INTUITION AND INSTITUTIONS: THE BOUNDED SOCIETY

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The importance of social variables not completely dependent on individual decisions, along with the bounded rationality of human beings, is fundamental in the progress of economic theory. In this paper the relation between intuition, as a mental process that allows mentally bounded individuals to solve complex problems, and institutions, as the rules society imposes on itself, is explored. The conclusion is that they are both representations of a same mental process. Both are redefined, in this sense, and some ideas about institutional change are put forward.

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I. Introduction

"It seems commonly to be assumed that the individual decisions then form a complete set of explanatory variables" Arrow *dixit*, before going through methodological individualism and concluding that "social variables, not attached to particular individuals, are essential in studying the economy" (Arrow, 1994). And he is certainly not alone in this acknowledgment that economics is much more than individual decisions. Arrow emphasizes the importance of social knowledge, something quite clear in endogenous growth models (e.g., Romer, 1986; Lucas, 1988), but leaves the door open to other social constructs that do not depend only in, or can be constructed from, the individual perspective.

Nevertheless, it is not only methodological individualism what lies behind economic theory, but also methodological rationalism. What we have, in Economics, is a handful of models built above a rational individual, and if Arrow doubts that starting from the

individual we can explain the economy, Simon (among others) questions that rationality could be behind theory. It should be clear by now that human beings are not completely rational. Both perception and decision making processes are “bounded” (Simon, 1986). Thus, human beings solve problems in quasi-rational ways, among them intuition. Intuition, in Simon’s words, is a collection of recognition patterns that allows us to find a solution to a problem (Simon, 1989).

On the other hand, efforts to understand those “social variables” have converged to institutional analysis. Although there are different approaches to institutions (Langlois, 1986; North, 1990; Bowles and Gintis, 1993), the importance of social constraints to economic activity has been studied, in recent times, for more than a decade. Following North (1990), institutions are “rules that society imposes on itself," restrictions on the relations among members of a group, or a society. The study of institutions, however, heavily depends on the assumptions made on individual rationality and learning, or shorter, on individual mental models (North, 1994).

In this paper, I will show that intuition and institutions are siblings. One on the individual level, the other on the social sphere, both are the result of the bounded capacity of human beings to solve problems, both descent from the individuals non-rationality.

II. Intuition

Although human beings are believed to be rational, most of the time the problems that have to be solved are too complex to be treated as the rational model would. This means that defining alternative solutions, evaluating them and establishing subjective probabilities, consumes more time and effort than available. Nevertheless, this kind of problems are solved everyday in a time span a lot shorter than the rational model would predict. This supports the idea that an alternative mechanism is being used to tackle complex problems. One possibility is what Simon calls intuition.

It seems that, after exposure to a certain kind of problems, the mind develops certain patterns that allow the solver to reach a solution that may not be optimal, but in face of time, cost and other constraints, is useful. In other words, the mind settles shortcuts that should be used everytime the problem seems to be from the known type. In fact, this is what phisically happen in neural networks, which modify the conductance of certain connectors in order to move information through specific neurons that have proved effective before. (Potter, 1990) In computer software neural nets, after defining the net structure, it is confronted with problems and it is allowed to check the solutions. This “learning procedure” reflects on the weights set on connections, establishing the shortcuts mentioned above. (Churchland, 1990)

As in the case of the neural nets, the time of exposure, or “learning” time, is critical to the pattern setting. Simon states, from data collected by John R. Hayes, that exposure must be continuous for a time span of at least 10 years (Simon, 1989). One conclusion is that expertise becomes mapped into a different mental structure that allows the subject to solve problems, similar to the ones known, in a faster way that those who are not “experts." Thus, intuition could be established as a characteristic of experts. In fact, experts look up at a smaller set of alternatives than “amateurs” do. In the fairly known example from Simon, chess masters very seldom think in all the possible moves from a certain position, “knowing” that many of them must be rejected from the beginning.

We could define intuition, then, as a mental process that allows problem solving in a faster way, by the use of shortcuts developed through extensive exposure to similar problems. Or we could use an alternative definition: *the collection of mental restrictions that reduces the complexity of a certain problem by restricting the set of solutions*. From this viewpoint, intuition is not a collection of shortcuts, but of restrictions that avoid “distractions”, allowing the problem solver to concentrate on a smaller set of possible solutions and reducing the cost of finding the “best” among them.

Note that as experts develop shortcuts for solving an special type of problems, they are also restricting the alternatives that have to be evaluated each time they face them. In

this sense, whenever the expert confront problems that are essentially different to the ones known, the expert's ability to solve them drops significatively, possibly below the amateur level.

Figure 1 shows the relation between time to solve problems and the exposure to problems of the same kind. One of the curves depicted is the fairly known learning curve, that reflects that the time exposed to problems reduces the time needed to solve a new one of the same kind. The other curve has not been studied, to my knowledge, and shows that the exposure to problems **increases** the time needed to solve substantially different problems. The shape of the learning curve is common, but the concavity assumed for the other one is not.

What this figure shows is that exposure to problems increases the ability to solve similar issues, but also reduces the ability to solve substantially different ones. This allows us not only to denote chess masters' ability to play chess but also accounts for the difficulties they may have in understanding domino or football. The same could be said of the intuition economists develop over economic problems and the mental blocking these professionals have to understand political issues. Heiner (1983, 1985) has developed a model, from a different perspective, that takes account of the difficulty of using a rational decision process in an uncommon setting, forcing individuals to react by applying the same solutions they would in more common problems. This leads to his Reliability Condition, which depending on the C-D gap

(the difference between the competence of the individual an the difficulty of the problem), reduces or increases the flexibility to choose potential actions, or to make

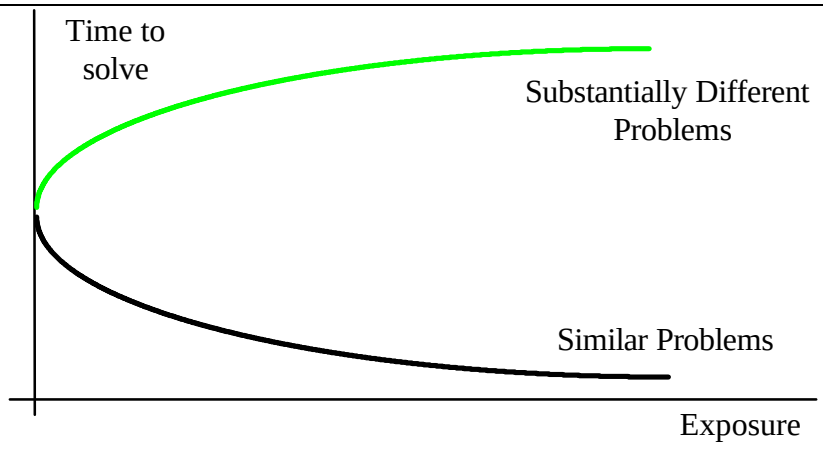

FIG.1 TIME TO SOLVE PROBLEMS

decisions.

III. Institutions

Institutions are the constraints that human beings impose on human interaction. They consist on formal rules (law, for example), informal constraints (conventions, norms) and their enforcement characteristics (North, 1995). For our purposes, the main question about institutions is, why are these restrictions needed?

In his work, Douglass North states that institutions, along with the standard constraints of economics, define the opportunity set in the economy. In this sense, they affect

substantially economic performance, mainly through the existence of transaction costs. Although the effects that result from the existence of institutions are somewhat clear, their origin and dynamics are not so. North suggests that institutions develop in order to reduce the uncertainty faced in every human decision. (North, 1989) Certainly, most decisions involve different degrees of uncertainty from other peoples' behavior or other natural sources.

If we assume that individuals are rational, in the economics sense, then they will be able to solve any problem if it appears in the form of a set of prices and quantities, no matter the size of it. The only possibility of errors in decisions would be in the form of information lacks and as a result of market incompleteness. This means that some future markets may not exist, forcing the individual in present time to make decisions not knowing some subset of prices, this we normally call uncertainty.

On the other hand, if we recognize that human beings are not rational in the economics sense, they may not be able to find solutions to problems even in a totally certain environment, since the problem may result too large to be computed. In this case, intuition may be used to solve the problem, using the information accumulated in preceding problems. Since many economic problems have been here for centuries, the *social exposure* to them is large enough to find the worse alternatives and hinder them. Thus, institutions restrict relations to reduce complexity. This means that social

constraints are developed not only to reduce uncertainty, but also to reduce complexity.

Notice that we could also understand institutions, conversely to what we did in the case of intuition, *as the shortcuts developed by society in order to solve social problems*. More than that, we could put intuition and institutions closer by stating that the latter do not only reduce uncertainty, but complexity. As intuition helps the mind to solve complex problems, by reducing the alternatives, so institutions help society to solve complex social problems by reducing the solutions society can choose among.

IV. An Example

We can use Law as an example of an institution. Following North, what Law does is to reduce uncertainty by establishing markets to cover future possibilities in the present. Essentially that is what contracts stand for. Transactions costs in this example would be the ones associated with the definition and enforcing of this contract.

Now, in our definition of institutions, Law should reduce complexity and not only uncertainty. Take homicide as an example. Homicide is considered a crime, and is therefore punished when proved. Punishing homicide reduces uncertainty in that it becomes “costly” to kill other people, and this, we hope, reduces the possibility that

someone murders us in the future. It also reduces uncertainty in that if we kill someone, we know that if caught we will be punished.

How does it reduce complexity? Since we know that homicide leads to punishment, all the solutions that include murdering someone become restricted and the set of alternatives that we have to evaluate reduces. This will lead us to suboptimal solutions, in many cases. When suboptimality is too costly, the routes that include homicide would also be analyzed, although this will take more time.

V. Institutional process

Note that starting from our definition of institutions, the process of institution creation and development becomes clearer. Many institutions emerge from calculational difficulties. Measures are just an example: Although we could easily use a "personal" measure, it is a convention, a social restriction, to speak of meters, feet, inches, and not one's lenght of foot. Time (as measured) is an institution that reduces the cost of calculating the sun's position and our latitude, although it also reduces uncertainty.

When institutions are defined as restrictions that reduce complexity, political institutions become easier to understand. Congress by no means decreases uncertainty, but it certainly reduces complexity in social decision making.

The problem of how institutions emerge and develop is also easier to see with this definition. Assume a certain group of individuals face a problem in dividing the outcomes of a production process. Say this group consists of three elements, each one with a different idea of distribution. The method they will ultimately select does not depend on uncertainty but also on easiness. It is the case of companies, although economic theory states that they should receive what they marginally contribute to production, the distribution process will finally be one where calculations are easier. Workers will receive a wage, more or less similar to what all believe is their marginal contribution, executives will receive a salary on the same basis, and shareholders will get the rest. As production goes by, rewards will be adjusted.

Two points have to be made here. First, institutions, like technology, seem to be path-dependent (North, 1995). This means that once a constraint is established on certain social relation, the next institution would be created along the same path the first was (e.g., common law). Second, understanding institutions as shortcuts makes clearer that they are not efficient, but stable. In other words, institutions are not constructed to make relations (economic relations in particular) more efficient, but more stable. In this sense, shortcuts in social problem solving will reach suboptimal solutions, looked from the efficiency perspective.

VI. Conclusions

Starting from the intuitive reasoning defined by Simon, this paper has redefined institutions as shortcuts developed over social relations in order to reduce complexity in social problem solving. This definition includes North's of "uncertainty reduction" while broadens to incorporate different issues related to: a) the process of generating institutions, here equated with a mental process as intuition; b) a less restrictive assumption on individual and social rationality; and c) the process of institution development, viewed both as restrictions and shortcuts in social decision making.

This new definition is not only a matter of economic theory, but more importantly, a link between cognitive and social sciences, and could be the starting point to redefine economic theory for individuals that differ essentially from the *homo economicus* in rationality, objectives and social relations.

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