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RATIONALITY AND QUALITATIVE CHOICE
IN AN INSTITUTIONALIST FRAMEWORK:

Will Much 'Cruder and Simpler Arguments'
Really Suffice?

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Abstract

Discrete choice modelling is concerned with the appropriate specification of choice between qualitative alternatives. Choice in this context means either deliberate action by some individual or planning agency or the selection of a certain alternative by social, political or economic forces in the course of evolutionary processes. That latter concept is frequently evoked in the context of institutional choice, the transaction cost approach being just one although prominent approach to this problem.

Discrete choice theory which is the theoretical underpinning of discrete choice modelling is firmly based on the principle of maximizing agents. At first sight, this seems to be contradictory to institutionalist thinking, since most of that literature is explicitly or implicitly rooted in the assumption of bounded rationality and satisficing behaviour. To reconcile these two approaches it is necessary to demonstrate that for many purposes full versus bounded rationality or, for that matter, maximizing versus satisficing behaviour are not so much apart as is somtimes asserted. Our contention is that by properly specifying the informational and decisional background the gap between theses two approaches could be bridged. It will also be demonstrated that discrete choice theory, by avoiding aggregative thinking, is specifically apt to integrate the 'objective and subjective determinants' of a choice problem into a single approach. This is the reason why discrete choice theory could be of help in the analysis of institutional choice and design.

1. Introduction

In a recent paper one of the organizers of this workshop elaborated on the problem of rationality in economics in general and instituional choice in particular (Badelt, 1987). Refering to Herbert A. Simon he argued that the behavioral assumption of satisficing suffices to tackle many economic questions aiming on qualitative statements. To quote the original text: "In these analyses aimed at explaining institutional structure, maximizing assumptions play a much less significant role than they typically do in the analysis of market equilibria. The rational man who sometimes prefers an employment contract to a sales contract need not be a maximizer. Even a satisficer will exhibit such a preference whenever the difference in rewards between the two arrangements is sufficiently large and evident." (Simon, 1978, p.6) Simon concludes: "Analysis can often be carried out without elaborate mathematical apparatus or marginal calculation. In general, much cruder and simpler arguments will suffice to demonstrate an inequality between two quantities than are required to show the conditions under which these quantities are equated at the margin" (ibid.)

For someone who has devoted some time to understand formal models of choice between discrete alternatives these comments are quite striking. The latter strand of modelling, a fast growing branch over the last 10 to 15 years, aims at bringing choice between discrete alternatives to the same formal and "exact" level as the already familiar theory of (quantitative) consumer choice. It yields a methodology firmly based upon the principle

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of maximization and uses a mathematical apparatus hardly to be considered crude and simple. In view of the remarks of Simon, is this mostly futile effort?

The present paper is a result of the cognitive dissonances arousing in us by the fact that we are ardent supporters of discrete choice analysis and at the same time sympathetic to an approach aiming at a more general view of economic behaviour and institutional change. One purpose of this paper is to discuss the concept of rationality as used in the institutional analysis literature. We contribute to an old discussion, originating in the marginalist debate of the fourties with Machlup and Friedman as the leading defenders of the orthodox approach (see e.g. Machlup (1946), Friedman (1956)). Our main argument is that many of the disputes around this point are not a matter of substance but form. As soon as maximizing behaviour is brought back to its informational and decision-making foundations many differences with the supposedly broader concepts of satisficing and bounded rationality disappear.

It is a further aim of this paper to demonstrate that discrete choice analysis is a valuable instrument for an institutional economist, both in theoretical and empirical terms. Despite of its foundation in the concept of maximization discrete choice analysis can handle many phenomena considered central in institutional economics. It can even account for individuals limited competence in decision making in an empirical treatment of problems of institutional choice. Because of its close relationship to neoclassical consumer theory the discrete choice framework can help clarifying the relationship between neoclassical and insti-

tutional economics and narrow the gap between these separate disciplines.

The paper is organized into 5 parts. Section 2 discusses issues of rationality. Section 3 presents some fragments of an economic theory of imperfect information. Section 4 briefly sketches discrete choice theory and illustrates its usefulness by an application to the choice of water supply in an African village. Section 5 gives a summary.

2. Rationality in institutional choice literature

"Bounded rationality" and "satisficing" are major theoretical concepts in institutional economics. In the literature they are used to contrast the neoclassical elements of "rational behavior" and "maximization". The latter are felt to be too strong assumptions loading a much too heavy burden on the individual making some decision. "Satisficing" and "bounded rationality" it is argued are weaker requirements. They allow the individual to be pleased with something good enough and the decisionmaker does not have to go for the very best. He can use some rule of thumb, apply common practice and imitate the behavior of other agents. Thus, it is argued, the behavioral basis of institutional economics is fundamentally different to the neoclassical one.

2.1. Rationality vs. bounded rationality

Despite its central role in most of the respective literature the meaning of "bounded rationality" often remains unclear. Substantial definitions are rarely presented. A good example is Williamson (1985), where the concept of bounded rationality is made a cornerstone of the whole theory but the reader is never told in substance what is meant by it. Simon's definition, although illustrative, lacks substance as well: "The capacity of the human mind for formulating and solving complex problems is very small compared with the size of the problems whose solution is required for objectively rational behaviour in the real world - or even for a reasonable approximation to such objective rationality." (Simon, 1957, p.198)

Assumptions about individual behavior interfuse with the decision making context. Rationality is seen to subsume not only correct decision making but also perfect information (or rational expectations) and the existence of just one type of decision maker. Decision and environment often are mixed-up intentionally.

In our view mixing these two elements brings about misinterpretations and deludes a dichotomy of theories which is actually not existing. A more precise theoretical foundation can be obtained by keeping the decision making process and the decision making environment conceptually separated. It is not "rationality" and "maximization" which are the crucial elements of orthodox neoclassical economics but the treatment of information and the modeling of the decision making environment. We do not see a real need for institutional economics to allow agents to

use the information they have available in a sloppy way. When information is costly and hard to get even the neoclassical homo economicus might use a successful rule of thumb or accept a satisficing alternative.

We advocate to use the term "rationality" in economics just in the same way it is used in decision theory. (see e.g. Raiffa, 1968) An individual behaves rational if it uses the available information in an optimal way, i.e. maximizes its objective function conditional on the information available. It has a strict a-priori meaning and is solely a personal characteristic of the individual. An excellent illustration is provided by Richard Thaler. He comments on the famous billiard player example of Friedman and Savage (1948) by adding to their expert billiard player a novice and an intermediate player. "It is important to stress that both the novice and intermediate players described above behave rationally. They choose different shots than the expert does because they have different technologies." Thaler (1980, p.58). The only difference to our argument is that we substitute technology (skill) by information.

Rational behavior in an uncertain environment also implies collecting the optimal amount of information. A choice has to be made about the sources to exploit and information should be acquired as long as a net benefit can be expected. This is closely related to the decision one has to make. The cost of information can vary greatly not only by source of information but also by personal characteristics like education, age, experience, and all characteristics influencing the opportunity cost of time. So for some collecting further information might be worth the effort

while for others is might be not. Just like for the novice billiard player it might not be worth all the practicing to become an expert player.

Although important the argument we presented above is not new at all. It has been discussed in the literature for some time. Williamson for example comments on it in the following way: "It is sometimes argued that bounded rationality is merely a convoluted way of stating that information is costly. Once this has been acknowledged, maximizing modes of analysis can deal with all of this issues with which bounded rationality is concerned. There is something to be said for this: As Simon observes, a large 'plot of common ground is shared by optimizing and satisficing analysis'. Although one might, on ground of parsimony, recommend that 'we prefer the posulate that men are reasonable to the postulate that men are supremly rational when either one of these assumptions will do' it is easy to understand how others can decide differently. Working within an neoclassical framework is not a benefit that will be sacrificed lightly." (Williamson, 1985, p.46, fn)

For Nelson and Winter, however, fundamental tensions remain: "There is a fundamental difference between a situation in which a decision maker is uncertain about the state X and a situation in which the decision maker has not given any thought to whether X matters or not ..." (Nelson and Winter, 1982, p.67).

This seems to be a rather extreme position. Even institutionalists like Williamson feel uneasy about it. Nevertheless it does not contrast with the concept of maximization. To quote Stigler and Becker, two extreme defenders of neo-classical economics:

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"The making of decisions is costly and not simply because it is an activity which some people find unpleasent. In order to make a decision one requires information, and the information must be analyzed. The costs of searching for information and of applying the information to a new situation are such that habit is often a more efficient way to deal with moderate or temporary changes in the environment than would be a full, apperently utility-maximizing decision" (Stigler und Becker (1977), p.82). Stigler and Becker are here arguing about the individual whereas Nelson and Winter's research object is the firm. But replace the word "habit" by "routine" in the above quotation and in our view there remains no fundamental difference between the positions of Stigler/Becker and Nelson/Winter. The argument of Stigler and Becker is that looking for better alternatives is only worth while when the (expected) utility gain exceeds the costs of information gathering and processing. This clearly includes looking for alternatives of which the decision maker is not yet aware.

When observing these obvious parallels in some of the more recent literature bounded rationality appears to be more a research strategy than a substantial departure from behavioral assumptions. Its main purpose seems to be that by stressing this behavior it is possible to advance to research fields not treated before.

What is lost, however, by substituting strict maximization by the weaker concept is a clear demarkation between different strategies. Nelson and Winter for example fail to show how individu-

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als determine the balance between information gathering and the use of routines.

2.2. The concept of satisficing and optimal search theory

It is illustrative to compare optimal search theory to the institutionalist concept of "satisficing". The latter is often viewed as a weaker and therefore more realistic substitute for the maximization postulate and as a challenge to neoclassical theorizing. When viewed in the light of less than perfect information, however, the dichotomy vanishes completely. What first appeared to be a fundamental behavioral difference turns out to result from a difference in the amount of information available to the decisionmaker. In both cases the decisionmaker tries to make the best out of the situation.

However, the situation is fundamentally different. In an environment of "full information" choosing the action which gives the optimal result is trivial. Since the outcomes of all actions are known beforehand the one giving the maximum result is well identified. When there is less than full information the possible actions have to be investigated. The decisionmaker has to spend scarce resources to learn about the outcome of an action. This establishes a trade-off between the costs of further investigation and the return which can be expected from these actions. A decisionmaker aiming to maximize the return will investigate any further actions only if the best action at hand gives a return below a certain threshold, namely the net expected return of the

actions not yet investigated. The decisionmaker maximizes his return by applying "satisficing behavior".

This is a well known result in the optimal search literature (see e.g. Lippman and McCall, 1976; 1979). The standard search model assumes that the decisionmaker knows the search cost and the distribution by which the returns are generated. When there is an infinite number of alternatives, i.e. search is unlimited, the individual's optimal strategy is to set a reservation value and to accept the first alternative exceeding it. In other words, he searches for a satisficing alternative. It is important to note that this strategy maximizes the decisionmaker's expected return.

Although this model has been modified in numerous ways its basic concept remains rather simplistic. When compared to the way how "satisficing" is used in institutional economics, however, it has one basic advantage: The search model is able to tell us when an alternative is satisficing since the reservation value is determined within the model. Because of its reluctance to an optimization mechanism the institutional framework cannot provide this information.

3. Rational behavior and imperfect information

The information concept of the basic search model assuming the decisionmaker has perfect information about the distribution is rather strange. When doing empirical work no economist ever did know a distribution perfectly. All he ever had was a sample of observations and parameter estimates. As a matter of fact, in a model like the standard search model we assume the decisionmaker to be better informed than we have ever been or will ever be. Nevertheless, assumptions of "perfect information" or "perfect knowledge of some distribution" are more than common in economics. Many economists, although fully aware that there is nothing like a free lunch, seem to be convinced that there is a free inquiry-office for anything.

More reasonable is the assumption that the decisionmaker too gets information from observations. In a search context this means that to each alternative there is information attached about the distribution. So the decisionmaker not only decides whether to accept an alternative or not but also incorporates the new information into his believes about the distribution or collects information to improve the basis for his decision. These activities again are guided by the attempt to increase net benefit, i.e. to maximize some objective function.

The standard economic concepts of full information and perfect information about some distribution appear exotic in this concept. Since the marginal return of additional information decreases with the amount of information at hand nobody will ever attempt to reach the state of perfect knowledge as long as infor-

mation is not completely costless (in terms of money, time, effort, etc.). Going for full knowledge is simply irrational. In a model like this information becomes of crucial importance (Maier, 1985). The decisionmaker has to decide about the amout of information to collect as the basis for a specific decision. This decision, in turn, has to be based upon the individual's a-priori knowledge. The decisions made in such an environment will coincide with the rational/full-information behavior of neoclassical economic theory only by chance. Deviations will result from differences in a-priori knowledge, information cost, and other aspects we will discuss below. But even small deviations might result in substantial distortions of prices and other aggregate parameters (Akerlof and Yellen, 1985) and often there is little hope that the market forces are able to eliminate the deviations. (Russel and Thaler, 1985)

Information costs are an important factor, particularly if we consider that they are not exogenously given. In migration theory the beaten path phenomenon is well known. It describes the observation that links with large migration flows in the past tend to have large flows in the future. Past migrants are a cheap source of information for those staying behind thus lowering the information cost for just one possible destination. A-priori knowledge might be the result of the information transmitted by media and is therefore likely to reflect their orientation in terms of subject, space or social stratum. Mental maps describing our habitat quite precisely but other areas only vaguely seem to exist not only in geographical space but also in social and economic space. Our a-priori knowledge is less accurate for deci-

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sions we need to make only rarely and since we are not used to deal with it even information costs will tend to be higher in these fields.

These phenomena can bring about systematic imbalances. In some markets actors on the supply and demand side interact with systematically different frequency. A good example is the labor market, where individual workers on the supply side usually face personnel managers on the demand side. The latter are specialized in labor market transactions. They frequently hire personnel and thus accumulate a lot more knowledge about wage distributions and other labor market related aspects than an individual worker. If some external changes occur personnel managers can divide the information cost required to learn about the new situation to more transactions. Due to this fixed-cost-degression they will react by acquiring more information faster than the suppliers of labor. Even if during time this information leakes to all agents in the market there is some considerable period where demand is in a superior position over supply. Moreover, it should not be overlooked that the information about the outcomes of all these biased transactions leakes as well. This will enlarge the period of market distortion.

The weaker side of the market has one important strategy it can apply, namely to collaborate. Labor forms unions and other institutions which can among other obligations transfer information to their members e.g. in form of collective wage agreements.

Although the existence of many institutions is related to information they are not necessarily formed in reaction to market imbalances. In many cases they are simply marketplaces for infor-

mation. Take for example scientific journals. Without them it would be very delicate to distribute our excellent scientific findings to the many potentially interested colleagues around the world. Everyone of us would have to maintain a huge archive of addresses and spend an enormous amount of money sending out papers. It is much more efficient to have a journal. Those writing articles know where to submit them and those demanding the information know where to look it up. The editors dont have to care too much about the addresses since the users subscribe to the journal and they even pay for it. However, institutions like that are not neutral. There is usually a "policy of the journal", which favors one type of research and disfavors some other. When the journal is of particular importance in the discipline, the editor's policy will influence the discipline's future development.

Once established institutions have the potential to structure the market. They can filter information, specialize on some specific area (in terms of content and space) or favor one side of the market. Even when biased in one way or the other they are not necessarily challenged by competing institutions, since establishing a new institution requires cooperation from both sides of the market.

As already mentioned the application of habit, routine, imitation, use of rules of thumb, which are usually considered irrational can be clearly rational in an environment with incomplete and costly information. In many cases it might not be smart to use up a lot of resources to accumulate enough information for a sound decision. When the consequences an individual has to expect

from a 'wrong' decision are just minor probably the best thing to do is to trust the decisionmaking competence of others and to follow the crowd or to apply some simple guidlines. Another reason for such behavior might be the fact that the respective decision is made so rarely that no fixed cost degression applies and information gathering therefore turns out to be too expensive.

When the same decision has to be made repeatedly, however, it can become a routine. A lot of information has been accumulated and the behavior deduced from it has turned out to be successful. As long as the environment does not change there is no need to acquire more information. The marginal cost are higher than the marginal return, not just marginally but considerably due to the information which can be deduced from the successful application of the routine in the past. So, even when the routine fails there is no immediate need to revise it. Since the decisionmaker does not have perfect information about any distribution but draws samples this can just be an outlier. It is is even rational to carry on the routine until there is substantive evidence for a change in the environment.

The phenomena sketched in this section have one thing in common. They all indicate that the decision making environment is a crucial factor in individual decision making. It consists of a-priori knowledge, information cost, past experience ("routines") as well as the individual's socioeconomic background, macro parameters, etc. Many of these factors vary greatly over individuals. Their influence cannot be captured by any models dealing with "average" or "identical" individuals.

By assuming perfect information - either about parameters or about their distribution - standard neoclassical economics eliminates these factors from its theories. Probably this is even the main purpose of this assumption. As already stated above, we think that this is the element in neoclassical economics which brings about most of the results particularly institutionalist economists feel uneasy with. The rationality assumption, it appears to us, came under attack by accident.

Dropping the assumption of perfect information has the advantage that statistical theory and the concept of sampling in particular provide a well defined alternative. The institutionalist concepts of "bounded rationality" and "satisficing" on the other hand appear to be still quite vaguely defined substitutes to the assumption of individual rationality.

4. Discrete choice theory

The discrete choice methodology fits the general framework we have outlined above. On the one hand it builds upon the assumption of utility maximization while on the other it is able to take into account heterogeneities in the decision making environment. In principle all of the effects we have discussed above can be captured by a discrete choice model.

It is important to distinguish discrete choice theory, which comprises a decision making rationale, from the statistical mechanics. The latter can be used just as a regression analogy for discrete data without using any behavioral foundation. An example

of this strategy can be found in the paper by Burton A. Weisbrod presented in this workshop.

Static discrete choice theory is derived from the following setup (see e.g. Ben-Akiva and Lerman 1985):

Suppose an individual is faced with the problem of choosing from a finite set of discrete alternatives. We denote the individual by the subscript n and his choice set by C_n. The alternatives cannot be combined arbitrarily and he can choose just one. Following the tradition of Lancaster (1966) and Rosen (1974) the alternatives are described by their characteristics. x_{in} is the vector of characteristics describing alternative i for individual n. The individual we describe by a vector of socioeconomic characteristics z_n. It is a basic assumption of discrete choice theory that the individual can assign a utility measure to each alternative according to the following indirect utility function.

$$U_{in} = V(x_{in}, z_n, \beta) + \varepsilon_{in} \qquad (1)$$

V is a function of the characteristics of alternatives, socioeconomic characteristics of the individual, and a vector of unknown parameters. It represents that part of the evaluation which can be attributed to x_{in} and z_n. ε is a random component. It makes U a random variable as well.

There are two interpretations for the randomness of utility (Domencich and McFadden, 1975). One originates from the psychological literature (for an overview see Luce and Suppes, 1965) arguing that individuals are unable to recognize all relevant characteristics and to properly assign a utility index. Random-

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ness of utility results from the limited abilities of the individual. The economic interpretation on the other hand preserves the concept of deterministic utility maximization at the level of the individual but admits that "the analyst does not have the capability of 'peeping into the head' of each individual and fully observing the set of influencing factors and hence the complete decision calculus, making it necessary to assign a probability to any event selection" (Hensher and Johnson, 1981, p.30). In this interpretation randomness of utility results from the limited abilities of the analyst. In practical terms four major sources of randomness are identifiable (Manski, 1973; Ben-Akiva and Lerman, 1985)

1. unobserved attributes,

2. unobserved taste variations,

3. measurement errors and imperfect information,

4. instrumental (or proxy) variables.

Treating utility as a random variable has some remarkable consequences:

1. because of the stochastic element in the utility function discrete choice models can be applied directly. Other than in the empirical application of most other economic models, where a disturbance is added to a deterministic model, randomness is already part of the theory. Theoretical results are not derived by pretending a deterministic environment.

2. The deterministic model is a special case of the stochastic one. The former is derived from assuming a degenerate distribution for ϵ.

It is important to note that discrete choice theory uses an ordinal concept of utility just as consumer theory. Any order-preserving transformation may be applied to U_{in}.

We assume the individual to maximize utility. He will choose that alternative from C_n which provides the maximum value utility. However, since utility is a random variable all the analyst can make is a probability statement.

$$P_{in} = \text{Prob } (U_{in} \geqslant U_{jn} \ \forall \ j \in C_n) \tag{2}$$

Here P_{in} denotes the probability that individual n chooses alternative i. Because of the assumption of utility maximization this probability is equal to the probability that the utility of alternative i is the largest.

Different classes of discrete choice models can be derived from different distributional assumptions for ε. The two most important are that the ε are independent identically Gumbel and multivariate normally distributed leading to the logit and probit model respectively. While in the binary case these two models give almost identical results (Amemiya, 1981, Horowitz, 1980), in the multinomial case where there are more than two alternatives they differ considerably (see e.g. Daganzo, 1979).

Information about the characteristics of the alternatives, socioeconomic characteristics of the individual, and the choices of the individuals is sufficient for estimating the unknown parameters. Usually maximum likelihood methods are applied for this purpose.

The general framework can be expanded to dynamic modeling as well (see e.g. Heckman, 1981, Wrigley, 1986). Some of the factors we have discussed yield temporal interdependencies in decision making (e.g. "routines"). To obtain reasonable results a model has to take into account this dynamic component.

A highly flexible structure for dynamic discrete choice models was introduced by James Heckman. He substitutes equation (1) by a much more general utility function (for details see Heckman, 1981) which accounts for current and past characteristics of the alternatives and socioeconomic characteristics of the individual, past decisions (structural state dependence), the most recent spell of identical decisions, and the cumulative effect of past evaluations (habit persistence). For a specific application one usually has to make some simplifying assumptions. But even then a model of this type causes some subtile problems. What is needed are data for different time periods with individuals being iden-tifiable over time (panel data). Estimation easily becomes quite cumbersome often requiring time consuming computational methods like numerical integration.

Discrete choice seems to be a suitable methodology for the empirical analysis of a number of institutional choice problems because of the following features.

1. Its explicit purpose is the modeling of choice problems with a finite number of discrete alternatives. This general type of problem corresponds to a number of institutional choice deci-sions.

2. Discrete choice theory is micro-oriented. It allows to take into account the heterogeneity of the population in terms of

socioeconomic characteristics and individual specific diffe-rences in the characteristics of alternatives. Dynamic models allow for phenomena like state dependence and habit persi-tence.

3. The model has a sound behavioral basis rooted in economic decision theory. It also provides a close link to search mo-dels as we have discussed them above (Maier and Rogerson, 1986; Lerman and Mahmassani, 1985).

4.1. An application to the choice of water source

In this subsection we want to illustrate the usefulness of the discrete choice methodology in an institutional choice context. The example is taken from some work of Dale Whittington and Xin-ming Mu from the Deptartment of City and Regional Planning, Uni-versity of North Carolina at Chapel Hill. We are greatful for the permission to use their work in this paper.

The discrete choice model we will refer here is actually a by-product of an attempt to calculate the value of time spent col-lecting water in an African village. The data have been collected in Ukunda, Kenya.

This study is particularly suited for our purpose for two reasons. First it models the choice between different institutio-nal settings. The alternatives for water supply taken into ac-count in the study are

a) open well; water is supplied free of charge but has to be carried home a long distance (10-30 minutes). Well water is considered to have a bad taste.

b) kiosk; water is sold at kiosks but they are usually located closer to the residents.

c) vendor; this is the source with the highest price. However, "almost anywhere in Ukunda a person can step out of his house and hail a vendor" (Whittington and Mu, 1987, p.8).

The second reason why the study is particularly suited for our context is the fact that it applies this methodology to a third world country, where - according to some common stereotype - the concept of rationality applies least.

Whittington and Mu use the following data structure for a single household:

	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9
Vendor	1	0	$TIMED_v$	$CASHD_v$	0	WOMEN	0	VINCM	0
Kiosk	0	1	$TIMED_k$	$CASHD_k$	0	0	0	0	KINCM
Well	0	0	$TIMED_w$	$CASHD_w$	TASTE	0	EDUCT	0	0

The first two variables, named VENDR and KIOSK in the next table, are alternative specific constants measuring the autonomous utility of the respective alternative not captured by the other variables. TIMED is the total time spent collecting water per day, CASHD the total amount of money paid for collecting the water per day. The indices refer to the alternatives. TASTE is a dummy variable indicating the household's perception of the taste of water from the open wells. It is one if the taste is consi-

dered poor, zero otherwise. WOMEN gives the number of adult women in the household, EDUCT the number of years of formal education of the head of household. VINCM and KINCM both give the household's income. They are used alternative specific for vendor and kiosk allowing for differences in the choice behavior of higher income households.

Whittington and Mu applied a (static) multinomial logit model. The results of estimation can be found in table 1.

Table 1. Results of Estimation

Var.	Coeff.	std.err.	t-ratio	sign.level
VENDR	-1.84	2.08	-0.88	0.38
KIOSK	-3.61	1.91	-1.89	0.06
TIMED	-0.055	0.017	-3.13	0.002
CASHD	-0.13	0.042	-2.21	0.001
TASTE	-4.06	1.63	-2.49	0.013
WOMEN	-0.90	0.55	-1.63	0.10
EDUCT	-0.17	0.083	-2.12	0.034
VINCM	0.029	0.053	0.54	0.59
KINCM	0.002	0.048	0.05	0.96

Log-Likelihood Ratio:	-41.5
Restricted Log-Likelihood Ratio	-75.8
Likelihood Ratio Index	.58
Chi-Squared	68.5
Significance Level	0.322 E-13
Number of observations	69

Source: Whittington and Mu, 1987, p.23

The overall model is highly significant. Despite the fact that only 69 observations are available. This illustrates that with a discrete choice model one can obtain reasonable results even from small samples. "The signs of all of the explanatory variables are

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as expected. The variables for collection time, money cost, taste, and education are all significant at the 5% level." (Whittington and Mu, 1987, p.16) For illustrative purpose let us run briefly through the interpretation of their parameters. Collection time (TIMED) and money cost (CASHD) are both generic variables. Their coefficients tell us that an increase in TIMED as well as an increase in CASHD for one alternative would lower the probability of being chosen as a source of water. From the ratio of these two coefficients one can calculate the value of time which amounts to exactly the market wage rate for unskilled labor in Ukunda. The variable TASTE is used specific to the alternative 'well'. So the negative coefficient tells us that families considering well water to have poor taste choose this alternative with significantly lower probability. From the data available nothing can be said about the validity of this opinion and where it originates from. It might be some routine resulting from a bad experience in the past or a simple rule of thumb. People with higher education (EDUCT) tend to avoid the open wells as well. They probably know more about health hazards originating from well water.

5. Summary

This paper dealt with two interrelated subjects: it discussed the concepts of rationality and maximization as opposed to bounded rationality and satisficing and investigated the usefulness of discrete choice in an institutional choice context.

In the first part we contributed to an ongoing debate arguing that the difference between the two competing concepts is not so much a matter of substance but form. Instead of the rationality assumption the simplifying assumptions about information and the decision making environment in general should primarily be attacked and weakened. The main reason is that the results are qualitatively identical but there is a well defined alternative only for the latter assumption.

Some elements of an economic theory with perfect rationality but imperfect information are sketched in section 3. They indicate that heterogeneity and the decision making environment are key elements.

In section 4 we sketch discrete choice theory and argue that it is particularly suited to take into account heterogeneity and the decision making environment at the individual level. Dynamic versions can even account for temporal interdependencies between decisions. This makes discrete choice theory an interesting methodology for empirically analysing problems of institutional choice. We illustrate this by presenting a static discrete choice model dealing with the choice of water source in a kenyan village.

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