How Are Preferences Revealed?

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Abstract

Economists nearly always assume that people’s actions reveal preferences that represent their best interest. In some situations, this assumption makes sense. However, there are many cases in which consumer choices do not reveal a preference that society should interpret as reflecting consumers’ true interests. We describe the kinds of situations in which normative preferences are least likely to be revealed by people’s choices, and we discuss six frameworks that can jointly contribute to the identification of normative preferences.

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Revealed preference theory shows how to construct utility functions from price and choice observations (Samuelson, 1938, 1948; Little, 1949; Houthakker, 1950; Afriat, 1967). Economists nearly always assume that these revealed preferences are normative preferences, representing the economic actor’s true interests. Hence, economists often make policy recommendations based upon preferences inferred from actions.

In some situations, it makes sense to give revealed preferences normative status. When a consumer chooses mint chocolate chip over vanilla ice cream, the consumer reveals a legitimate preference for one flavor over another. The government should respect that preference, and ice cream parlors should cater to it.

However, there are many cases in which consumer choices do not reveal a preference that society should encourage, but rather reflect the combined influence of legitimate preferences and decision-making errors. When a worker invests all of her retirement savings in her employer’s stock, economists should hesitate to infer that she has acted in her best interest. In surveys, workers on average report that an investment in their employer’s stock is less risky than an investment in a diversified mutual fund (John Hancock Financial Services, 2002). When workers put all their financial eggs in one basket, they are probably revealing many things, one of which is confusion about the risk characteristics of employer stock.

Although human behavior is richly determined by normative preferences, analytic errors, myopic impulses, inattention, passivity, and misinformation, economists need not throw up their hands and reject all revealed preferences. This paper describes a compromise in which economists use behavior to identify normative preferences but take care to acknowledge the occasional wedge between revealed preferences and normative preferences.

Section 1 describes the kinds of situations where normative preferences are least likely to be revealed by people’s choices. We illustrate these issues with evidence from savings and investment decisions. We identify five factors that increase the likelihood that revealed preferences will not have normative merit: passive choice, complexity, limited personal experience, third-party marketing, and intertemporal asymmetry (rewards and costs for an action that arrive at different times).

Section 2 discusses six frameworks that can jointly contribute to the identification of normative preferences: structural estimation, active decisions, asymptotic choice, aggregated revealed preferences, reported preferences, and expert opinion/informed preferences. Each
framework relies on consumer behavior to infer some property of normative preferences without equating revealed and normative preferences. Ideally, practical policy analysis would simultaneously use insights from all of these frameworks. Complex normative questions rarely have simple or universal solutions.

1. Red flags

In this section we discuss five factors—passive choice, complexity, limited personal experience, third-party marketing, and intertemporal asymmetry—that sometimes create a wedge between revealed and normative preferences. These factors supplement the usual list of specific behavioral biases, such as the over-weighting of small probabilities and present-biases preferences or quasi-hyperbolic discounting.

1.1 Passive choice

In many situations, economic agents do not actively make choices. Instead, they passively adopt defaults. In theory, acceptance of a default could be a conscious and meaningful decision. In practice, acceptance of a default often reflects other forces, like procrastination or the power of suggestion. Agents who procrastinate will temporarily accept defaults because they plan to opt out of the default at some later date. These subsequent actions can take years to be implemented. Highly suggestible agents may accept defaults because they believe—perhaps falsely—that the person who set the default was making a recommendation. We know that preferences revealed through passive choice are problematic from a normative perspective because they tend to be highly unstable. That many defaults are overwhelmingly adopted no matter what the default is and no matter how it was set has been documented in numerous studies.¹

For example, when a 401(k) default is non-participation, 50% to 90% of those eligible for the 401(k) plan stick with this non-participation default during their first six months of employment (even when they are giving up large employer matching contributions). When the 401(k) default is participation, 80% to 95% adopt the default during their first six months of employment (Madrian and Shea 2001; Choi et al., 2002, 2003). Similar effects arise when

healthy people decide whether to become organ donors in the event of a future accident or illness. Switching the default from non-donation to donation drastically changes the fraction of people who are ultimately designated as donors (Johnson and Goldman, 2003).

1.2. Complexity

Complex problems are hard to solve, driving a wedge between revealed preferences and normative preferences. Complexity tends to delay choice, increasing the fraction of consumers who (at least temporarily) adopt default options (O’Donoghue and Rabin, 2004). Complexity also biases choice, since people tend to shy away from complex alternatives (Shafir and Tversky, 1994; Iyengar and Kamenica, 2006). Finally, complexity adds noise to choices, since complex options will not be as transparent and well-understood as simple options. Hence, some consumers will choose a complex option because they misestimated its value (Gabaix, Laibson, and Li, 2006).

1.2.1. Complexity and number of choices

Complexity increases in the number of choices available. There were 8,454 mutual funds registered in the United States as of year-end 2005. Allocating funds across these 8,454 assets is a difficult task. Iyengar and Kamenica (2006) show that this kind of complexity affects investors’ asset allocation choices. Investors in 401(k) plans with dozens of mutual funds tend to throw up their hands and opt for a simpler choice: a bond fund or a money market fund. Iyengar and Kamenica document similar effects in controlled laboratory experiments.

A superabundance of options also delays 401(k) enrollment. The typical opt-in 401(k) plan asks employees to choose among a dozen or more contribution rates and trillions of possible asset allocations. Choi et al. (2005) study an intervention where unenrolled employees were allowed to opt into a pre-selected contribution rate and asset allocation. Even though the number of 401(k) choices available did not decrease, this simple intervention psychologically reduced the choice set to a manageable number and increased enrollment.

1.2.2. Complexity and risk

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Risk increases complexity when the number of states that need to be considered increases. The decision to carry an umbrella can be boiled down to the probability of one state: rain. In contrast, the decision to fold in a poker game requires implicitly evaluating millions of potential hands. Because the umbrella decision is simple, it is reasonable to impute someone’s normative aversion to being soaked from his willingness to carry an umbrella. However, it is unreasonable to infer someone’s normative attitudes toward risk from her choices in a poker game. In a typical poker game, the decision to fold may be as likely to reflect a logical error as it is to reflect a normative preference.

1.2.3. Complexity and long horizons

Choices with distant consequences are complex. Simulating what will happen later this month is much easier than simulating events on a summer afternoon four decades from now. The challenge of simulating the distant future is closely related to the challenge of simulating any stochastic event. Looking ahead forty years, one needs to consider numerous divergent paths: sickness, health, divorce, bankruptcy, bequests, etc.

Decisions with consequences in the distant future reflect both normative preferences and forecasting errors. Some of those forecasting errors will be predictable. For example, recently released estimates from the Centers for Medicare and Medicaid Services project a 7.2% annual increase in health care spending for the years 2005-2015, outstripping both the annual rates of GDP growth and overall inflation (Borger et al. 2006). It is likely that many workers are not fully aware of these forecasts. The inferences that economists draw about these workers’ intertemporal preferences depend critically on whether these workers are aware of the health costs that they will eventually need to bear. A low savings rate could reflect either a high discount rate and a rational forecast of future health costs or a low discount rate and an under-estimate of those health costs.

1.3. Limited personal experience

Limited personal experience pulls revealed preferences away from normative preferences. Human learning is often generated by feedback. A child learns that hot food burns the roof of his mouth through experience rather than parental lectures. Likewise, credit card account holders learn to pay their bills on time by first paying late fees (Agarwal et al., 2006).
Consumers with little or no feedback are not likely to learn what is in their best interest. What personal experiences could teach a middle-aged worker whether she is saving the right amount for retirement? In principle, she could learn by observing others, particularly people in other generations. However, every generation faces different financial circumstances. Moreover, people are generally far more responsive to their own experiences than the experiences of others. For example, after the bankruptcies and 401(k) debacles at Enron, Global Crossing, and Kmart, US workers at other firms did not reduce their investments in employer stock (Choi et al., 2005).

1.4. Third party marketing

Some behavior is influenced by the marketing campaigns of other interested parties. For example, Tom Sawyer tricked his friends into believing that they would like to paint his family’s fence. Tom was so successful that he was able to induce them to pay him for the privilege. This extreme example illustrates the point that our behavior is malleable and good marketing can severely distort our choices. In the non-fiction world, there are similarly bizarre cases. For example, S&P 500 index funds charge fees that vary by a factor of 28 (Hortaçsu and Syverson, 2004). Moreover, this range of fees cannot be explained by variation in bundled non-portfolio services (Choi et al., 2006). Instead, the willingness to pay high fees is partially a reflection of effective marketing and branding.

Economists may or may not wish to assign normative merit to such revealed preferences, but we should be careful not to glibly take them at face value. When money management firms induce their clients to invest in dominated assets and when employers persuade their rank and file workers to hold employer stock, economists should wonder whether these revealed preferences have normative legitimacy or whether these preferences reflect Tom Sawyer effects (Ariely et al., 2003).

1.5. Intertemporal asymmetry

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2. Inferring normative preferences

The previous section discussed situations in which revealed preferences deviate from normative preferences. For policy purposes, economists would like to be able to measure normative preferences when such deviations occur. In the current section, we summarize six methods for doing so. None of these methods is perfect, and all of them should be viewed as complementary ways of measuring normative preferences. As we discuss each method, we will review its strengths and weaknesses.

2.1. Structural estimation

For an economist trained in modern empirical methods, a natural way to measure normative preferences is to estimate them with a structural model. Such a model would have two components:

(1) A (positive) behavioral model with a parameter vector $\theta$

(2) A set of normative axioms that map the parameters $\theta$ into normative preferences

The behavioral model would incorporate all of the economic and psychological motives that shape behavior, including the mechanisms that generate mistakes (e.g. non-Bayesian inference) and the preferences that are not normatively legitimate (e.g. present bias$^3$).

To implement this analysis, experimental data or field data would be used to estimate the behavioral model (1) and the associated parameter vector $\theta$. These parameters would then be mapped into normative preferences using the axioms in (2).

As an example, suppose consumers’ static revealed preferences are normatively legitimate but their dynamic preferences are not, as in the case where they suffer from present bias. Such an argument would be supported by the normative axioms of Kahneman et al. (1997), which imply that the normative welfare function should have no intertemporal discounting except for mortality effects. On the other hand, the normative axioms in Kahneman et al. respect people’s static preferences over risky alternatives. In this example, $\theta$ would contain both static risk aversion parameters and dynamic discounting parameters. Both types of parameters would be simultaneously estimated from available data, but only the static risk preferences would be elevated to normative status.

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This structural estimation framework has the strength that it forces the researcher to make clear assumptions about behavioral biases and enables the researcher to simultaneously identify both normative preferences and the underlying behavioral model. On the other hand, the structural model has the weakness that it is costly to implement—like most structural models—and it may not be robust to model specification errors.

2.2. Active decisions

In some cases, revealed preferences and normative preferences deviate because people stay at a default that they report is not in their best interest. For example, about half of non-participants report that they are planning to opt into their 401(k) plan in the next two months, but almost none of them follow through (Choi et al., 2002).

For such workers, their revealed preference is that saving is not optimal; they do not join the 401(k) plan. However, their stated preference contradicts their revealed preference. For such conflicted households, it is not clear what their normative preferences actually are. Since their self-reports deviate from their revealed preferences, economists should be hesitant to accept their revealed preferences at face value.

In situations like this, it may be helpful to examine how behavior varies with the type of default that is used. Two 401(k) defaults are common: non-enrollment and automatic enrollment. As discussed above, the nature of the default makes an enormous difference. The non-enrollment default produces enrollment rates of under 50% at six months of tenure. The automatic enrollment default produces enrollment rates of over 80% at six months of tenure (Madrian and Shea, 2001; Choi et al., 2002, 2003).

These defaults may bias behavior, both because consumers tend to procrastinate and because consumers tend to follow the implicit advice that a default represents. A less biased mechanism would be default-free. For example, an active decision mechanism forces newly hired workers to explicitly state their own preferences (Choi et al., 2005). In the 401(k) context, all workers must affirmatively state whether they do or do not want to be in the 401(k) plan by a deadline. Such active decision regimes generate enrollment rates of about 70%, far from the enrollment rates that are observed under either of the biased default regimes.
2.3. Asymptotic choice

In most stationary economic environments, short-run choices are likely to be further from normative optimality than long-run choices. For example, in firms with 401(k) plans that use a non-enrollment default, procrastination may delay enrollment, thereby biasing down the short-run savings rate. Different types of learning—including peer modeling, financial planning seminars, and market feedback—may also advantage long-run choices relative to short-run choices.

Hence, it is likely that the savings behavior of experienced workers is normatively superior to the behavior of inexperienced workers. One should therefore give more weight to the investment behavior of high-tenure workers when attempting to infer normative preferences (Choi et al., 2003).

2.4. Aggregated revealed preferences

When homogeneous individuals make noisy, error-prone decisions, their individual decisions will not reflect normative preferences, but their aggregate behavior will. Hence, normative preferences can sometimes be inferred from the central tendencies of aggregate distributions of behavior.

However, aggregate analysis poses problems when the observed heterogeneity in revealed preferences is due both to noisy errors and to meaningful heterogeneity in normative preferences. In this case, normative preferences can only be imputed if the researcher specifies a model of heterogeneous preferences and decision-making errors.

Furthermore, if decision errors do not have a zero mean, inferences from a population’s central moments can lead to biased conclusions. The common phenomenon of employer stock holding in 401(k) plans is likely to be a manifestation of a non-zero mean error.

2.5. Reported preferences

In many cases, decision-makers report that they know what they should do but nevertheless fail to implement that action. For example, most smokers report that they want to quit, but they fail to successfully carry out this plan (at least on the first three attempts).

Historically, economists have rejected all self-reports on the grounds that behavior has real consequences and self-reports are (usually) only cheap talk. We agree that self-reports can’t
be taken at face value, but we also believe that they should not be ignored completely. In our view, successful models of human decision-making should be able to explain both behavior and self-reports. Like behavior, self-reports can be measured and modeled. Like behavior, self-reports can be used to predict things that economists unambiguously care about (like future behavior).

We recognize that self-reports are often motivated by signaling, but behavior can also be driven by signaling motives. Self-reports reveal at least something about an agent’s goals and values. Normative economics should allow self-reports to have some standing. It would be strange to try to infer someone’s normative preferences without at least considering their own views on the question.

Finally, self-reports can be used to assess a consumer’s confidence that his behavioral choices are optimal (Choi et al., 2006). We find that consumers who choose low-fee mutual funds tend to be more confident about their choices than consumers who choose high-fee mutual funds. Hence, self-reports may provide a natural tool for undoing the tautology of revealed preferences. In this view, we are more likely to interpret revealed preferences as normative preferences when consumers report that they are confident in their choices.

2.6. Expert opinion and informed preferences

Expert opinions come in two forms. First, external observers may offer expert advice (e.g. academics, consultants, financial planners, etc.). Second, decision-makers may themselves gain more expertise when they receive training and education. When trained/educated decision-makers make a choice, we call this an “informed preference.”

In our view, both sources of expert opinion—external experts and practicing experts—should play an important role in the identification of normative preferences. This is particularly true when exogenous education or training can be shown to systematically change people’s behavior. Naturally, there are limits to such arguments, especially when “education” is little more than marketing or brainwashing. However, at least some education is not overwhelmed by these problems. When economists measure normative preferences, we should give disproportionate weight to the actors who have some reason to know what they are doing.
3. Conclusion

Once economists acknowledge a gap between revealed preferences and normative preferences, it is natural to extend our models so that we can clearly distinguish between them. We have reviewed five factors that tend to increase the gap between revealed and normative preferences: passive choice, complexity, limited personal experience, third party marketing, and intertemporal asymmetry.

We have also discussed six ways of measuring normative preferences when they deviate from revealed preferences. Structural estimation specifies a positive model with a precise set of economic and psychological motives (include non-Bayesian thinking and other decision-making errors). This model is then estimated using data, and the resulting positive preferences are mapped into normative preferences using normative axioms.

Active decisions eliminate some biases generated by default regimes. Under an active decision regime, individuals are required to explicitly state their preference without being influenced by a background default. In some circumstances, this preference elicitation will be more reliable (and more socially efficient) than allowing consumers to express their preferences by opting into or out of a default.

In most stationary economic environments, initial choices are likely to be further from normative optimality than choices made after many periods of experience. One should therefore give more weight to asymptotic choices when attempting to infer normative preferences.

When homogeneous individuals make noisy, error-prone decisions, their individual decisions do not reflect normative preferences, but their aggregate behavior can. Hence, normative preferences can sometimes be inferred from the central tendencies of aggregated preferences.

Self-reported preferences reveal something about an agent’s goals and values. Normative economics should allow self-reports to have some standing. This is particularly true when self-reports can be used to distinguish confident consumer decisions from decisions that were made in a state of confusion.

Expert opinions come in two forms. External observers may offer expert advice, and decision-makers may themselves gain more expertise when they receive training or education. When trained/educated decision-makers make a choice, we call this an informed preference.
When economists measure normative preferences, we should give disproportionate weight to the actors who have the best claims to knowing what they are doing.
References


