

Free Markets and Fettered Consumers

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ABSTRACT:

Are consumers sufficiently self-interested and self-reliant so that privatized markets deliver the efficiency and welfare gains they promise? Why are consumers uncomfortable in markets, and in some case sufficiently opposed to market solutions to prevent their implementation? What can be done to prepare consumers so that they function satisfactorily in markets, and understand the advantages of market-based resource allocation? This paper examines the foundations of consumer behavior and attitudes in markets, and proposes a program of scientific research to determine how consumers cope in privatized markets, and the implications for market design of the limits of self-reliance.

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Daniel McFadden¹

"You cannot simply tell a person in dire need, wait for the market to take care of you. That is a most callous thing to say, and only makes a person feel owned, and with no control over his life."

Letter to the Editor, NY Times, 2005

"[I]t is not enough to simply liberate people and assume that they will automatically pursue economic prosperity. People need to be instilled with certain beliefs, like the belief that ... individuals have the power to shape their own destiny. ... It's important to understand the beliefs than encourage people to work hard and grow rich."

David Brooks, NY Times, 2005

1. Consumers and Markets. Economic theories and ideologies are founded on the principle that consumers have well-defined preferences, and consistently behave to advance their self-interest. Jeremy Bentham (1789) said "My notion of man is that ... he aims at happiness ... in every thing he does." Herb Simon (1956) said "The rational man of economics is a maximizer, who will settle for nothing less than the best." Some economists have even taken self-interest to tautologically explain choice:

"An article can have no value unless it has utility. No one will give anything for an article unless it yield him satisfaction. Doubtless people are sometimes foolish, and buy things, as children do, to please a moment's fancy; but at least they think at the moment that there is a wish to be gratified. Doubtless, too, people often buy things which, though yielding pleasure for the moment, or postponing pain, are in the end harmful. But here ... we must accept the consumer as the final judge. The fact that he is willing to give up something in order to procure an article proves once for all that for him it has utility, – it fills a want."

Frank Taussig, 1912

Consumers who know their own tastes, and are relentlessly self-interested and self-reliant, relish choice, and welcome market opportunities that expand their options. Most economists accept this concept of the consumer, and the attendant economic theory that demonstrates the efficiency and Pareto optimality of decentralized, competitive markets.

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Over the past thirty years in the United States and elsewhere, these market-oriented views have driven economic policy, leading to deregulation of air and truck transportation, telecommunications, and energy markets, establishment of property rights and markets to manage environmental externalities, and globalization of international markets for goods, capital, and services. Notable successes were deregulation of truck and air transportation, and of telecommunications, where dysfunctional regulation worked at cross-purposes to competition. Another success was making air pollution a property right, allowing Coasian markets to internalize environmental externalities. There have also been striking failures, such as the breakdown of the incompletely deregulated energy market in California a few years ago, the rail transport deregulation in Great Britain that got wrong the incentives for track maintenance, and the British system of private retirement accounts that allowed excessive fees and overselling. However, the sweep of decentralization and privatization is, I believe, widely viewed by economists as an almost universal success, with the failures due to correctable flaws in market design. Romantics of the economic right would carry the concepts of self-interested consumers and free markets even further, embracing a withering of authority and a nirvana of Hayekian self-reliance.

Most reasoned discussions of privatization among economists concentrate on information asymmetries, incentives, economies of scale and scope, and risk management, and the relative efficiency and sustainability of alternative forms of market organization. There are serious economic questions as to whether, for example, the technologies of network industries can sustain decentralized competitive organization, or will support only concentrated industries with an attendant loss of choice and efficiency. There are serious questions as to whether adverse selection will defeat the efficiency gains from competition in multiple-payer privatized insurance markets. It is a worthy scientific enterprise to study these issues, and look to the historical record of privatization for answers, but not one that I will take up in this paper. I will concentrate instead on the decision-making of consumers, the market outcomes they achieve as a result, and the influence of these outcomes on their attitudes toward markets.

We see in the general public widespread unease about market solutions. Free trade and globalization, privatization of social insurance, and deregulation of energy markets all elicit opposition from many consumers, sometimes reasoned but often inchoate. It is no coincidence that support for market solutions is concentrated among the economically successful, and opposition among the less successful. Free choice has moral appeal, but moral fiber is strongest when not cut by self-interest. Market mechanisms have to compete for votes with alternative resource allocation schemes more favorable to the underdogs; and in this competition, fairness to me is my primary concern, efficiency is someone else's problem. In addition, there is ideological opposition to market solutions. In the liberal orthodoxy, markets are dominated by the powerful and rapacious, and the motives of government bureaucrats are purer than those of private bureaucrats. In this ideology, the *process* of privatization often serves the interests of the politically connected. The Enrons and Haliburtons of this world reinforce these views. However, ideologies themselves are woven from human sentiments, and antipathy to market solutions is more than just doctrine.

My concern in this paper is that it is not enough to find ways to handle information and technology issues in privatization if consumers are not up to the task of functioning satisfactorily in such markets. The argument is not that consumers should be coddled; they may need to see the stick to get the incentives for self-reliance right. However, the efficiency and stability of an economy requires that all consumers be part of the franchise, in reality and in perception, so that good economic policies, including privatization and free markets when they make sense, receive broad support. I will discuss these issues at two levels. First, I will give a selective review of the behavioral evidence on consumer decision-making, and how this influences market outcomes and attitudes toward markets. Second, I will summarize results that my research group has obtained on a current, concrete privatization issue, the new Medicare Part D prescription drug program, which is offering market choices within a social insurance program. I will ask whether consumers are in fact able to manage their choices adequately in this new market, and whether they will in fact gain from the added choice offered by privatization. The following fundamental questions,

explored in pioneering papers by Choi, Laibson, Madrian, and Metrick (2003) and Thaler and Sunstein (2003), comprise an important scientific agenda:

- Are consumers sufficiently consistent in advancing their own self-interest in specific markets to achieve the levels of efficiency and well-being that privatization promises?
- What can be done as part of the design of privatization, such as information, instruction, and support structures, to help consumers satisfactorily pursue their own self-interest?
- When privatization is in consumers' self-interest, how can they be enlightened and convinced to support the change?

2. The Challenge of Choice.

Agoraphobia (αγορά + φόβος,, literally "fear of the marketplace") Fear of leaving a safe place, fear of being in situations from which escape might be difficult or embarrassing; fear of losing control in a public place such as a restaurant or shopping mall. Psychology Today

Studies of consumer perceptions, motivations, and behavior give a complex picture of self-interest and the determinants of well-being. Consumers often find choice overwhelming, and decision-making uncomfortable. In the words of a Dutch proverb, "He who has choice has trouble." We routinely use procrastination, pre-commitments, habit, imitation, social norms, defaults, and superstitions to avoid confronting choice. We pass up trading opportunities, particularly in unfamiliar situations. We are suspicious of trading partners, and fearful of deception, exploitation, or unfair treatment. In short, we exhibit various degrees of *agoraphobia*, a term that means literally "fear of the marketplace", adapted by psychiatrists to mean fear of leaving a safe place for a situation from which it might be difficult or embarrassing to escape. Reflect on the major decisions in your own lives, choice of college, occupation, car, house, and spouse, and in most cases you will feel you made the right choice, but will recall the choice process itself as an emotional, stressful experience.

By rational calculation and accumulated experience, we benefit from choice. Then, why do consumers fear markets and find choice troubling? First, there is market risk. Forget the antiseptic, well-lighted budget sets and markets of economics textbooks. Real-life markets are rough, murky, tumultuous places where commodity attributes shift, supply is uncertain, prices volatile, and information imperfect. *Caveat emptor* prevails, and caution and calculation are vital. The sure-footed may thrive, but their success may come in part from the failures of the less experienced and nimble. Second, there are personal risks, including the risk of misperception and miscalculation, of misunderstanding the available alternatives, of misreading one's own tastes, of yielding to a moment's whim and regretting it afterwards. Finally, there is social risk, the interactions between people that trade requires, the stress of information acquisition, search, and bargaining, the stress of dealing with pushy or deceptive sales tactics, and the risk of being embarrassed or defrauded.

How do consumers deal with these risks? And what is it about these risks that lead to broad biases against market-based resource allocation? Perhaps such inference is rooted in human psychology. Consumers often have the perceptual illusion that other freeway lanes or supermarket lines move faster than their own, because the occasions on which this occurs are particularly noticeable and irritating. Similarly, they may have the perceptual illusion that they are particularly unlucky, or subject to discrimination and exploitation in markets, because their bad experiences stand out. Markets that work well for you are invisible, those that don't are a source of frustration and grief.

3. The Consumer's Mind.

"What if everything is an illusion and nothing exists? In that case, I definitely overpaid for my carpet."
Woody Allen

To understand how consumers deal with market, personal, and social risks, it is useful to study how they think, and the social context of thought and trade. While the mutual benefit of trade is the aspect emphasized in economics, trade is also a contest, with the

issues, emotions, and stresses that competitions entail: Is the playing field level and the referee fair? Will my opponent play by the rules? Can I match her knowledge and skills? The competition itself, not just the outcome, becomes a source of pleasure or pain. Trade is part of the way that humans as social animals define and defend themselves, a process that is both cognitive and visceral.

Mind and trade are linked in human prehistory. I relate an evolutionary tale, adapted from Matthew Ridley's book *The Origins of Virtue*. A few million years ago, the great apes had established family groups that were successful in the essentials, obtaining food, protecting themselves from predators, and reproducing. In common with other animals, they evolved a sense of personal space sufficient to provide some defense against attack, and a system of trust and reputation that allowed them to suspend their "fight or flee" defenses and live together with family members. These spatial social interactions had a physiological basis – reward pathways in the brain and neurotransmitters that facilitated social contact, reciprocity, and mutual aid. Some of these apes discovered that through division of labor, specialization, and trade, they could be more productive and fertile, and live better and longer. But trade, particularly outside the family group, was risky business. To get close enough to a stranger to trade flints for firs, one had to risk being attacked. The most successful apes dealt with this by developing the ability to form bonds of trust over larger social groups than the family. This was accomplished by adapting the brain's visceral reward pathways that already allowed family units to function. Second, these apes developed analytic, social, and communication skills that allowed them to operate in larger social and economic groups. These were cerebral activities, and evolution selected species with more cerebral capacity. Among these apes were our ancestors. They gave us large brains, with the capacity to explore the corners of our universe, and to engage in sophisticated economic activities. They also gave us an emotional reward system that processes economic actions in much the same visceral way that it processes personal interactions, when to approach and when to avoid, whom to trust, and when to form personal or professional bonds.

The evolutionary tale I have just told is speculation, based on observations of contemporary apes and other animals, and fossil records. However, the role of trust and reward pathways in the brain, and how they affect economic conduct, is something that we can investigate experimentally, using the tools of brain science and the new discipline of neuroeconomics to study the processing of economic choice problems at a physiological level. Brain measurements include maps of energy consumption, observed under experimental treatments that alter electrochemistry and cognitive task. These measurements fall short of Edgeworth's wistful call in 1881 for a hedonimeter to record pleasure, but they provide some insight into the sensations that economists call utility.

The early biologists observed that as the human embryo developed, it seemed to go through stages of evolution, from a simple one-celled creature to its complex final form. That view was superficial, but it does seem to be the case that human physiology, and in particular, the structure of the brain, is consistent with a layering of added functionality over a simpler and more primitive core. The aspects of brain function that we identify with being human – language, the cognitive processes of deduction and induction, the ability to empathize and interact with others, are primarily sited in frontal lobe of the cerebrum, the outer layer of the brain whose relative size and complexity in humans differentiate us from most other species. The more primitive limbic system, buried at the base of the cerebrum, is heavily involved in emotion and the reward pathways associated with sensations of pain and pleasure. The limbic system is active in animal behavior at a visceral level: approach and avoidance, foraging, territory, and reproduction. The electrochemistry of the limbic system is similar in all animals, and on the evolutionary scale clearly predates human development.

Most people think of economic activity as quite cerebral, learned through lengthy education and shaped by culture. If the brain is the hardware, then the utilitarian calculus might be pictured as software, an operating system that is stored and run at various, possibly-relocatable hardware sites, and is modified, Linux-like, by experience and selection. In this view, monitoring the brain can tell you something about the burden the software places on the hardware, but relatively little about what the software is doing.

However, the picture that is now emerging is that economic behavior, like the brain itself, has layers. Working a spreadsheet to balance a retirement portfolio is indeed a high-level, learned skill. However, economic trading also seems to involve relatively primitive circuits in the limbic system. Therefore, you should not be surprised to learn that brain hardware is associated with economic decisions in a substantial and relatively direct way. Specifically, the limbic system and its reward pathways qualify as the brain's primary center for recording pleasure, and are active when we are involved in matters of threat, trust, sex, and economic trade.² If you have ever dismayed over convincing students that economics is a sexy subject, you can now tell them that shopping and sex share the same neurotransmitters and receptors.

The linkages from physiological sensation to conscious interpretation and reasoning may be complex, and physiology alone may give an incomplete picture, just as computer hardware monitoring gives an incomplete picture of what software is doing. Nevertheless, it should be clear that any ability to measure directly in the brain the impact of economic choice tasks on reward pathways is potentially an immensely powerful tool for linking economic activities and consumer well-being.

How do organisms process sensations of pleasure and pain? The answer goes directly to the question of whether there is a single, absolute physiological scale of well-being or utility, and whether the organism consciously or unconsciously acts out of self-interest to maximize this quantity. First, both behavioral observation and brain studies indicate that organisms seem to be on a *hedonic treadmill*, quickly habituating to homeostasis, and experiencing pleasure from gains and pain from losses *relative* to the reference point that homeostasis defines; see Sanfay *et al* (2003). People quickly grow to accept the city in which they are located, their job, their mate, and their health status. They may recognize and complain about unfavorable absolute states, but their levels of satisfaction by various

²See Becerra *et al* (1999), Berridge (2003), Bhatt and Camerer (2005), Bozarth (1994), Camerer (2005), Damasio (2005), Dickhaut *et al* (2005), Fehr *et al* (2005), Fehr (2004), Glimcher *et al* (2005), Laibson (2005), McCabe *et al* (2001), McClure (2004), Rosfeld *et al* (2005), Rustichini *et al* (2003), Sanfay *et al* (2003), Singer and Fehr (2005).

measures are not nearly as differentiated as they would have to be if their sensation of well-being was experienced on an absolute scale.

Second, the picture that emerges from brain studies is that the dopamine reward pathways in the limbic region play a central role in experiencing pleasure, and also mitigate, with a lag, the sensation of pain; see *Becerra et al*(1999), *McClure et al*(2004). Adaptation to homeostasis and differentiation between the pleasure and pain circuits coincide with the powerful endowment and loss aversion effects, and sensitivity to framing and context, found in behavioral studies, and suggest that these phenomena are tied fundamentally to brain structure. This is good news and bad news for utilitarians: the limbic system reward pathways record pleasure and pain on what seems to be close to a utilitarian scale, but brain circuitry processes experience in ways that are not necessarily consistent with relentless maximization of hedonic sensation.

One of the interesting bits of contemporary biology has been the establishment for a variety of species of simple direct links from particular genes to the production of and receptors for specific neurotransmitters, and from this to specific social behavior. One peptide, oxytocin, is particularly involved in bonding and trust between animals, most notably between parents and their offspring. This is relevant to economics because, in the words of Kenneth Arrow, "every commercial transaction involves an element of trust". In a study that strikes at the heart of consumer sovereignty, *Ernst Fehr et al* (2005) and *Kosfield et al*(2005) administer oxytocin or a placebo to subjects, and then ask them to play the trust game. In this game, an investor is given 100 MU. She has the option of placing Y MU with an anonymous trustee, who through the experimenter receives triple this amount. The trustee then volunteers to send Z MU back to the investor. The trustee's subgame is a dictator game in which norms of fairness and reputation matter, but the rational response in a single-shot anonymous game is to return nothing. By backward induction, the investor should send nothing. In fact, both the investment and the return are usually positive, with the level of investment higher in subjects who are administered the "trust" peptide oxytocin. However, oxytocin has no effect on play of the dictator

subgame, where trust does not matter. The conclusion is that economic perceptions and decisions are sensitive to brain chemistry, and susceptible to chemical manipulation.

Neuroeconomics is a new subject, and the future will determine its potential and limits for understanding economic choice behavior. However, it already seems to confirm and explain that brain structure and chemistry are behind some systematic anomalies in economic behavior, particularly failures to consistently form perceptions and pursue self-interest when confronted with choices involving remote, uncertain, or ambiguous outcomes, failures to recall or anticipate in full color the sensations that outcomes produce, and the quick adaptation to circumstance, the hedonic treadmill.

4. Personal Risk.

"What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention, and a need to allocate that attention efficiently among the overabundance of information sources that might consume it."
Herb Simon, 1971

"A large literature from behavioral economics and psychology finds that people often make inconsistent choices, fail to learn from experience, exhibit reluctance to trade, base their own satisfaction on how their situation compares with others', and in other ways depart from the standard model of the rational economic agent. If people display bounded rationality when it comes to maximizing utility, then their choices do not necessarily reflect their "true" preferences, and an exclusive reliance on choices to infer what people desire loses some of its appeal."
Danny Kahneman and Alan Krueger, 2005

The biological evidence that the human brain is complex and layered, more an imperfect meeting of minds than an optimizing computer, follows and supports behavioral evidence from cognitive psychology and experimental economics showing that humans are, well, all too human in the ways they retrieve and evaluate information, and process decisions.³ In overview, these studies suggest that *homo economicus*, sovereign in tastes, steely-eyed and point-on in perception of risk, and relentless in maximization of happiness,

³Edited volumes that survey this subject include Kahneman, Diener, and Schwartz (1999), Kahneman and Tversky (2000), Gilovich, Griffin, and Kahneman (2002), Kagel and Roth (1995), Lowenstein, Read, and Baumeister (2003), Plott (2006). See also Bellemare *et al* (2005), Bosman (2005), Camerer (1999), Camerer and Thaler (1995), Green *et al* (1998), Ho *et al* (2005), Hurd *et al* (1998), Johansson-Stenman and Svedsater (2003).

is an rare species. While consumer behavior in familiar market settings may have these characteristics, when we approach the consumer from a different angle, asking direct and unusual questions about beliefs or values, or offering novel products and services, we find alarming variations from the story of consistent advancement of self-interest. All these apparently normal consumers are revealed to be shells filled with heuristics that have been shaped by evolutionary selection and experience. These heuristics often work. For example, two of my rules which seem successful are "Never buy a Rolex from a street vender" and "Never accept an e-mail offer to transfer millions of dollars to my bank account." However, throw the consumer a curve ball, in the form of a question that fails to fit a standard heuristic for market response, and the essential "irrationality" of the organism is revealed. For most economists, this is the plot line for "Stepford Consumers", a real horror movie. However, even if this bleak portrayal is true, it does not mean that policy conclusions based on consumer rationality are wrong, only that the consumer may need to be coaxed and wheedled into responding to market choices with sufficient diligence to approximate rational promotion of self-interest.

Most of the evidence on consumer decision-making comes from laboratory experiments. Economists reviewing the experimental evidence sometimes comment that markets punish inconsistencies, and consumers learn to avoid them. They then conclude that while these flaws may appear in experiments, they are not important for *economic* behavior. This may be true in repeated, familiar market settings where the conduct and rewards of others provide good examples. However, some consumers are slow learners, and many markets are inconsistent teachers, providing more irritation than illumination, giving random awards and punishments that consumers cannot always translate into accurate road maps for successful behavior. Even if consumers do learn from experience, remember P.T. Barnum's comment that "there is a fool born every minute", additional mugs for the market game. Importantly, the sting of market punishment breeds agoraphobia. Just as children humiliated in the classroom may be turned off rather than educated, consumers humiliated in the market place may develop an aversion to markets, where opportunities for choice may be interpreted as opportunities for mistakes, embarrassment, and regret.

4.1. Memory and Perceptions. There are now extensive experiments and insights from cognitive psychology showing that memory is imperfect and perceptions are often biased and statistically flawed; for detailed surveys, see Rabin (1996), McFadden (1999). Consider first factual and affective memory. Our memories guide our perceptions of alternatives and our preferences, and imperfections in remembering facts and sensations can distort our perspective, leading to inconsistent behavior and disappointment. Table 1 summarizes some of these effects; I will comment on how they can lead to sub-optimal market outcomes.

What we store and retrieve from memory is affected by mood and emotion. Laura Carstensen (Charles *et al*, 2002; Gross *et al*, 1997) finds that advertisements are remembered better, and influence choice more, when the affective content of the ad matches the mood of the consumer. George Lowenstein (1996) finds that emotional sensations are more easily remembered than non-emotional ones, but emotions themselves are difficult to retrieve from memory -- we remember experiencing episodes of pleasure or pain, and these memories can powerfully condition our behavior, "once burned, twice shy", but we fortunately cannot relive the experiences in their original intensity.

Effect	Description
Affective attenuation	Affective memories are recalled/anticipated with diminished intensity
Availability	Memory reconstruction is tilted toward the most available and salient information
Primacy/Recency	Initial and recent experiences are the most available
Reconstructed Memory	Imperfect memories rebuilt using contemporary cues and context, historical exemplars, customary search protocols
Selective Memory	Coincidences are more available than non-coincidences
Subjective time	Compression and attenuation of history, duration neglect

Finding and retrieving information from memory is a complex cognitive task. The answer may be on the tip of your tongue, but sometimes the tip of your tongue is hard to find. We use contemporary cues to guide memory search, and to fill in and bluff when memory fails. Consequently, what we remember is influenced substantially by current context and mood, and these are vulnerable to manipulation in the presentation of choice alternatives.

Selective memory is the phenomenon in which we remember what draws our attention. Coincidences stick in our minds, non-coincidences are forgotten. This influences probability judgments. A good example is the belief in the "hot hand" in athletics, the idea that players can get in the groove for some period of time and play consistently above their game. Objectively, the hot hand phenomenon does not exist -- the observed distribution of runs of success is consistent with independent Bernoulli trials, not with heterogeneous spurts and slumps. The explanation is that long runs are coincidences that are selectively remembered. One of the implications of selective memory for market behavior is that people build up elaborate and complex beliefs about causal relationships between events, taking natural events personally, and persuading themselves that they are systematically lucky or unlucky in handling market risk.

Another important memory effect is subjective time. You all know the canard "Time flies when you are having fun." We have trouble keeping time scales straight in our memories. We telescope time, so past events seem more recent than they actually were. We are unsuccessful in integrating sensation over time. In a phenomenon studied by Danny Kahneman, Alan Krueger, and others (Kahneman and Krueger, 2005; Redelmeier and Kahneman, 1994), episodes of pleasure or pain are remembered selectively in terms of peak and most recent sensation. This can lead consumers to choices that "remember" better than they "experience". There is a relationship between subjective time and brain structure -- current sensation is recorded in the limbic system and its reward pathways, memory of past and anticipation of future sensations is processed in the cerebrum, more analytic and less colorful. David Laibson and colleagues have studied this as the

physiological explanation for hyperbolic discounting (Fehr, 2001; Laibson, 2005; Laibson *et al*, 2005). A final comment is that subjective time is not a new element in explaining consumers' sensations and behavior. Edgeworth (1881) elaborated his description of his fancied hedonimeter by describing how the apparatus would record on a moving drum, "the delicate index now flickering with the flutter of the passions, now steadied by intellectual activity, low sunk whole hours ..." He then goes on to propose, following Jevons (1871), that the same objective time may correspond to different *rates* of thought and feeling in different periods, so that the utility of an experience will be the *subjective* time integral of the sensations involved. Edgeworth would be totally comfortable with the new findings that memory of sensation, and its influence on further choices, is controlled by subjective time.

Perceptions and beliefs are influenced by the way we process information; see Table 2. Memory plays a role; e.g., selective memory is implicated in regression and representativeness effects. We overemphasize recent, available experience in forming beliefs, and depend heavily on readily available cues to construct our perceptions when we need them to make choices.

Effect	Description
Anchoring	Judgments are influenced by quantitative cues contained in the decision task
Context/Framing	History and framing of the decision task influence perception and motivation
Endowment/ Reference Point	Status quo is a "safe" known alternative. "The devil you know is better than the devil you don't"
Extension	Representative rates are more available than integrated experience
Prominence/Order	The format or order of decision tasks influences the weight given to different aspects
Prospect	Inconsistent probability calculus, asymmetry in gains and losses
Regression	Attribution of causal structure to fluctuations; failure to anticipate regression to mean

In experiments, consumers are often influenced by the context and framing of perceptual tasks and choices, and anchor their perceptions to cues contained in the choice task. Anchoring affects statements of willingness-to-pay for public goods obtained by direct elicitation when consumers have incompletely articulated tastes for these goods; see Green *et al* (1998). In addition, anchoring distorts responses to factual questions in surveys. Beyond this why should economists be interested? The answer is that anchoring effects appear clearly in market transactions involving complex commodities. For example, houses and automobiles are typically sold by bargaining, starting from an initial listing price or MSRP. Field experiments with real estate agents show that manipulation of initial offers can influence bargaining outcomes. A study by Simonson & Tversky (1992) finds that when products are positioned so that one appears to be a bargain, a form of anchoring, then consumers will flock to the apparent bargain alternative. When I told a friend who owns a Boston seafood restaurant that he could use this result to reposition his wine list and increase his profits, his response was “tell me something I didn’t learn in hotel school.”

Anchoring is one example of how consumers may be influenced by context and framing that should be irrelevant to choice. A second important example is the endowment effect, also called a reference point or status quo effect, in which consumers show a reluctance to trade away from any position in which they are established. The endowment effect appears in stated preference studies, where willingness-to-pay for an increased amount of a commodity is typically far less than willingness-to-accept a reduced amount of the commodity. Some gap is expected, due to diminishing marginal utility, but experiments show gaps far too large to be explained by classical income and substitution effects. For example, a study by McFadden, Goett, and Woo (1988) of stated willingness to pay for changes in reliability of electricity supply found that mean stated WTP for a change between two levels, neither of them the status quo, was valued consistently by consumers independently of their status quo, but in comparisons between the status quo and any

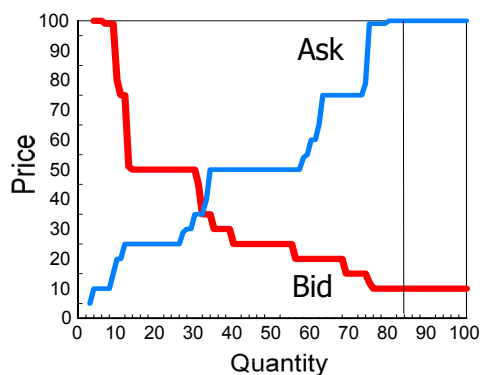
alternative, the status quo is given extra value, independent of its level. It appears that the hedonic treadmill is at work, with people habituating to their current state, and viewing changes with distaste.

A dramatic illustration of the endowment effect is the now-classical cup experiment of Jack Knetsch (1989), in which a random assignment of coffee cups in a class, followed by an opportunity to trade, produced a large gap between WTP and WTA, with far less trading than should be needed to move from a random allocation to a Pareto optimal one; see also Kahneman, Knetsch, Thaler (1990). I repeated this experiment in an introductory microeconomics course at Berkeley, using pencils embossed with the course name. About half of the 345 students, 172, were randomly assigned a pencil. Then, a Vickery sealed-bid uniform price double auction was held to reallocate the pencils; see Yoon (2005). In this auction, each bidder has an incentive to report her true value, independently of the strategies of others. The income effect of being endowed with a pencil is negligible, so that with random assignment the distributions of money marginal utilities of a pencil should be the same for buyers and sellers. Then if consumers are neoclassically rational, there should be no endowment effect.

Consider a market with N participants with values $v_1 \geq \dots \geq v_N$, and K randomly allocated pencils. In the incentive-compatible Vickery double auction, successful buyers pay v_{K+1} , and successful sellers receive v_K , with the market operator covering the difference. The number of pencils J initially allocated to the K highest value participants has a binomial distribution, $b(K, K/N)$. The volume in the efficient auction is then $K - J$, which has mean $K(N - K)/N$ and variance $K^2(N - K)/N^2$.

In the experiment, the expected volume is 86.25, with a standard deviation of 6.56. The actual market clearing price was $v_{K+1} = v_K = 35$, and the number of market-clearing transactions was 32. Under the hypothesis of no endowment effect, the probability of 32 or fewer transactions is on the order of 10^{-16} . The

Figure 1. Pencil Experiment Offers



median offer to buy was 10 cents and the median offer to sell was 100 cents. A runs test confirms ($T = 12.5$) that buyers and sellers do not have the same value distribution. Thus, there is a strong, trade-suppressing endowment effect, generated instantaneously by a random allocation of pencils. Either tastes are changing endogenously, with quick habituation to the status quo, or agoraphobia is real -- consumers find trade an edgy experience, instinctively mistrust the market, and resist trading for small gains.

Consumer preferences among risky prospects, lotteries, show a number of behavioral anomalies that appear to be related to the endowment effect. In summary, consumers appear to evaluate lotteries as *changes* from a reference point that may be sensitive to framing, and to exhibit *asymmetric loss aversion* in which losses loom larger than gains, with consumers displaying risk aversion for gains and risk seeking for losses, a *certainty effect* in which there is a pure preference for sure things over lotteries, and a *prospect effect* in which the probabilities of low-probability events are overestimated. One of the consequences of these effects is that consumers will often refuse to take any share of either side of an offered lottery, a result consistent with the observed paucity of real-world wagers. An additional reason that individuals are ambagious about lotteries, and often avoid them, is the superstitious belief that there are hidden causal forces at work, interventions that place the lottery in ambagious relationship to the rest of life.

These is experimental evidence that endowment effects are attenuated when traders are experienced; see Myagkov and Plott (1997), List (2004). Thus, the observed paucity of trades in lotteries may occur primarily for novel events and inexperienced traders. These facts are consistent with a proposition that learning by observing and by doing may be effective in selecting rational market behavior rules in arenas with sufficient repetitiveness to allow these effects to operate.

4.2. Calculation and Processing. The ideal rational consumer has the computational power to value complex commodities and consistently handle risk, discounting, and option calculations, and the logical clarity to work through the consequences of decisions and optimize choices. In practice, both computational and

logical skills are limited. This may be inconsequential for repeated short-lived choices, such as picking out your breakfast cereal or deciding when to change lanes, but these limitations become critical for unfamiliar, not easily reversed choices, such as occupation, job change, house, automobile, children. The deficiencies are most severe when choice involves small, ambiguous risks in the distant future, as in the case of smoking and other addictive activities, a perfect storm in which distortion of perceptions of time, risk, and affect combine with difficult computations of options and contingencies. Table 3 lists some of the effects that impede accurate processing and maximization of preferences.

A first limitation is that we miss many choice opportunities, and are barely conscious of others which we make almost automatically. Driving an automobile is an example. We may ignore opportunities to change lanes or pass, or may decide to do so without conscious thought. Such decisions are usually sensible; we develop habits that usually work well and save scarce attention time. However, they may not be optimal. In particular, lack of attention may lead to procrastination and default choices that are, after the fact, clearly not optimal.

Table 3. Decision Calculation and Processing	
Effect	Description
Awareness	Recognition of choices, subjective definition of choice set
Construal/ Constructive	Cognitive task misconstrued, preferences constructed endogenously
Disjunction	Failure to reason through or accept the logical consequences of choices
Engagement	Limited attention to and engagement in the cognitive task
Innumeracy	Limited capacity to "run the numbers"
Suspicion/ Superstition	Mistrust offers and question motives of others in unfamiliar situations, avoid choices that "tempt fate"

I think it is remarkable in balance how well most people function in markets, even those with little academic aptitude. This may be because we are adapted to trade, and because we are good at copying successful behavior. Nevertheless, processing deficiencies

such as disjunction and innumeracy do confuse choice. Ellen Peters at Decision Research studies the ability of people to understand and logically relate numbers, an essential skill in trading that involves prices or barter terms, or more complex valuations requiring risk assessment or discounting. Even if individuals do not consciously "run the numbers" to determine choices, they still have to form perceptions and make judgments based on numerical information. The behavioral evidence is that innumeracy rates are high, and significantly distort decisions. Peters and her co-authors (Peters *et al*, 2005) find that half the population are unable to read and make sense of numbers in the newspaper. Among those who score badly on a battery that measures basic numerical and logical skills, one finds errors such as altering ratings of risk and choices when probabilities are presented as number of successes out of a hundred, number of failures out of a hundred, or as percent successes. In one telling experiment, subjects are offered a prize if they draw a red jellybean from their choice of bowls. Bowl A contains 9 red and 91 white beans, while bowl B contains 1 red and 9 white beans, so the odds of success are objectively better with bowl B. Nevertheless, subjects who score low in numeracy often choose bowl A because it "gives more chances to win".

One could be hard-nosed about such people, and say that if they have not educated themselves sufficiently to look after their own interests in markets, the consequences are on their shoulders. However, the economically unsuccessful can vote, and they demonstrably have used the vote at various times and places to pick bad governments and bad economic policies. The argument against "sink or swim" is that when designing market mechanisms, it is in society's interest to take a protective interest in this segment of the population, building in information and decision-making aids, and protection from market wolves, that give these people a chance of success, thereby increasing the fairness of these mechanisms and support for them. This argument becomes stronger when one considers the sociality of choice, and observes that there is more than "self" in self-interest.

5. Social Risk.

In risk perception, humans act less as individuals and more as social beings who have internalized social pressures and delegated their decision-making processes to institutions. They manage as well as they do, without knowing the risks they face, by following social rules on what to ignore ...

Mary Douglas and Aaron Wildavsky, 1982

Man is a social animal, identified with family and kin, and with troops, tribes, clubs, ethnicities, and nationalities. This has several consequences for economic choice behavior. First, individuals may look to their social networks for information. Second, they may look to social networks for approval, and use social accountability to limit choice. Social norms can be comforting, limiting options and regrets, but they can also lead to embarrassment, ostracism, and agoraphobia. Third, consumers may out of pure self-interest engage in mutually beneficial reciprocity, simple when the acts are synchronous, involving more complex elements of reputation and trust when they are not. Pursuing comparative advantage, with division of labor and trade, is a form of reciprocity. Fourth, they may engage in genetic altruism, making choices that are in the interest of their progeny rather than themselves as individuals. Fifth, they may exhibit altruistic behavior that does not obviously serve their personal or genetic self-interest, such as incurring costs to sanction greedy behavior.

5.1 Information. One major way sociality works is through transmission of information, learning by imitation rather than learning by doing. People constantly make interpersonal comparisons, judging the desirability of options from the apparent satisfaction and advice of others. While personal experience is the proximate determinant of the utility of familiar objects, and may be extrapolated to similar objects, our primary sources of information on new objects come from others, through observation, advice, and association. McFadden & Train (1996) show that in innovation games with uncertain payoffs, it may pay to wait, and learn by observing rather than learn by doing. Manski (1991) has explored the possibility that individuals faced with dynamic stochastic decision problems that pose immense computational challenges may simply look to others to infer

valuation functions to be used to judge the future payoff of current acts, or to infer satisfactory policies. An objection to such copycat behavior is that it fails to take account of the individual's idiosyncratic tastes, and correcting this quickly gets the individual back into the computational difficulties that imitation was intended to circumvent. But if tastes as well as perceptions are modified socially, the relevance and value of the lessons from others increases.

Economic demographer Hans Peter Kohler (2001) has investigated the effect of word-of-mouth communication from friends on choice of contraceptive. He studies Korean peasant women, who have access to relatively little public information on efficacy, costs, and side effects of new contraceptives. Choices within villages show little diversity, but there is substantial, persistent diversity across villages. This pattern not explained by income, education, or price differences. Word of mouth communication from friends was found to be the important explanation of most women's choices. Lack of inter-village mobility explained multiple equilibria, with persistent inter-village differences. Thus, some apparent taste heterogeneity is due to the boundedly rational practice of imitation in balkanized social networks. The implications of social information networks for economic policy makers is something that is part of the bible of marketing -- product launch and penetration is critical to tipping network opinion and ensuring success. Serious education of network information leaders through demonstration and experience is important not only for promotion of a product, but also for its design. Using staged "town meetings" to sell products is poor marketing, for goods and for economic policies.

In addition to providing information, social networks may discipline the behavior of members through consensus on social norms, accountability for choices, and sanctions for behavior that violates norms.⁴ The individual gains from affiliation with such networks if imitation and conformity save energy, if the "expectation that one will be called upon to justify one's beliefs, feelings, or actions, to others" improves decision-making, and if approval is itself a source of pleasure. We engage in a great deal of automatic or intuitive

⁴See Becker (1976), Bloch *et al* (2005), Hamlin (1991), Poppe (2005).

thinking, or one might say semi-conscious or background thinking, in daily decisions. For example, an experienced driver does not go through a conscious process of deciding to change lanes. Automatic thinking saves energy, and time. The classical idea of herd mentality is that social animals find it easier and more comfortable to adhere to a group, accept group roles, and mimic group behavior than to act independently. Accountability reinforces herd mentality in fixed groups, and promotes safety in numbers. Individual membership may be voluntary, as in the peloton of tightly packed riders in a bicycle race, with riders tightly clustered and constrained in order to save energy in preparation for "breakaways".

5.2. Reciprocity and Altruism. Reciprocity is a simple form of social interaction, present in economic trade and explained by self-interest. Reciprocity is easy to establish when it is synchronous, as in bilateral barter. However, asynchronous reciprocity requires reputation and trust. Norms for fair practice, and sanctions for bad behavior, may evolve in social networks to facilitate asynchronous reciprocity, and individuals may by habit or internalization conform to these norms even in novel situations where the normal cycle of approval and reputation is suspended; see Fehr and Schmidt (1999), Mulder *et al* (2005). Consider the single-shot ultimatum game with anonymous players: Player 1 proposes a division of a prize of 100 units. If Player 2 accepts, the players get the proposed shares; otherwise, they get nothing. It is rational for Player 2 to accept any positive amount, and thus rational for Player 1 to offer the minimum positive amount. However, if the probability of acceptance $a(s)$ by player 2 is less than one when the share s offered by player 1 is low, then player 1's optimal strategy is to maximize $a(s) \cdot (1-s)$. Students in a cross-section of developed countries play similarly. Offers are usually 42 to 50 percent of the prize, and offers less than 20 percent are rejected about half the time. These results are consistent with social norms for fairness in which individuals altruistically incur costs to punish greedy behavior.

Sam Bowles and a team of experimental economists and ethnographers have conducted anonymous ultimatum game experiments in 15 isolated societies whose ways of life provides natural experiments on the influence of cultural norms; see Henrich *et al*

(2001, 2004). The findings overall are that cultures where cooperative activity is important, and particularly where people are exposed to markets, induce offers in the ultimatum game that are more equitable.

Genetic Altruism is the phenomenon of self-sacrifice for the good of your family or kinship group. Genetic altruism appears to explain cooperation in most species, and seems to have a convincing evolutionary basis. It has been a central theme of sociobiologists in the past four decades, but the concept itself is as old as the concept of self-interest, as in a quote from Adam Smith (1853):

"Every man feels [after himself, the pleasures and pains] of the members of his own family. Those who usually live in the same house with him, his parents, his children, his brothers and sisters, are naturally the objects of his warmest affections. They are naturally and ususally the persons upon whose happiness or misery his conduct must have the greatest influence."

Despite its recognized importance, particularly in economic models of the family and of intergenerational transfers, genetic altruism not been systematically studied as a determinant of economic behavior. The operation of genetic selection could be very indirect. Thus, the acquisition of language, the exploitation of comparative advantage, the formation of successful defenses against marauders and disease, and a disposition to "fair play" that reduces interpersonal conflict, may all arise from the selective advantage to group traits that promote sociality. Then altruistic behavior, including pure altruism with gifts to unrelated individuals with no possibility of personal gain, might be explained as an indirect consequence of genetic self-interest, as might the "warm glow" most humans experience when placed in a supportive, cooperative environment, the distaste people have for aggressive, greedy traders, the potlatch pride of being more generous than your neighbors.

Summarizing, physiological, behavioral, and sociological evidence indicate strongly that consumers will often fail to reliably promote their self-interest when choices involve risk, ambiguity, integration of experience, and perceptions of remote and/or unlikely events.

Consumers' failures will loom large, and this may generate agoraphobia. Market-oriented economic policy needs to take into account how consumers' market experiences and outcomes will influence well-being and acceptance of market solutions.

6. Consumers and Medicare Part D

Medicare's Part D drug plan is extraordinarily complex. This government program takes the cake, the candles, the platter and the crumbs.
Kathleen Pender, SF Chronicle

Medicare Part D is not that difficult to understand. There has been a lot of confusing information in the news about Part D Medicare.
OregonHealthInsurance.com

The new Medicare Part D program that began operation on January 1, 2006 provides prescription drug coverage through Medicare-approved plans offered by private insurance companies and HMO's. Consumers in the Medicare population can choose to opt out, or enroll in one of the private plans available in their geographic area. This is a large and complex government program that provides substantial entitlements for the elderly and substantial insurance against catastrophic drug costs. If the entire eligible Medicare population of 41 million enrolled in this program, then at current levels of prescription drug use, the net subsidy from general government revenues is about \$44.8 billion per year; this includes some double counting of Medicaid, veterans, and other programs that currently cover prescription drug costs, and assumes that all employer and union plans meet Medicare requirements and qualify for the subsidy. There is an adverse selection problem. If the approximately 27 percent of the elderly whose annual pharmacy bills are currently below \$842, the breakeven point in 2006, delay enrollment until health conditions warrant, the net cost of the program rises another \$4.2 billion. However, moral hazard is the bigger issue.⁵

⁵See Adams et al (2003), Goldman et al (2004), Hall (2004), Huskamp et al (2004, 2005), Moran et al (2005), Yang et al (2004).

In the Medicare population, people with prescription drug coverage average 1.1 more prescriptions than those without. If the 26 percent of the population who currently pay all their pharmacy bills enroll in Part D, experience this increase in number of prescriptions, and face the current average monthly cost of a new prescription, \$66, then this increases the cost of the program by \$6.8 billion. In these worst cases, the effect of adverse selection and moral hazard together is projected to increase the cost of the program to \$55.8 billion.

The creation of a market in which private companies compete to offer coverage, and consumers have choices of carriers and plans, was an important element in the Part D legislation. For economists, it is an interesting economic policy experiment on whether the benefits of competition can overcome the problems of adverse selection and moral hazard that always lurk in private insurance markets, whether the Center for Medicare and Medicaid Services (CMS) can efficiently manage its principal/agent and underwriting relationship with private insurers, and whether consumers can understand and evaluate plan alternatives in their own self-interest. In 2004, NIH asked research groups working on the economics of aging if they could provide information on the impact of the Part D program. My research group attempted to do this by modifying a survey we were planning to study health perceptions and choices of the elderly. During the week of November 7-15, 2005, just before enrollment for Part D began, we surveyed 4739 persons age 50 and older and gathered information on health conditions and prescription drug use, knowledge and enrollment intentions for Part D, and preferences across different plans. Our initial findings are given in Joachim Winter, Rowilma Balza, Frank Caro, Florian Heiss, Byung-hill Jun, Rosa Matzkin, and Daniel McFadden (2005). I will summarize a few findings here, with particular attention to the question of whether consumers are sufficiently self-reliant to take advantage of the choices offered by the private market structure of this program.

The Part D program is complex because of its interactions with existing employer or union-provided drug coverage and with Medigap insurance, and its provisions for means-tested cost reductions for low-income consumers. There are five main classes of eligible consumers:

1. Standard Medicare, including those with Medigap policies that do not cover drugs

2. Standard Medicare with Medigap policies that cover drugs
3. Employee or Union provided coverage, including drugs
4. Medicare Advantage (HMO or PPO) policies that cover drugs
5. Medicaid beneficiaries

Generally, those in the last three categories receive Part D coverage by default. Those with Standard Medicare will default out of Part D if they do not take action, but have the choice of enrolling in a privately offered plan, or of converting to Medicare Advantage coverage. In virtually all cases, there are Part D plans that are more advantageous than Medigap policy drug coverage. The analysis that follows applies to the people currently on Standard Medicare.

CMS has established a Standard plan under Part D that has an annual premium of \$444, a deductible of \$250, pays 75 percent of prescription drug pharmacy bills above \$250 up to \$2,250, provides no additional benefits until pharmacy bills reach \$5,100, and pays 95 percent of pharmacy bills above that level. CMS requires approved private plans to offer comparable coverage.

Table 4 summarizes consumer out-of-pocket costs under the Standard plan, not including the annual premium, for various pharmacy bills.

Table 4. 2006 Prescription Drug Benefits under Medicare Part D Standard Plan

Annual Pharmacy Bill	Patient Pays	Medicare pays	Percent Paid by Patient	Percent of Patients with Higher Bills
\$0	\$0	\$0	--	85.4%
\$250	\$250	\$0	100%	80.5%
\$500	\$313	\$188	63%	77.4%
\$842	\$398	\$444	47%	73.0%
\$1,000	\$438	\$563	44%	70.7%
\$2,250	\$750	\$1,500	33%	49.4%
\$5,100	\$3,600	\$1,500	70%	16.3%
\$8,000	\$3,745	\$4,255	47%	6.4%
\$12,000	\$3,945	\$8,055	33%	2.1%
\$20,000	\$4,345	\$15,655	22%	0.4%
\$40,000	\$5,345	\$34,655	13%	0.1%

The private insurers who provide drug coverage within the Plan D framework may offer enhancements to the Standard plan, at higher premiums, including coverage for the \$250 deductible and/or for the gap or "doughnut hole" in the Standard plan, which pays no added benefits for pharmacy bills above \$2,250 and below \$5,100. They may offer broader formularies than Medicare requires, variations in the coinsurance or copayment tier structure, and convenience features such as broad pharmacy participation and mail-order services. Approved plans must have formularies that include at least two drugs in each therapeutic category; the fraction of the 100 most frequently prescribed drugs included in currently approved formularies range from 65% to 100%, with a median of about 90%. Enrollees may change plans annually. There are penalties for late enrollment, currently a 1% increase in premiums per month's delay past the initial enrollment period that ends in May 2006. In evaluating alternatives, consumers need to take into account not only their current pharmacy bills, but also the probabilities of developing new health conditions that will require treatment, and the distribution of costs of these treatments. As a result, consumers are being asked to make relatively complex plan assessments, generally with relatively incomplete information on future prospects. Because of the late enrollment penalties, there is not only a current financial risk of making a poor decision, but an option pricing problem of determining the value of enrolling to lock in current premium rates. Not surprisingly, some seniors are finding this a difficult choice, and the media has had a field day publicising Part D's complexity. The economic policy question is this: After the dust settles, will most consumers have made good use of the choices offered by the private market, so that a market-oriented design contributes to consumer well-being? Is further intervention on behalf of the vulnerable needed?

Our survey, entitled the "Retirement Perspectives Survey" (RPS-2005), was fielded as a self-administered internet questionnaire on November 7-15, 2005, using a panel of subjects enrolled by Knowledge Networks, a commercial survey firm. This panel was recruited from a random sample of the underlying population, and all panel members were provided with identical hardware (web TVs) through which they respond to periodic surveys. Members are compensated for participation in the Panel. For our study, 5879

members of the panel aged 50 and over were contacted. Of these, 4738 individuals completed the survey. Our present analysis is restricted to those respondents who are in the Medicare-eligible population, for the purposes of our study defined as age 65 and older (N=1996).

The survey lasted about 22 minutes and covered, in addition to questions about Part D, questions about health status and conditions, long-term care choices, prescription drug use and cost, and attitudes toward risk. We also use the 2001 Medicare Current Beneficiary Survey (MCBS) distribution of annual *pharmacy bills*, and an AARP survey giving median prices of commonly prescribed drugs (as of April 2005) for nine health conditions. Table 5 gives the average numbers of prescriptions used by various groups. Notable is the increase in the number of prescriptions for those who have their pharmacy bills paid by others relative to those who pay their own bills.

Table 5. Number of Prescriptions

Age 50-64		2.8
Age 65+	All	4
Age 65+	Pay Own Pharmacy Bills	3.3
Age 65+	Others Pay Pharmacy Bills	4.4

We find that despite the complexity of the Part D program's competing plans, a majority of the Medicare population have at least some knowledge and intend to enroll. However, low-income, less educated elderly with poor health or some cognitive impairment are significantly less informed, and may fail to take advantage of the program. Table 6 gives the fractions of the Medicare population who just before enrollment started said they had little or no knowledge of Part D. Table 7 gives the percentages of the Medicare population who said just before enrollment started that there were unlikely to enroll in a Part D plan. This does not include people who will not enroll directly in Part D because they already have prescription drug coverage that is at least as good as the Medicare Standard Plan. Overall, 17% say they are unlikely to enroll. The percentages are higher

for those in good health, and those poorly informed. The percentage differences are small, but statistically significant.

All	39.5%
High SES	32.5%
Bad Health	49.8%
Low Cognition	46.9%
Low SES, Bad Health, and Low Cognition	54.3%

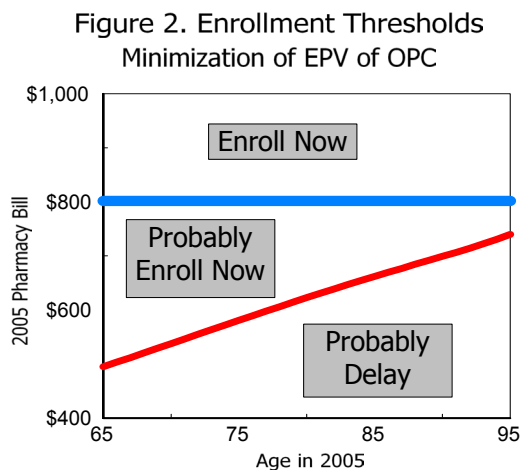
All	17.0%
Good Health	19.0%
Bad Health	11.7%
Well-Informed	14.7%
Poorly-Informed	19.6%

A revealing assessment of the consistency of individual intentions is obtained by comparing enrollment choices with the alternatives that minimize the Expected Present Value (EPV) of Out-of-Pocket Cost (OPC). Underlying the enrollment decision is an *option value* problem: If an eligible person enrolls immediately in Part D, her EPV of OPC in each year from 2006 to the end of her life will be the \$444 annual premium plus her expected pharmacy bill, less the Part D benefit. If, on the other hand, she delays one year, then the EPV of her OPC is her expected pharmacy bill for 2006 plus the EPV of her OPC from 2007 on assuming that she makes the decision to enroll or delay in 2007 and subsequent years to minimize EPV of OPC, and assuming that these future decisions take into account the new information she will obtain on health and prescription cost as she goes along, and the

Medicare premium penalty for late enrollment, which is 7 percent in 2007, and 12 percent per year thereafter. With information on the probabilities of developing new health conditions, and the distributions of drug costs for required therapies, this can be formulated as a dynamic stochastic programming problem, and solved by backward recursion to determine a threshold depending on age such that if the current pharmacy bill is below the threshold, an individual who seeks to minimize EPV of OPC cost will choose to delay. We simplify this computation by approximating a necessary condition for delay, ignoring the influence on expected cost today of the additional information and contingent decisions that will be gained as future health conditions and pharmacy bills are realized. This approximation was found to be reasonably accurate in a study of retirement decisions by Lumsdaine, Stock, and Wise (1994). We implement this calculation using U. S. Life tables, estimates from the Health and Retirement Survey of the annual probability of developing a condition requiring a new prescription drug therapy, and estimates from our survey and the MCBS of the distribution of annual drug costs for a new therapy.⁶

Figure 2 gives the thresholds we obtain using this approximation; these apply to people who do not receive means-tested premium reductions. There are four factors that may modify this calculation for an individual: First, additional information on health that will be revealed in the future, and decisions contingent on this information, gives delay some added option value. Second, risk aversion gives immediate enrollment added insurance value. Trial calculations indicate that the

full option pricing calculation, and risk aversion for a person with moderate coefficient of absolute risk aversion, have effects on the threshold for delay that are relatively small, on



⁶Some plans offer reduced or zero premiums, and may be attractive to the healthy. However, most appear to be available only to those who meet a low income means test or enroll in bundled HMO services.

the order of \$100 or less. Third, individuals may have different personal probabilities for new health conditions and prescription drug requirements than the ones we have used. Fourth, individuals may have different discount rates than the 5 percent discount rate we have employed. For people with 2005 pharmacy bills above \$802, the option of delaying enrollment is “out of the money” – these people can expect to reduce their OPC for prescription drugs in 2006 with Part D coverage, in addition to being insured against risks of high future bills. The difference between the \$802 threshold and the \$842 break-even level for a consumer's current pharmacy bill is the expected value of the consumer's new pharmacy bills in 2006. About 72.5 percent of the Medicare population meet this condition. For those with lower bills, there is an annual pharmacy bill threshold that rises with age from just below \$500 to close to \$750. Individuals who are prepared to self-insure and are currently below this threshold will probably find delay desirable, while those between this threshold and \$802 will probably find immediate enrollment desirable. Approximately 24.4 percent of the Medicare population falls in the region where delay is probably desirable, and 3.1 percent in the region where immediate enrollment is probably but not definitely desirable.

Table 8. Enrollment Intentions			
	Action that Minimizes EPV of OPC		
Intended Choice	Enroll	Delay	Total
Enroll	63.3%	19.4%	82.7%
Delay	10.0%	7.3%	17.3%
Total	73.4%	26.6%	100.0%

Table 8 classifies enrollment intentions against the action that minimizes EPV of OPC. The table shows that 70.6% of the population's choice minimizes EPV of OPC. However, there are 10% who intend to delay even though it is likely in their self-interest to enroll. On the other hand, 19.4% of those intending to enroll would achieve lower EPV of OPC by

delaying. Of course, some of that group may want the insurance against catastrophic costs in the future, and these could be rational decisions if there is very strong aversion to the risk of large, low probability losses. (The expected pharmacy bill in 2006 for a person with no current prescriptions is about \$200, and the probability that this person will in 2006 need drugs with an annual pharmacy bill exceeding the \$5100 level is on the order of 0.06 percent.)

A final part of our survey asked subjects for their preferences among the alternatives of no prescription drug coverage, the Medicare Part D Standard plan, and three hypothetical alternative plans:

- *Guaranteed Benefit Plan* – Medicare pays 52.3 percent of approved prescription drug costs, no matter how high or low these costs are. The annual premium of \$444 is the same as the Standard Plan.
- *Major Cost Protection Plan* – Pays all approved prescription drug costs above \$2,444 per year, but nothing until your cost at the pharmacy reaches this level. The annual premium of \$444 is the same as the Standard Plan.
- *No Copay Plan* – You pay an up-front annual premium of \$1,889 per year, and all approved prescription drug costs are then fully covered, with no copayments.

The alternative plans all have the same actuarial value as the Standard plan for the Medicare population, but differ in the degree to which they provide insurance against major pharmacy costs. The Major Cost and No Copay plans provide almost complete insurance against major costs, with the latter eliminating the deductible and charging an up-front premium for the actuarial value of this replacement. The Guaranteed benefit plan is more favorable than the Major Cost plan at low pharmacy bills, but entails substantial risk at high bills. These hypothetical alternatives vary more from the Standard plan than most products currently being offered, but preferences among them provides some indication of preferences for features of actual plans.

Table 9. Plan Choice		
Alternative	Choice	Min EPV of OPC
Standard	46.9%	45.5%
Guaranteed Benefit	27.1%	3.3%
Major Cost Protection	6.0%	0.0%
No Co-Pay	20.0%	51.2%

Enrollee choice among the alternative plans is not explained well by cost minimization; only 36.3% of enrollees choose the plan than minimizes EPV of OPC. Further, consumers do not seem to place much value on the insurance component of the alternative plans – among enrollees, the guaranteed benefit plan that offers relatively poor insurance against catastrophic drug costs is the minimum cost alternative in only 3.2% of cases, but is preferred by 27.1%, while the no-copay plan that offers complete insurance is preferred by 20.0% and is the minimum cost alternative for 51.2%. We conclude that consumers are likely to have difficulty choosing among plans to fine-tune their prescription drug coverage, and do not seem to be informed about or attuned to the insurance feature of Part D plans.

7. Conclusions. We conclude from our study that 39.5% of the Medicare population have little or no knowledge of the Part D prescription drug program, and that among those of low SES, bad health, and low cognitive ability, the share of those poorly informed rises to 54.3%. Most of the Medicare population, 89.2%, intend to enroll, although this drops to 80.4% among the poorly informed. When one compares preferences with alternatives that minimize the expected present value of out-of-pocket costs, one finds that 10% of the elderly would choose to delay enrollment even though it increases their expected costs, and 19.4% would choose to enroll immediately even though it increases their expected costs. Choice among plans is erratic, and shows little attention to or concern about the insurance features of Part D plans. Medicare and the health service community can

improve outcomes for the elderly by steering those with current monthly pharmacy bills above \$30-\$60 a month toward enrollment, and by providing more information on the insurance value of Part D plans.

We conclude that most of the Medicare population will handle satisfactorily the choices offered by the market for prescription plans, despite the complexity of Part D and consumer discomfort with market choices. There is a significant minority, about 10 percent, who are in danger of opting out of Part D by default, contrary to their own interest. A substantially larger number may fail to pick the optimal plan, or procrastinate past the May 15, 2006 deadline despite their intention to enroll, so there is likely to be considerable churning and grumbling in this market in the future.

It is in the interest of CDC to achieve as universal coverage as possible, to minimize problems of adverse selection, and to avoid the social problem of uncovered individuals with prescription drug needs they cannot afford. Policy changes may be needed to increase enrollment rates. Policies that have proven effective in encouraging early retirement in downsizing firms may work in the prescription drug insurance market. The most effective is "default in" rather than "default out" -- all individuals are assigned a plan unless they either choose a plan or explicitly opt out; see Choi *et al* (2003). The use of early retirement windows has also proven effective, and can be adapted to encourage Part D enrollment -- introduce stiffer late enrollment penalties plus a program to convert non-enrollees, such as a series of "last ever" penalty amnesty windows in the future, particularly for the vulnerable. Generally, recruiting enrollees, particularly those who are beneficial to the system and unconvinced, is much like marketing services such as telephone and internet hookups, and products such as new drugs and new mortgages. There is a lot one can do (e.g., premium holidays, introductory prices, signing bonus to plan providers) to encourage enrollment, and as long as it is not deceptive, it would be hard to argue that it is against the interests of the elderly. One of the most useful things would be to sell hard the benefits of the insurance that part D offers; it is clearly being undervalued now. I believe CMS should increase its marketing of Part D, to find and enroll the eligible who are insufficiently informed to act in their self-interest.

All in all, the market commoner of Medicare Part D is going to be successful, in the sense that it provides choices that consumers want, and achieves the efficiencies it seeks, provided Medicare makes a diligent effort to reach all consumers and provide them with information and assistance in making wise choices. On the other hand, leaving the large block of uninformed consumers to "sink or swim", and relying on their self-interest to achieve satisfactory outcomes is clearly unrealistic. I endorse Thaler and Sunstein's (2003) *libertarian paternalism*. Understanding consumers' limitations, helping consumers to help themselves, and convincing them that the market will serve their interests, need to be components of all market privatization initiatives.

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