision-making. Traditional economists disliked or ignored Simons research, and when he won the Nobel in 1978, many in the field were very unhappy about it.

Then, in 1979, psychologists Daniel Kahneman of Princeton and Amos Tversky of Stanford published "Prospect Theory: An Analysis of Decision under Risk," a breakthrough paper on how people handle uncertain rewards and risks. In the ensuing decades, it became one of the most widely cited papers in economics. The authors argued that the ways in which alternatives are framed-not simply their relative value-heavily influence the decisions people make. This was a seminal paper in behavioral economics; its rigorous equations pierced a core assumption of the standard model-that the actual value of alternatives was all that mattered, not the mode of their presentation ("framing").

"Kahneman and Tversky (his longtime collaborator who died in 1996) started this revolution in economics," says Straus professor of business administration Max Bazerman, who studies decision making and negotiation at Harvard Business School. "That 1979 paper was written on the turf of economics, in the style of economists, and published in the toughest economic journal, Econometrica. The major points of prospect theory arent hard to state in words. The math was added for acceptance, and that was important." In 2002, Kahneman received the Nobel Prize in economics along with Vernon Smith, Ph.D. 55, of George Mason University, who was honored for work in experimental economics.

In the 1980s, Richard Thaler (then at Cornell, now of the University of Chicago Graduate School of Business) began importing such psychological insights into economics, writing a regular feature called "Anomalies" in the Journal of Economic Perspectives (later collected in his 1994 book, The Winners Curse) "Dick Thaler lived in an intellectual wilderness in the 1980s," says professor of economics David Laibson, one of Harvards most prominent behavioral economists. "He championed these ideas that economists were deriding. But he stuck to it. Behavioral approaches were anathema in the 1980s, became popular in the 1990s, and now were a fad with lots of grad students coming on board. Its no longer an isolated band of beleaguered researchers fighting

against the mainstream."

As with most movements, there were early adopters. "In the 1980s the best economists in the world were seeing the evidence and adopting it [behavioral economics]," Bazerman says. "Mediocre economist follow slowly -they continued to ignore it so they could continue doing their work undisturbed."

To be fair, the naysayers would have agreed that the rational model only approximates human cognition -"just as Newtonian physics is an approximation to Einsteins physics," Laibson explains. "Although there are differences, when walking along the surface of this planet, youll neve encounter them. If I want to build a bridge, pass a car, or hit a baseball, Newtonian physics will suffice. But the psychologists said, "No, its not sufficient, were not just playing around at the margins, making small change. There are big behavioral regularities that include things like imperfect self-control and social preferences, as opposed to pure selfishness. We care about people outside our families and give up resources to help them - those affected by Hurricane Katrina, for example."

Much of the early work in behavioral economics was in finance, with many significant papers written by Jones professor of economics Andrei Shleifer. In financial markets, "The usual arguments in conventional economics are, This [behavioral irrationality] cant be true, because even if there are stupid, irrational people around, they are met in the marketplace by smart, rational people, and trading by these arbitrageurs corrects prices to rational levels," Shleifer explains. "For example, if people get unduly pessimistic about General Motors and dump GM shares on the market, these smart people will sweep in and buy them up as undervalued, and not much will happen to the price of GM shares."

But a 1990 paper Shleifer wrote with Summers, "The Noise Trader Approach to Finance," argues against this "efficient market" model by noting that certain risk-related factors limit this arbitrage. At that time, for example, shares of Royal Dutch were selling at a different price in Amsterdam than shares of Shell in London, even though they were shares of the same company, Royal Dutch/Shell. Closed-end mutual funds (those with a fixed number of shares that trade on exchanges) sell at different prices than the value of their portfolios. "When the same thing sells at two different prices in different markets, forces of arbitrage and rationality are necessarily limited," Shleifer says. "The forces of irrationality are likely to have a big impact on prices, even on a long-term basis This is a theoretical attack on the central conventional premise."

Meanwhile, the Russell Sage Foundation, which devotes itself to research in social sciences, consistently supported behavioral economics, even when it was in the intellectual wilderness. Current Sage president Eric Wanner, Ph.D. 69, whose doctorate is in

social psychology, was running a program in cognitive science at the Alfred P. Sloan Foundation in 1984 when Sloan started a behavioral economics program as an application of cognitive science to the study of economic decision-making. ("The field is misnamed - it should have been called cognitive economics," says Wanner. "We werent brave enough.") After Wanner became president of Russell Sage in 1986, the two institutions worked jointly to foster the new subfield. In the last 20 years, Sage has made well over 100 grants to behavioral economists; it also organizes a biennial summer institute that has drawn younger scholars like Laibson and professor of economics Sendhil Mullainathan. Princeton University Press and Russell Sage also co-publish a series of books in the field.

Behavioral economics, then, is the hybrid offspring of economics and psychology. "We dont have much to tell psychologists about how individuals make decisions or process information, but we have a lot to learn from them," says Edward Glaeser. "We do have a lot to say about how individuals come together in aggregations-markets, firms, political parties."

1.2 The Seductive Now-Moment

A national chain of hamburger restaurants takes its name from Wimpy, Popeyes portly friend with a voracious appetite but small exchequer, who mad famous the line, "Ill gladly pay you Tuesday for a hamburger today." Wimpy nicely exemplifies the problems of "intertemporal choice" that intrigue behavioral economists like David Laibson. "Theres a fundamental tension, in humans and other animals, between seizing available rewards in the present, and being patient for rewards in the future," he says. "Its radically important. People very robustly want instant gratification right now, and want to be patient in the future. If you ask people, Which do you want right now, fruit or chocolate? they say, Chocolate! But if you ask, Which one a week from now? they will say, Fruit. Now we want chocolate, cigarettes, and a trashy movie. In the future, we want to eat fruit, to quit smoking, and to watch Bergman films."

Laibson can sketch a formal model that describes this dynamics. Consider a project like starting an exercise program, which entails, say, an immediate cost of six units of value, but will produce a delayed benefit of eight units. Thats a net gain of two units, "but it ignores the human tendency to devalue the future," Laibson says. If future events have perhaps half the value of present ones, then the eight units become only four, and starting an exercise program today means a net loss of two units (six minus four). So we dont want to start exercising today. On the other hand, starting tomorrow devalues

both the cost and the benefit by half (to three and four units, respectively), resulting in a net gain of one unit from exercising. Hence, everyone is enthusiastic about going to the gym tomorrow. Broadly speaking, "People act irrationally in that they overly discount the future," says Bazerman. "We do worse in life because we spend too much for what we want now at the expense of goodies we want in the future. People buy things they cant afford on a credit card, and as a result they get to buy less over the course of their lifetimes." Such problems should not arise, according to standard economic theory, which holds that "there shouldnt be any disconnect between what Im doing and what I want to be doing," says Nava Ashraf. Luckily, Odysseus also confronts the problem posed by Wimpy - and Homers hero solves the dilemma. The goddess Circe informs Odysseus that his ship will pass the island of the Sirens, whose irresistible singing can lure sailors to steer toward them and onto rocks. The Sirens are a marvelous metaphor for human appetite, both in its seductions and its pitfalls. Circe advises Odysseus to prepare for temptations to come: he must order his crew to stopper their ears with wax, so they cannot hear the Sirens songs, but he may hear the Sirens beautiful voices without risk if he has his sailors lash him to a mast, and commands them to ignore his pleas for release until they have passed beyond danger. "Odysseus pre-commits himself by doing this," Laibson explains. "Binding himself to the mast prevents his future self from countermanding the decision made by his present self."

Pre-commitments of this sort are one way of getting around not only the lure of temptation, but our tendency to procrastinate on matters that have an immediate cost but a future payoff, like dieting, exercise, and cleaning your office. Take 401(k) retirement plans, which not only let workers save and invest for retirement on a tax-deferred basis, but in many cases amount to a bonanza of free money: the equivalent of finding "$100 Bills on the Sidewalk" (the title of one of Laibsons papers, with James Choi and Brigitte Madrian). Thats because many firms will match employees contributions to such plans, so one dollar becomes two dollars. "Its a lot of free money," says Laibson, who has published many papers on 401(k)s and may be the worlds foremost authority on enrollment in such plans. "Someone making $50,000 a year who has a company that matches up to 6 percent of his contributions could receive an additional $3,000 per year."

The rational model unequivocally predicts that people will certainly snap up such an opportunity. But they dont - not even workers aged 59 1/2 or older, who can withdraw sums from their 401(k) plans without penalty. (Younger people are even more unlikely to contribute, but they face a penalty for early withdrawal.) "It turns out that about half of U.S. workers in this [above 59 1/2] age group, who have this good deal available, are not contributing," says Laibson. "Theres no downside and a huge upside. Still,

individuals are procrastinating - they plan to enroll soon, year after year, but dont do it." In a typical American firm, it takes a new employee a median time of two to three years to enroll. But because Americans change jobs frequently -say, every five years - that delay could mean losing half of ones career opportunity for these retirement savings.

Laibson has run educational interventions with employees at companies, walking them through the calculations, showing them what they are doing wrong. "Almost all of them still dont invest," Laibson says. "People find these kinds of financial transactions unpleasant and confusing, and they are happier with the idea of doing it tomorrow. It demonstrates how poorly the standard rational-actor model predicts behavior."

Its not that we are utterly helpless against procrastination. Laibson worked wit a firm that forced its employees to make active decisions about 401(k) plans, insisting on a yes or no answer within 30 days. This is far different from giving people a toll-free phone number to call whenever they decide to enroll. During the 30-day period, the company also sent frequent e-mail reminders, pressuring the staff to make their decisions. Under the active-decision plan, enrollment jumped from 40 to 70 percent. "People want to be prudent, they just dont want to do it right now," Laibson says. "Youve got to compel action. Or enroll people automatically."

When he was U.S. Treasury Secretary, Lawrence Summers applied this insight. "We pushed very hard for companies to choose opt-out [automatic enrollment] 401(k)s rather than opt-in [self-enrollment] 401(k)s," he says. "In classical economics, it doesnt matter. But large amounts of empirical evidence show the defaults do matter, that people are inertial, and whatever the baseline settings are, they tend to persist."

1.3 Marketing Prudence

These insights can also be written large. Laibsons former student Nava Ashraf, who has worked extensively with nongovernmental organizations, is now applying behavioral economics to interventions in developing countries. She lived for a year in Ivory Coast and Cameroon, where she "noticed that farmers and small-business owners were often not doing the things that a development policymaker or economist thinks they should do," she says. "They wouldnt take up technologies that would increase agricultural yield, for example. They wouldnt get vaccines, even though they were free! They also had a lot of trouble saving. In January they had a lot of money and would spend it on feasts and special clothes, but in June their children would be starving."

Still, some found ways to offset their less-than-prudent tendencies. One woman had a cashbox in her home, where she saved money regularly - and gave her neighbor the

only key. Another timed the planting of her sweet-potato crop so that the harvest would come in when school fees were due. Her farm became an underground bank account that allowed withdrawal only at the proper moment.

Ashraf worked with a bank in the Philippines to design a savings plan that took off from the African womans cashbox. The bank created a savings account, called SEED ("Save, Earn, Enjoy Deposits"), with two features: a locked box (for which the bank had the key) and a contractual agreement that clients could not withdraw money before reaching a certain date or sum. The clients determined the goal, but relied on the bank to enforce the commitment. The bank marketed the SEED product to literate workers and micro-entrepreneurs: teachers, taxi drivers, people with pushcart businesses.

The SEED box, designed to appeal to the banks clients ("In the Philippines, they like cute stuff," Ashraf explains), helped mobilize deposits. "Its similar to automatic payroll deduction, but not enough of the customers had direct deposit to make that work," she says. To further encourage deposits, Ashraf worked with the bank on an additional program of deposit collectors who, for a nominal fee, would go to the customers home on a designated day and collect the savings from the SEED box. The withdrawal restrictions on the account helped clients avoid the temptation of spending their savings. The SEED savings account made a designed choice available in the marketplace that, so far, has helped a growing number of microfinance clients in the Philippines reach their savings goals.

Ashraf is now working with Population Services International - a nonprofit organization that seeks to focus private-sector resources on the health problems of developing nations - on a project in Zambia to motivate people to use a water purification solution known as Clorin. "We can use what marketing people have known all along," Ashraf says. "There are ways of manipulating peoples psychological frameworks to get them to buy things. How do you use this knowledge to get them to adopt socially useful products or services? Its so practical, and very important in development, for anybody who wants to help people reach their goals."

Carefully designed programs like the SEED bank are examples of what Richard Thaler called "prescriptive economics," which aims not only to describe the world but to change it. "Behavioral economics really shines when you talk about the specifics of what the policy should look like," says Sendhil Mullainathan, who received a MacArthur Fellowship in 2002. "The difference in impact between two broad policies may not be as great as differences in how each policy is framed -its deadlines, implementation, and the design of its physical appearance.

"For example, in Social Security privatization," Mullainathan continues, "the differ-

ence between private accounts and the status quo may be less than that between two different ways of implementing private accounts. What is the default option? Are you allowed to make changes? Whats the deadline for making changes? How are the monthly statements presented - just your returns or are the market returns printed alongside your own? In terms of impact, the devil really is in the details of how the program is designed. We know that people have a tough time making these choices. So how are the choices framed. What metrics do they focus on?"

"We tend to think people are driven by purposeful choices," he explains. "We think big things drive big behaviors: if people dont go to school, we think they dont like school. Instead, most behaviors are driven by the moment. They arent purposeful, thought-out choices. Thats an illusion we have about others. Policymakers think that if they get the abstractions right, that will drive behavior in the desired direction. But the world happens in real time. We can talk abstractions of risk and return, but when the person is physically checking the box on that investment form, all the things going on at that moment will disproportionately influence the decision they make. Thats the temptation element - in real time, the moment can be very tempting. The main thing is to define what is in your mind at the moment of choice. Suppose a company wants to sell more soap. Traditional economists would advise things like making a soap that people like more, or charging less for a bar of soap. A behavioral economist might suggest convincing supermarkets to display your soap at eye level -people will see your brand first and grab it."

Mullainatha worked with a bank in South Africa that wanted to make more loans. A neoclassical economist would have offered simple counsel: lower the interest rate and people will borrow more. Instead, the bank chose to investigate some contextual factors in the process of making its offer. It mailed letters to 70,000 previous borrowers saying, "Congratulations! Youre eligible for a special interest rate on a new loan." But the interest rate was randomized on the letters: some got a low rate, others a high one. "It was done like a randomized clinical trial of a drug," Mullainathan explains.

The bank also randomized several aspects of the letter. In one corner there was photo - varied by gender and race-of a bank employee. Different types of tables, some simple, others complex, showed examples of loans. Some letters offered a chance to win a cell phone in a lottery if the customer came in to inquire about a loan. Some had deadlines. Randomizing these elements allowed Mullainathan to evaluate the effect of psychological factors as opposed to the things that economists care about - i.e., interest rates - and to quantify their effect on response in basis points.

"What we found stunned me," he says. "We found that any one of these things had

an effect equal to one to five percentage points of interest! A womans photo instead of a mans increased demand among men by as much as dropping the interest rate five points! These things are not small. And this is very much an economic problem. We are talking about big loans here; customers would end up with monthly loan payments of around 10 percent of their annual income. Youd think that if you really needed the money enough to pay this interest rate, youre not going to be affected by a photo. The photo, cell phone lottery, simple or complicated table, and deadline all had effects on loan applications comparable to interest. Interest rate may not even be the third most important factor. As an economist, even when you think psychology is important, you dont think its this important. And changing interest rates is expensive, but these psychological elements cost nothing."

Mullainathan is helping design programs in developing countries, doing things like getting farmers to adopt better feed for cows to increase their milk production by as much as 50 percent. Back in the United States, behavioral economics might be able to raise compliance rates of diabetes patients, who dont always take prescribed drugs, he says. Poor families are often deterred from applying to colleges for financial aid because the forms are too complicated. "An economist would say, With $50,000 at stake, the forms can be the obstacle," he says. "But they can." (A traditional explanation would say that the payoff clearly outweighs the cost in time and effort, so people wont be deterred by complex forms.) Economists and others who engage in policy debates like to wrangle about big issues on the macroscopic level. The nitty-gritty details of execution - what do the forms look like? what is in the brochures? how is it communicated? - are left to the support staff "But that work is central," Mullainathan explains. "There should be as much intellectual energy devoted to these design choices a to the choice of a policy in the first place. Behavioral economics can help us design these choices in sensible ways. This is a big hole that needs to be filled, both in policy and in science."

1.4 Zero-Sum Persuasion

Andrei Shleifer has already made path-breaking contributions to the literature of behavioral finance (as noted above), political economy, and law and economics. His latest obsession is persuasion - "How people absorb information and how they are manipulated," he says. At the American Economic Association meetings in January, Shleifer described "cognitive persuasion," exploring how advertisers, politicians, and others attach their messages to pre-existing maps of associations in order to move the public in a desired direction. The Marlboro Man, for example, sold filtered cigarettes by mobi-

lizing the publics associations of cowboys and the West with masculinity, independence and the great outdoors. “There is a confirmation bias,” Shleifer explained, which favors persuasive messages that confirm beliefs and connections already in the audiences mind. For example, George W. Bush wearing a $3,000 cowboy hat was not a problem, because it matched his image, but John Kerry riding a $6,000 bicycle was a problem - that luxury item appeared hypocritical for a candidate claiming to side with the downtrodden.

Citing Republican pollster and communications consultant Frank Luntz, Shleifer noted how the estate tax was renamed the “death tax” (although there is no tax on death) in order to successfully sell its repeal. The relabeling linked the tax to the unpleasant associations of the word “death,” and the campaign asked questions like, “How can you burden people even more at this most difficult time in their lives?” “Messages, not hard attributes, shape competition,” Shleifer said; he noted that the fear of terrorism is a bigger issue in probable non-target states like Wyoming, Utah, and Nevada than in New York and New Jersey. Because successful persuasive messages are consistent with prevailing worldviews, one corollary of Shleifers analysis is that persuasion is definitely not education, which involves adding new information or correcting previous perceptions. “Dont tell people, You are stupid, and here is what to think,” Shleifer said. During presidential debates, he asserted, voters tune out or forget things that are inconsistent with their beliefs. “Educational messages may be doomed,” he added. “They do not resonate.” In economic and political markets he said, there is no tendency toward a median taste; divergence, not convergence, is the trend. Therefore, the successful persuader will find a niche and pander to it.

When making choices in the marketplace, “People are not responding to the actual objects they are choosing between,” says Eric Wanner of the Russell Sage Foundation. “There is no direct relation of stimulus and response. Neoclassical economics posits a direct relationship between the object and the choice made. But in behavioral economics, the choice depends on how the decision-maker describes the objects to himself. Any psychologist knows this, but it is revolutionary when imported into economics.

“We are vulnerable to how choices are described,” Wanner explains. “Advertising is a business that tries to shape how people think about their choices. Neoclassical economics can explain ads only as providing information. But if the seller can invest in advertising that frames the choice, that frame will skew the buyers decision. The older economic theories depend on the idea that the successful seller will produce a better product, the market will price the product correctly, and the buyer will buy it at a price that maximizes everyones interest - the market is simply where the buyer and seller come together. But once you introduce framing, you can argue that the buyer may no

longer be acting entirely in his own self-interest if the seller has invented a frame for the buyer, skewing the choice in favor of the seller."

"Then, the model of the market is not simply buyers and sellers coming together for mutually beneficial exchange," Wanner continues. "Instead, the exchange between buyers and sellers has aspects of a zero-sum game. The seller can do even better if he sells you something you dont need, or gets you to buy more than you need, and pay a higher price for it." The classical welfare theorem of Vilfredo Pareto was that markets will make everyone as well off as they can be that the market distribution will be an efficient distribution that maximizes welfare. "But once you introduce framing, all bets are off," Wanner says. A zero-sum game between buyer and seller clearly does not maximize everyones welfare, and hence suggests a different model of the marketplace.

There are many political implications. We have had 30 years of deregulation in the United States, freeing up markets to work their magic. "Is that generally welfare-enhancing, or not?" Wanner asks. "Framing can call that into question. Everyone agrees that theres informational asymmetry - so we have laws that ensure drugs are tested, and truth-in-advertising laws. Still, there are subtle things about framing choices that are deceptive, though not inaccurate. We have the power of markets, but they are places where naive participants lose money. How do we manage markets so that the framing problem can be acknowledged and controlled? Its an essential question in a time of rising inequality, when the well-educated are doing better and the poorly educated doing worse."

Its a question that behavioral economics raises, and, with luck, may also be able to address. The eclipse of hyper-rational homo oeconomicus opens the way for a richer and more realistic model of the human being in the marketplace, where the brain, with all its ancient instincts and vulnerabilities, can be both predator and prey. Our irrationalities, our emotional hot-buttons, are likely to persist, but knowing what they are may allow us to account for them and even, like Odysseus, outwit temptation. The models of behavioral economics could help design a society with more compassion for creatures whose strengths and weaknesses evolved in much simpler conditions. After all, "The world we live in," Laibson says, "is an institutional response to our biology."

2 Position in the Curriculum

This course starts from the fundamentals of microeconomics that have been handed to you earlier in your studies; that is, it presumes a working knowledge of microeconomic theory. Some additional knowledge on game theory might be very helpful.

3 Literature

The handouts corresponding to the classical model of individual decision making under risk and the standard game theoretical equilibrium notions (the two topics of the opening lecture) are available online. Students who want to revise their knowledge with respect to these topics can, alternatively, consult any intermediate microeconomic textbook. The remaining literature of the course will be based on the following research articles, all of them can be downloaded from the eleUM website.

Bolton, G. and Ockenfels, A. (2000), "ERC: A Theory of Equity, Reciprocity, and Competition", American Economic Review, 90, 166-193.

Fehr, E. and Gächter, S. (2000), "Fairness and Retaliation: The Economics of Reciprocity", Journal of Economic Perspectives, 14, 159-181.

Fehr, E. and Schmidt, K. (1999), "A Theory of Fairness, Competition, and Cooperation", Quaterly Journal of Economics, 114, 817-868.

Gigerenzer, G. (2005), "Fast and Fugal Heuristics: The Tools of Bounded Rationality", in: Handbook of Judgment and Decision Making (eds. Koehler, D. and Harvey, N.), Blackwell, Oxford.

Leufkens, K. (2005a), "The Allais Paradox: Common Consequences and Common Ratio Effects", unpublished manuscript.

Leufkens, K. (2005b), "A Simple Model of Inequity Aversion", unpublished manuscript.

Nagel, R. (2000), "Unraveling in Guessing Games: An Experimental Study", American Economic Review, 85, 1313-1326.

Palacios-Huerta (2003), "Professionals Play Minimax", Review of Economic Studies, 70, 395-415.

Plott, C. and Sunder, S. (1982), "Efficiency of Experimental Security Markets with Insider Information: An Application to the Rational Expectations Model", Journal of Political Economy, 90, 663-698.

Starmer, C. (2000), "Developments in Non-Expected Utility Theory: The Hunt for a Descriptive Theory of Choice under Risk", Journal of Economic Literature, 38, 332-382.

Smith, V. and Suchanek, G. and Williams, A. (1988), "Bubbles, Crashes and Endogenous Expectations in Experimental Spot Markets", Econometrica, 56, 1119-1151.

4 Structure

The course is based on 14 meetings of two hours each. The first meeting is a plenary course opening, which recovers some important pillars of neo-classical economics: expected utility theory and the basic game theoretical equilibrium concepts (Nash equilibrium and Subgame Perfect Nash equilibrium).

In 11 of the remaining 13 meetings we will cover some literature and exercises as scheduled below in the Course Agenda. Students are expected to prepare the corresponding literature for discussion in the group. Each meeting is chaired by one member of the group and this job rotates. To facilitate discussion, the chairperson introduces each subject paper very briefly, explaining its main message and perhaps hinting on some criticism already. These summaries are really limited to two or three minutes, no more. After the summary, the chairperson is supposed to guide through the first part of the session. In particular, s/he should (a) present the results of the experiment from the previous session (the whole group has to comment upon these results although most of the times only the chair-person is supposed to analyze the data) and (b) lead the discussion on the literature. To facilitate this work, we prepare for every meeting a list with questions. However, the discussion should not be reduced to the questions we propose, intelligent additional questions and comments are an important input.

Moreover, each group member is held to prepare solutions to the occasional exercises that you can also find in the problem list. These exercises are mainly mathematically formulated. They form an indispensable part of a good training and add substantially to your understanding of the course subject. It is of prime importance to spend time on solving them, also in preparation for your exam. The exercises will be dealt with in the second part of the meeting and each group member is supposed to be able to present her/his solution to the others. The tutor is then supposed to control the proposed solution and help in case of problems. However, it is not her/his work to simply present the correct solution.

In the last part of a meeting (about 15 minutes), the tutor will introduce a new topic by means of an experiment (the results will then be discussed in the next meeting). Meetings 10 and 13 are special, because in these sessions we will show how more complicated questions can be analyzed by means of computer experiments.

Meeting	**Subject and Literature**	**Exercises**	**Experiment**
0 (02.09)	*Course Opening* Block Book	none	Lotteries
1 (05.09)	*Expected Utility Theory* Handout on Decision Making under Risk	List 1	A Market Game
2 (09.09)	*Non-Expected Utility Theory -1-* Starmer (2000) Section 1-4	List 2	none
3 (12.09)	*Non-Expected Utility Theory -2-* Starmer (2000) Section 5-8	List 3	Coordination
4 (16.09)	*Heuristics* Gigerenzer (2005)	List 4	Centipede Game
5 (19.09)	*Basic Concepts of Game Theory* Handout on Game Theory	List 5	Ultimatum Game
6 (23.09)	*Social Preferences: Inequity Aversion* (a) Bolton & Ockenfels (2000) Sec. 1-3 (b) Fehr & Schmidt (1999) Sec. 1-4	List 6	Public Goods
7 (26.09)	*Social Preferences: Reciprocity* Fehr & Gächter (2000)	List 7	Guessing Game
8 (30.09)	*Behavioral Beliefs* Nagel (2000)	List 8	Randomization
9 (03.10)	*Equilibria in Mixed Strategies* Palacios-Huerta (2003)	List 9	none
10 (07.10)	*Experimental Laboratory*	none	Behavioral Finance
11 (10.10)	*Bubbles in Experimental Asset Markets* Smith et al. (1988)	List 10	Double Auction
12 (14.10)	*Rational Expectations Equilibria* Plott & Sunder (1982)	List 11	none
13 (17.10)	*Experimental Laboratory*	none	Asset Pricing

5 Grading Policy

The main evaluation criterion of this course is a written exam, which counts for 70% of the final grade. Participation in the group discussions on issues and exercises makes up for 30%. The passing requirement is 4.5 for each of them separately (exam and participation) and 5.5 in the weighted average. The evaluation of your participation will be based on: your presence, both physically and mentally, which is expected in every session; your contributions to solving the exercises; your contribution in the discussions; and your performance as chairperson. The final exam will be a written exam, of the closed book type. This means you cannot bring any kind of material to the exam, apart from a non-programmable calculator. The exam will test both, overview of the subjects covered in the course, and depth of understanding. This is done through a series of knowledge and essay questions, and several mathematically constructed exercises. The level of the literary questions is comparable to the discussion issues. The exercise questions compare with the exercises solved in the course. Additionally, the final grade can be increased by performing well in the experiments during the meetings. This works as follows: You can obtain for your participation in every experiment at most 10 points and since there is a total of 11 (eleven) experiments, you can score at most 110 points. The points you actually obtain are summed up and divided by 110 in order to calculate your percentage score. If your percentage score is x, the final grade increases by $x/10$ (i.e. if a student scores 70% of all possible points, the final grade increases by 0.7). It should however be noted that this incremental cannot not be used for compensation; that is, if the weighted average of the exam grade and the participation grade is below 5.5, the course is failed independently of the performance in the experiments.

6 Contact Information

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