E C O N O M I C S B U L L E T I N

Capturing moral economic context

Luiz Freitas
Rochester Institute of Technology

Jeffrey Wagner
Rochester Institute of Technology

Abstract

Multiple economic experiments suggest that the moral context of consumption and/or production influences willingness-to-pay and willingness-to-accept. Precisely how this influence should be modeled from a theoretical perspective, however, remains understudied. The prevailing view is that moral context can be captured using an extended utility approach in which "morality" enters the utility function as any other attribute of value. However, in our view the literature does not yet suggest practical modeling strategies that yield testable hypotheses. We show herein that the state-dependent preference approach quite naturally enables modeling of the moral concerns registered in experimental settings.

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1. Introduction

A key area in which scholars tend to disagree regards the appropriate treatment of moral dimensions in an agent's decision-making. Since this disagreement affects every policy recommendation and outcome, a significant research literature has tried to bring the economic concept of morality into clearer focus. Economists have traditionally argued that all relevant effects of morality are adequately—and fairly automatically—captured by an individual's fixed utility function or preference relation. There are two interrelated strands of economic literature that motivate this assertion. First, as proposed by Adam Smith in his *Theory of Moral Sentiments* (1759), economists define individual morality in terms of the actions and outcomes that would be approved by the individual if he or she could step back from them and take the view of an "impartial spectator". The concept Smith had in mind has, in its essence, also been enunciated in the economics literature and other literatures as the Golden Rule, Kant's Categorical Imperative, and Rawls's Veil of Ignorance. Multiple economists in the modern era are engaged in the formalization of this basic concept and in the design of policy instruments that might support individually and socially efficient outcomes in the presence of moral concerns. See, for instance, Laffont (1975), Bilodeau and Gravel (2004), Blackorby *et al.* (2000), Karni (1998), and Karni and Safra (2002a, 2002b).

A second strand of economic literature argues that concerns for morality can and must be accounted for in the utility function or preference relation in a manner that requires individuals to face opportunity costs in choices that may compromise or support their moral integrity. This aspect is presented most forcefully by Kaplow and Shavell (2001, 2002, 2003), but is also clearly present in some of the works cited above as well as in the works of Frey *et al.* (1996), Frey (1997), Isaac (1997), Hart and Latacz-Lohmann (2001), Frey *et al.* (2004) and Kotchen (2005), among others. This literature essentially proposes an extended utility approach through which concepts that some scholars consider deontological in nature may nevertheless be imbedded within the traditional welfarist economic paradigm.

As advanced and as insightful as the above literature is, we do not find that it is quite able to suggest a relatively practical means of capturing moral economic context detected in multiple economic experiments. For instance, Boyce *et al.* (1992) stopped short of suggesting how the moral context they uncover in their experiment regarding Norfolk pines could be modeled as a generalized extension of their work, and we are not aware of research that proposes such an extension. And we agree with Bulte *et al.* (2005, 330, 338) when they write: "Standard applications of utility theory assume that utility depends solely on outcomes and not on causes...[However], Now that we find that cause matters, it is of course important to rethink the formal model that underlies the CVM (Contingent Valuation Model)." We maintain that the multiple "causes" of the agents' concern are multiple moral contexts that we address herein.

The purpose of this paper is to elucidate a concrete extension of the standard utility representation of consumer choice that is both consistent with the two major strands of economic literature regarding morality and that will enable us to motivate in a theoretical manner the important experimental results of Boyce *et al.* (1992), Bulte *et al.* (2005) and others. The extension regards taking a state-dependent preference approach to choices in which moral context matters. This approach suggests itself because experiments indicate that perceived changes in the moral context of consumption serve to

"change" the agent's preferences for the good per se such that the agent's moral sentiments modulate the marginal rate of substitution between goods and services. Moral sentiment is not purchased directly but only through the consumption of bundles of goods and services that are available in multiple moral contexts. This conceptualization of moral choice leads us to posit that agents possess fixed "collections of indifference curve sets," one of which is drawn upon per moral context faced.

Of course, this is analogous to situations that arise in other microeconomic contexts in which agents face multiple states and a movement along a stationary indifference curve must be distinguished theoretically from a twist in the level set of curves. For instance, in the health economics literature, Jones-Lee (1974), Weinstein *et al.* (1980), Viscusi and Evans (1990), and Evans and Viscusi (1991) analyze consumer choice from the perspective that one utility function prevails in the good state ("well" or "alive") and another function prevails in the bad state ("ill" or "dead"). In an industrial organization context, Matthews and Postlewaite (1985) analyze consumer desire for mandatory product safety testing rules using a model in which each consumer's marginal rate of substitution over the (potentially) tested good and a numeraire good increases in the state of the (potentially) tested good's quality. And in an environmental economics context, Smith and Desvousges (1987, 1988) bring a state-dependent preference approach to bear upon the problem of measuring the benefits of morbidity and mortality risk reductions. In all of these models, the agent's preferences for the good per se are unchanged; however, the agent's preferences for the good *within alternative states* (contexts) do change.

Our paper proceeds as follows. In Section 2, we describe in greater detail aspects of the morality-and-economics literature described above that motivate our approach. We then show how a state-dependent preference approach enables natural expression of the moral context evident in the experimental findings of Boyce *et al.* (1992) and Bulte *et al.* (2005). In these instances, there is no uncertainty over which moral context the agent faces, and the state-dependent preference model straightforwardly yields two willingness-to-pay functions corresponding to the two possible moral contexts. We conclude in Section 3, and propose a particular area for future research that considers the effects of uncertainty over moral states.

2. Modeling Moral Context Under Certainty

The significant literature we referenced in Section 1, taken as a whole, suggests that capturing moral economic context in consumer choice problems requires a suitable extension of the individual's stable, well-defined utility function or preference relation. When confronted with a consumption choice that is perceived to threaten moral integrity, the moral individual must be willing to react by giving up an increment of numeraire good or money. The approach we set forth is motivated by two specific experimental results in the environmental economics literature: the consumption of Norfolk pines in different moral contexts ("kill and no-kill") discussed in Boyce *et al.* (1992), and the extent to which *cause* (human or nature) of environmental change matters, as discussed by Bulte *et al*. (2005).

The "Norfolk pines" experiment revealed the phenomenon that people gain utility from Norfolk pines per se (when there is no information given or inquired about the disposition of unsold trees) as well as from the treatment of unsold trees. There is a

corresponding willingness to pay for the trees per se, taking one's budget constraint into account. When what may be called the "moral context" changes to include exogenously provided information that unsold trees would be destroyed, the willingness to pay (and accept) was found to have increased.

Bulte *et al.* (2005) conduct a field experiment in which the willingness to pay for seal conservation efforts in the Netherlands was estimated. As they discuss, it is an open question in the literature as to specifically how willingness to pay reports are related to knowledge of whether the environmental problem at hand has a natural or human cause. In their study, they find that the willingness to pay is sensitive to natural versus human causes of damage; in particular, participants in their study were willing to pay significantly more to mitigate human causes of damage, which the authors call "the outrage effect". However, they did not find evidence of the "moral responsibility effect", wherein some scholars such as Walker *et al.* (1999) assert that the willingness to pay (and accept) should rise with the level of personal responsibility an individual feels toward an environmental problem caused by either nature or humans. In the presence of such a moral responsibility effect, the willingness to pay to deal with a nature-caused environmental problem could well be higher than the willingness to pay for human-caused damage; indeed, this is just what Walker *et al.* (1999) found in their experiments.

The above studies, among others, highlight the necessity of specifying a priori the structure of moral context in the individual's economic problem. The morality-and-economics literature suggests that the moral context of consumption and production is but another quality attribute of the good in question which can therefore be considered within the utility function alongside other attributes. However, the literature has not yet taken the step of specifying precisely how moral context can be modeled in a concrete manner that lends itself to empirical testing of its presence and magnitude. The state-dependent preference approach, utilized in several theoretical and empirical microeconomic investigations, provides a natural way forward. We next show that by taking this approach, one can argue that adding or subtracting a moral dimension to the consumption of Norfolk pines amplifies or reduces the intensity of preference for Norfolk pines.

Suppose the representative agent in Boyce *et al.'s* (1992) experiment is presented with the opportunity to consume Norfolk pine trees (T) and a numeraire good (N), and the agent is aware that there are two possible states in which this consumption can take place: unsold trees may be kept alive (state *A*), or unsold trees may be destroyed (state *D*). Thus, *the superior moral context corresponds to state D, for each tree purchased is a tree that will not be destroyed*. If the agent is uncertain which moral context (state) will materialize, then in the simplest specification the agent would possess a subjective probability assessment π_A that state *A* will obtain, and probability assessment $1-\pi_A=\pi_D$ that state *D* will obtain. The state-preference approach leads us to posit that, in general, the representative agent has a state-dependent expected utility function over *S* states of the form:

$$EU(N,T,\pi_s)=\sum_{s=1}^{S}\pi_s U_s(N,T) \tag{1}$$

In our two-state situation under immediate consideration, we have:

$$EU(N,T,\pi_A)=\pi_A U_A(N,T)+(1-\pi_A)U_D(N,T) \tag{2}$$

This framework enables us to disentangle the utility the agent may derive from trees per se from the utility the agent derives from preserving or growing one's moral integrity through modulating the consumption of goods such as trees in alternative moral contexts. We adopt the following standard assumptions:

$$\frac{\partial U_s}{\partial T}, \frac{\partial U_s}{\partial N} > 0, \forall s \in S \tag{3a}$$

$$\frac{\partial^2 U_s}{\partial T^2}, \frac{\partial^2 U_s}{\partial N^2} < 0, \forall s \in S \tag{3b}$$

$$U_A(N,T) < U_D(N,T) \tag{3c}$$

$$\frac{\partial U_A}{\partial T} < \frac{\partial U_D}{\partial T} \tag{3d}$$

$$\frac{\partial U_A}{\partial N} = \frac{\partial U_D}{\partial N} \tag{3e}$$

Given these assumptions, the marginal rate of substitution of *T* for *N decreases* in *s* (i.e., as the moral context for consuming *T improves* from *A* to *D*):[1]

$$\frac{\frac{\partial U_A}{\partial N}}{\frac{\partial U_A}{\partial T}} > \frac{\frac{\partial U_D}{\partial N}}{\frac{\partial U_D}{\partial T}}. \tag{4}$$

With regard to the experimental results of Boyce *et al.* (1992) and Bulte *et al.* (2005), the representative agent knows ex ante that the probability π_A is either zero or one; that is, there is no uncertainty regarding the moral context. If the moral context is known to be that in which the unsold trees will be kept alive ($s = A$), or if the moral context is known to be that in which the unsold trees will be destroyed ($s = D$), then (2) can be written as (5a) or (5b), respectively:

$$U(N,T) = U_A(N,T) \tag{5a}$$

$$U(N,T) = U_D(N,T) \tag{5b}$$

The agent's abstract problem is to choose *N* and *T* to maximize either (5a) or (5b) subject to a standard, linear budget constraint such as $p_N N + p_T T = M$, where *N* and *T* are assumed to be available at constant prices, and *M* denotes the agent's nominal income or endowment. We may obtain particular solutions that illustrate this state-dependent preference approach under certainty by assuming a continuous and differentiable functional form such as Cobb-Douglas.[2] Maximizing (5a) and (5b) in turn, subject to the budget constraint, and jointly solving the first-order conditions yields the optimality condition that Norfolk pines and the numeraire good be consumed such that the marginal rate of substitution in each context equals its respective price ratio. The bundles that are obtained in each moral context are illustrated below in Figure 1. Each indifference curve, including the one through the original consumption bundle, is flatter than before. This being the case, utility in the presence of the higher moral context (state *D*) is no longer

[1] This is a standard aspect of the state-dependent preference approach; see Matthews and Postlewaite (1985, 335, Eq. 6), for instance.

[2] Viscusi and Evans (1990), for instance, utilize a Cobb-Douglas utility parameterization within their state-dependent preference framework.

maximized at the original bundle. The new maximizing bundle is now somewhere to the northwest—a bundle that has fewer units of numeraire good and more units of Norfolk pines.

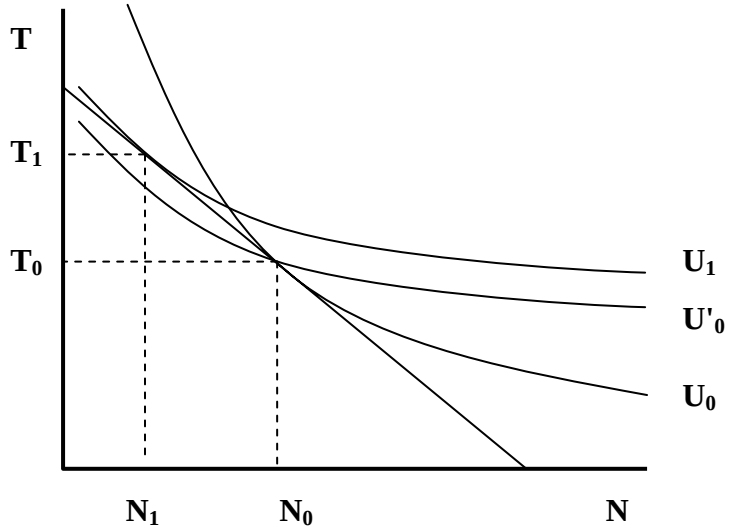

Figure 1

Notice that in relating this change to the demand for Norfolk pines, the enhanced moral context with no change in the price of Norfolk pines yields a new quantity demanded on a new, higher demand curve for Norfolk pines. This is a standard result in the state-dependent preference literature; see, for instance, Matthews and Postlewaite (1985, 335). We illustrate the importance of this general result in the specific experimental results of Boyce *et al.* (1992) in Figure 2 below.

The first point on the (Marshallian, uncompensated) demand graph is $\left(T_0, p_T^0\right)$ and the new point is $\left(T_1, p_T^0\right)$. That is, when the price of trees per se is unchanged but the moral context changes from "alive" to "destroyed", the quantity demanded of trees would rise from T_0 to T_1. Now, what Boyce *et al.* observed was an increase in the willingness to pay. Notice that one may sketch a downward sloping inverse Marshallian demand function through each of these two points, elucidating the shift in demand. With these two functions on the graph, we can deduce that the increase in the willingness to pay for Norfolk pines corresponding to the morally threatening moral context of their consumption is the vertical distance between the functions at each *T*. (The prices of $7.81 and $4.81 are the mean willingnesses to pay, taken from Boyce *et al.* (1992, 1370).)

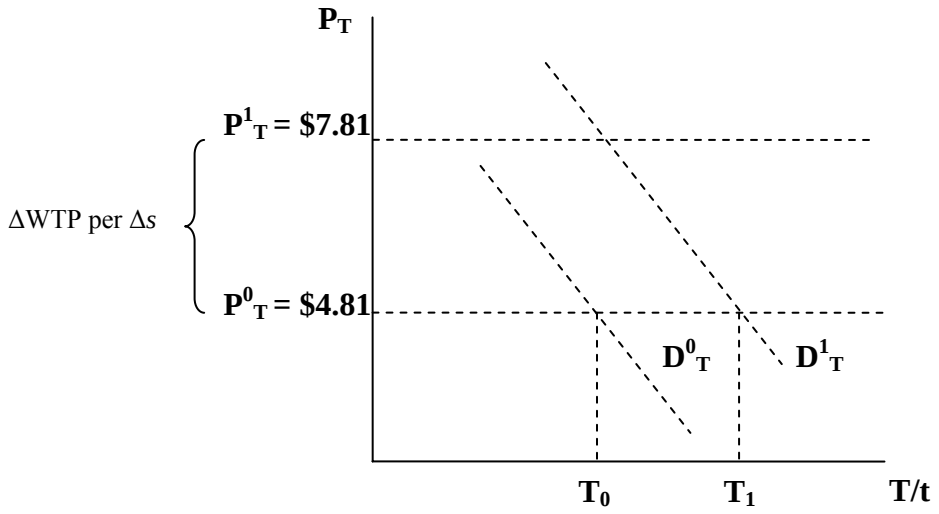

Figure 2

3. Conclusions and Directions for Future Research

The above discussion suggests that our model serves several purposes. Foremost, it is a general model that provides theoretical structure for the testable hypotheses explored by Boyce *et al.* (1992) and Bulte *et al.* (2005). If the moral context changes to one that poses a challenge to the agent's moral integrity, the willingness to pay for the good in question should rise, as Boyce *et al.* find in their study. The extent to which it rises is a good estimate for the intensity of moral threat posed by the change. Likewise, we can imagine situations in which the moral context changes to one that seems enhancing to one's moral integrity, easing the willingness to pay for the relevant good or service. For instance, in the Boyce *et al.* Norfolk pines experiment, instead of (or in addition to) informing one of the participant groups that unsold trees would be destroyed, one participant group could be informed that unsold trees will be used by the public works department to landscape the most neglected parks in the local community—those that have gone to the proverbial dogs. Our model motivates the testable hypothesis that the mean willingness to pay for such trees should fall, as there is a moral cost to purchasing trees in this particular context—those that are purchased for private use will not be available for the public use described above. If the moral context changes to one that seems enhancing to the agent's moral integrity, the willingness to pay for the good in question should fall. This is because relatively less consumption of the good in question is necessary to maintain the agent's sense of moral constitution, and money is freed up for other things in the consumption set (including shoring up the consumption of goods that have a threatening moral context). Analogously, if the moral context is at odds with the agent's, then she will allocate more resources toward preserving her morality vis-à-vis consumption of goods that complement her sense of moral well-being.

In addition to explaining Boyce *et al*.'s findings, our framework supports the existence of what Bulte *et al.* refer to as the "outrage effect." People could be asked for their willingness to pay for environmental improvements with no discussion of the cause of the environmental problem. This corresponds in our model to the non-challenging state of keeping the unsold trees alive—state *A*. Then, as Bulte *et al.* point out, some

causes seem to lead people to lower their willingness to pay (a state even more favorable than *A*, which we do not have in our model above) and some causes seem to lead people to raise their willingness to pay (state *D* in our model). Our current framework does not presently possess enough explanatory power to support or reject the "moral responsibility effect" contested by Bulte *et al.* and upheld by Walker *et al.* Although we can capture the moral context for human responsibility in general, the model does not leave us in a position to more finely ascribe responsibility within that sphere.

In addition to these results, we propose that our conceptualization of morality could resolve some instances of the "preference reversal phenomenon", studied most recently by List (2002) and Cubitt *et al.* (2004). This literature explores instances of seemingly paradoxical choices from the hypothesis that preferences may be unstable (as in stochastic) and/or ill-defined. Our model suggests that this dichotomy should be generalized to a disjunction that includes the possibility that preferences are deterministic (stable, non-stochastic) but are drawn from well-defined state-dependent preferences according to particular moral contexts. If this manner in which moral context affects consumer choice is ignored, observed choices can easily lead social scientists to deduce that preferences are unstable and/or that the choices violate the transitivity assumption required for rationality.

Let us conclude by discussing one area for future research. We have assumed thus far that the arrival of information that changes the moral context is exogenous (as it was in Boyce *et al.*); agents in that experiment found out about the change in moral context for free, and they could not bury their proverbial heads in the sand to avoid being presented with this information. An important issue we have not discussed here is the extent to which an agent acting in our framework would seek out (at the expense of time and/or money) information about the *uncertain* moral context of his or her consumption. We believe we are bound to find a "don't ask, don't tell" result in our model. That is, some agents would rather not be aware of the moral context, as it may ultimately bring them lower net welfare. However, given some initial information about the moral context, other agents may be willing to pay to find out additional details. Such investment in information acquisition does not typically make the moral context crystal clear, but rather increases the likelihood that the agent is consuming in a morally consistent manner.

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