Perspectives on Epistemology of Economics

Essays on Methodology of Economics

A TELEOLOGICAL CAUSAL MECHANISM FOR ECONOMICS: SOCIO-ECONOMIC MACHINES

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1. Introduction

In the last years, given the problems of the so-called 'received view', a new kind of explanation has appeared in the realm of the philosophy of science, the causal mechanism explanations. This kind of mechanism has been applied to different disciplines. In the area of social science we can mention the works of John Gerring (2008, 2010) and Colin Wight applying it to politics. The paper proposes to combine Nancy Cartwright's conception of capacities and nomological machines with Amartya Sen's capabilities in order to enact a causal mechanism for economics.

On the one hand, Cartwright, professor at the LSE, holds that what she calls "capacities" are real causes of the events. She also maintains that when causes combine in a stable way they produce patterns of behavior in nature we can explain. She proposes calling this arrangement of stable causes a 'nomological machine' (NM). On the other hand, Sen speaks about 'capabilities', as freedoms or possibilities of the human persons. Both Cartwright and Sen relate the terms capacities and capabilities to closely related Aristotelian concepts. Thus, this relation between capacities and capabilities suggests that we can combine these concepts to achieve certain results of interest to us in life.

The introduction of capacities and capabilities implies a revision of the epistemological and anthropological assumptions of current economics. The capabilities of Sen are the capacities of Cartwright in the human realm; human

capabilities are the real causes of events in economic life and should be seen as the basis of their explanation. Institutions, moreover, are like 'socio-economic machines' that allow us, through our use of practical reasoning, to appraise, deliberate upon and guide our decisions about capabilities (Cartwright's capacities in the human world). Institutions thus embody practical reason and insert certain predictability in human affairs.

2. Socio-economic machines

Cartwright speaks about complexity, reflexivity and lack of control as causes of additional difficulties in explaining causes in the social realm (2007, p. 42). She also speaks about the derived nature of social capacities. They depend on social, institutional, legal and psychological arrangements that give rise to them, i.e., underlying structures that can be altered. Thus the social field entails a special kind of NM, a socio-economic machine (Cartwright 2001 and 2002). These socioeconomic machines, given the nature of the economy, should be highly local: they are associations 'generated by particular social and economic structures and susceptible to change by change in these structures' (Cartwright 2002, p. 141). Referring to one example that she provides, she asserts:

> Each of the countries studied has a different socio-economic structure constituting a different socio-economic machine that will generate different causal relations true in that country and concomitantly different probability measures appropriate for the quantities appearing in these relations (Cartwright 2002, p. 143).

For Cartwright (2002, p. 143), we need arguments both at the phenomenological and theoretical level to achieve knowledge of those local particularities. Models are blueprints of those socio-economic structures (Cartwright 2002, p. 150). On the one hand, these blueprints must maintain a close relation to the specific situation they aim to explain. On the other hand, the greater the scope of the related institutions, the greater will be the universality or scope of the socioeconomic machine.

This story, however, does not end here. I propose we deepen Cartwright's concept of a NM. What kind of reality is it? It is a real configuration of stable causes, 'a system of components with stable capacities' (1999, p. 49). However, there is a nuance in Cartwright's concept of NM when it refers to the social field. In these cases, rather than an established arrangement that is 'there outside' and that is only explained, a machine is a system built by us as a way of producing a result. Consider the following passages:

> In building the machine we compose causes to produce the targeted effect (1999, p. 65). …you give me a component with a special feature and a desired outcome, and I will design you a machine where the first is followed by the second with total reliability (1999, p. 72). … [W]e always need a machine (…) to get laws – (…). Sometimes God supplies the arrangements –as in the planetary systems– but very often we must supply them ourselves, in courtrooms and churches, institutions and factories (1999, p. 122).

> Just as the science of mechanics provides the builder of machines with information about machines that have never been constructed, so too the social sciences can supply the social engineer with information about economic orders that have never been realised. The idea is that we must learn about the basic capacities of the components; then we can arrange them to elicit the regularities we want to see. The causal laws we live under are a consequence – conscious or not– of the socio-economic machine that we have constructed (1999, p. 124).

That is, while in subjects such as physics we have one kind of machine, another kind of machine that could be labeled as 'practical' is more suitable for technical and practical fields. This is an arrangement meant to achieve a particular result. Thus, the machine suitable for the physical field may be called natural machine in the sense that it stems from a natural arrangement and naturally produces its effect, without intervention of outsiders, and is a 'theoretical' machine in the sense that we

know it without intervening or trying to change it. 'Practical' machines are especially relevant for Cartwright. She stresses the importance of the *construction* of regularities (see, e.g., 1989, p. 182). As she states in the Introduction to *the Dappled World*, 'I am interested in intervening'. So the question is: 'how can the world be changed by science to make it the way it should be?' (1999, p. 5). In the Introduction to *Hunting Causes and Using Them* (2007, p. 1) she adds that the three questions, what are our causal claims, how do they know them, and what use can we make of them, play a central role.

In this second kind of machines, i.e., practical, with its correspondent design, there are roles for theoretical, practical and technical reason. By using theoretical reason we 'learn about the basic capacities of the components' (1999, p. 124) of the practical machine, and about the relationships among them:

> We must develop on the one hand *concepts* [...] and on the other, *rules for combination*; and what we assume about each constraints the other, for in the end the two must work together in a regular way. When the concepts are instantiated in the arrangements covered by the rules, the rules must tell us what happens, where *regularity* is built into the demand for a rule: *whenever* the arrangement is thusand-so, what happens is what the rule says should happen.
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> Developing concepts for which we can also get rules that will work properly in tandem with them is extremely difficult, though we have succeeded in a number of subject areas (1999, p. 56).

These concepts and rules are known by theoretical reason. We also make use of technical and practical reason to design rules. Both uses of reason are implied in the quoted statement: 'how can the world be changed by science to make it the way it should be?' (1999, p. 5). We have to define how the world should be – practical reason's role– and how this can be achieved –the task of technical reason in combination with practical reason in the way we organize productive actions.

How do we design these practical machines? Their design starts with their blueprints. For Cartwright, theory is not enough:

> The theory gives purely abstract relations between abstract concepts. For the most part, it tells us the capacities or natures of systems that fall under these concepts. (…) No specific behavior is fixed until those systems are located in very specific kinds of situations. When we want to represent what happens in these situations we will need to go beyond theory and build a model, a *representative* model. And (…) if what happens in the situation modeled is regular and repeatable, these representative models will look very much like blueprints for nomological machines (1999, p. 180).

This kind of model, Cartwright holds, 'provide precisely the kind of information I identify in my characterization of a NM' (1999, p. 53):

> All these models provide us with a set of components and their arrangements. The theory tells us how the capacities are exercised together (1999, p. 53). In a nomological machine we need a number of components with fixed capacities arranged appropriately to give rise to regular behaviour. The interpretative models of the theory give the components and their arrangement (1999, p. 187).

In the formulation of models, theoretical reason also has a key role. We must take into account all the relevant factors and their relationships. As Cartwright argues:

> The situation must resemble the model in that the factors that appear in the model must represent features in the real situation (…) But it must also be true that nothing too relevant occurs in the situation that cannot be put into the model (1999, p. 187).

Models can have explicative (theoretical) or productive (practical) roles, depending on their subject. Practical and technical reasons intervene in the design of the latter category of models. For Cartwright, in economics, we often use these latter models:

> Models in economics do not usually begin from a set of fundamental regularities from which some further regularity to be explained can be deduced as a special case. Rather they are more appropriately represented as a design for a socio-economic machine which, if implemented, should give rise to the behavior to be explained (2001, p. 278).

One task of economics is the explanation of economic events. Another is the prescription of individual or economic behaviors in order to reach a goal, a normative task. This normative character may be practical (related to ends) or technical (related to means). Hence, we might postulate different types of socioeconomic machines and models: theoretical and practical machines and models. Practical models have two tasks: determining and prescribing ends and means. Theoretical reason provides the concepts and knowledge of causal links for both kinds of machines. Practical and technical reason enters into the second kind of machine and model.

Human and social ends are not simply data but a task to be performed. Thus, they are normative. We can assume that man is rational, but he is also often irrational. As an empirical postulate, rationality often fails. This is why socio-economic theoretical models will frequently fail. Instead, we can always use rationality as a normative postulate.

Practically-designed machines are also local but they share some common principles. They are of two types: 1. a few general anthropological constants of human beings that are capacities, and 2. some capabilities that can be assumed as ends in practically-designed socio-economic machines. These capabilities are in themselves capacities and, in addition, they are capacities of the human realm. We need to look for specific derived principles for each situation.

In sum, socio-economic machines assume general principles but need to be local, adapted to the conditions and institutional arrangements of each situation. As mentioned, the broader the institutions, the more universal in their applicability, because, in fact, institutions are practically-designed devices that insert

predictability into the realm of hazard and freedom. We need theoretical reason to know their specific natures and conditions that affect their working. A specific economic policy, for example, is a design of a socio-economic machine. It defines goals and means to attain them. Both the goals and the means may coincide or not with social and individual goals. Then, disturbing causes may interfere. The alignment of policy and people goals is the difficult task of practical reason; once achieved, the road of technical reason is more straightforward. This alignment of goals and design of the way to attain them is the work of a practical model.

Practically-designed socio-economic machines are the work of practical reason concerning ends and of technical reason concerning means, also using theoretical concepts. The contingency of the practical field is overcome by designing it. Institutions may manage and provide legitimacy to this work of theoretical, practical and technical reason. Institutions actually are socio-economic machines.

3. Capabilities are human capacities

Let us briefly consider the connection between these two theoretical concepts, Sen's concept of capabilities and Cartwright's concept of capacities. Essentially, Sen's capabilities are what Cartwright regards as capacities in the human world. This might be argued in two ways. First, it is suggestive that both authors, Cartwright and Sen, employ very similar concepts (capacity/capability) and that both authors link these concepts to closely related Aristotelian concepts, i.e., nature (*physis*) for capacities and potentiality (*dynamis*) for capabilities. Thus Cartwright asserts with respect to *physis*:

> Still, I maintain, the use of Aristotelian-style natures is central to the modern explanatory program. We, like Aristotle, are looking for 'a cause (*aitia*) and principle (*arché*) of change and stasis in the thing in which it primarily subsists' [the definition of nature (*physis*) in Aristotle's *Physics* II, 1, 192b22], and we, too, assume that this principle will be 'in this thing of itself and not *per accidens*' (1992, p. 47; 1999, p. 81).

Nature, as Cartwright holds with Aristotle, is a stable –not *per accidens*– principle or cause. This is why she indiscriminately speaks about natures or capacities (which are for her stable causes), and in her book *Nature's Capacities and their Measurement* (1989) maintains that capacities or natures are powers. Sen asserts with respect to *dynamis*: 'the Greek word *dynamin*, used by Aristotle to discuss an aspect of the human good (sometimes translated as 'potentiality'), can be translated as 'capability of existing or acting' (…)' (1993, p. 30, footnote 2; see also 45 footnote 41).

The meaning of the Aristotelian concept of potentiality (*dynamis*) is capacity, faculty or power. For Aristotle, potentiality is a principle of change (*arché*; *Metaphysics* 1046a 4-6). Potentiality or capacity (*dynamis*) is the dimension of nature related to the source of its actuality. Aristotle also distinguishes between two types of capacities (*dynameis*): not rational and rational. Rational capacities imply the intervention of deliberate decisions of agents (*Metaphysics* 1048a 7-15).

Sen's capabilities are rational capacities in themselves: capacities of, e.g., being free from hunger and undernourishment, achieving self-respect and social participation. This is a first sense in which capabilities are capacities.

There is a second sense in which capabilities are capacities. When Cartwright speaks about explanation in terms of causes in science she refers to the four Aristotelian causes (1989, pp. 219-224). Final cause triggers the action of the other causes. This can be said of all effects but is especially clear in the human realm. People have reasons to act. Thus capabilities are also capacities, because they are the final causes or reasons to act in personal and social actions. I agree with Nuno Martins (2006, p. 672) when he interprets Sen's notion of capabilities as a specification of the ontological category of causal power. He asserts: 'Sen's approach is not just the 'capability approach to *welfare* economics', but the *capability (or causal powers) approach to economics* as a science, an approach where the emphasis is on potentiality, freedom and openness' (2006, p. 680). Similarly, John Davis (2002, p. 490) maintains that 'in Sen's framework, capabilities can be thought of as powers that individuals can develop.' According to

Smith and Seward (2009, p. 216) 'capabilities *are* causal powers (a '*power to*') that provide the *potential* to realize particular functionings.' They also argue that they are like tendencies that do not act deterministically. These characteristics fit with the nature of the practical realm and with Cartwright's conception of causes.

To summarize, Cartwright's capacities are then internal powers of things acting as stable causes, and Sen's capabilities are Cartwright's capacities in the sense of being faculties or possibilities but also in being rational and free causes of the human realm.

4. Back to socio-economic machines

The CA has three essential characteristics: the heterogeneity of persons and their capabilities, the incompleteness of the ordering of those capabilities, and thus the need for practical reason or public discussion to deliberate about our capabilities and their hierarchy. This situation stems from human freedom and diversity, and can be managed by a reflective agents exercising practical reason.

We should add that institutions are a way of giving a material embodiment to the outcomes of practical reason thus stabilizing the relevant causal relationships. In this sense, the link established in the previous section between capabilities and capacities can be very useful. The idea that capabilities are capacities reinforces the idea of building socio-economic normative machines. These machines would overcome the problems raised by the social world: they insert stability and thus predictability into the world. In this way they secure the work of practical reason.

We manage practical affairs by building models which originate in normative policies. These policies would shape socio-economic normative machines. The objectives of these policies would be capabilities chosen with the aid of practical reason. Capabilities as final causes thus provoke adequate arrangements to achieve them. Thus, these socio-economic machines will be the embodiment of the effective work of practical reason.

Human freedom inserts, by definition, a factor of unpredictability. Although we can have complexity in the physical realm, human complexity includes this

unpredictable factor. Additionally, the human realm is a realm of reflexivity and lack of control, as Cartwright (2007, p. 42) argues.

The only way to manage the human future, subject as it is to these characteristics, it is to transform the practical (free) aspects of human or social action in technical way, fixing ends and means, and calculating the best allocation of the latter into the former. This has been an ancient desire of human beings. The earliest testimony to this ambition is expressed in Plato's dialogue *Protagoras*. He looks for a procedure of choice that would save us from the contingency of 'luck'. Aristotle realized that customs and routines are means that help to consolidate a predictable tendency (see, e.g., *Nicomachean Ethics* VII, 10, 1152a 26-7). Social pressure, laws and organizations produce predictable behaviors. All these means are often gathered under the label of 'institutions' in a broad sense. Institutions are then socioeconomic machines that produce the intended results.

The alignment of qualitatively different ends is facilitated by the reduction of their different qualities into a common quantity. Numbers are homogeneous and pragmatic. As Theodore Porter (1995, p. 86) asserts, 'numbers are the medium through which dissimilar desires, needs, and expectations are somehow made commensurable.' Expressing realities in numbers facilitates decisions. Porter (1995, p. 8) also states, 'quantification is a way of making decisions without seeming to decide.' How, then, could we reduce choice about qualitative features to a quantitative calculation? This is the question raised by Plato. He asked: what science will save us from the unpredictable contingency? and he answered: 'the science of measurement' (Protagoras, 356e). Human beings strive for security, and measurement helps to promote it. Martha Nussbaum accurately notes that:

> What we need to get a science of measurement going is, then, an end that is single (differing only quantitatively): specifiable in advance of the techne (external); and present in everything valuable in such a way that it may plausibly be held to be the source of its value (Nussbaum 2001, p. 179).[1]

[1] See also Elizabeth Anderson (1993, 3.1).

Institutions apply standards, procedures and measurement devices. Once the crucial step of making practical definitions is advanced, institutions establish technical processes to achieve them. Given that often these technical aspects impact on practical aspects, the process of designing technical proceedings is not accomplished directly but requires further adjustments.

Among these technical tools, index numbers provide a straightforward homogeneous representation of multiple factors. This homogenization, however, has its limits. However, we have to reach a middle ground position: although the reduction of qualitative concepts to quantitative measures will always be imperfect, we need these measures. Numbers conceal complex realities, and relevant meanings are lost in the process of commensuration, but numbers are still very useful.

Note, then, that when making these reductions to numbers, we must recall, for example, that ends are plural and incommensurable, and entail values that can only temporarily be hidden. As Sen (1999, p. 80) contends, 'the implicit values have to be made more explicit.' Quantitative reasoning is not enough, and thus Sen also stresses the need for using practical reason to scrutinize the ends we aim for (2002, pp. 39 and 46). Alain Desrosières (2008, p. 10) expresses this well, remarking that to quantify implies attaining a consensus on how to measure ('convenir et mesurer'). He adds that 'to postulate and to build a space of equivalence allowing quantification and thus measurement is at the same time a political and a technical act' (2008, p. 13).

Ends –capabilities in Sen's words– are the causes of human and social actions. They can be known by theoretical reason, without making value-judgments. However, as I have explained, this is the realm of unpredictable disturbing causes. The consequence is that, previously, we need to normatively establish and consolidate those ends. The way to achieve this is to build a practical socioeconomic machine.

Designing a model of the socio-economic normative machine must include the practical work of discovering or deciding on its ends or goals. Institutions, Sen recently wrote (2009, p. xii), 'can contribute directly to the lives that people are able

to lead in accordance with what they have reason to value.' Nobody wants to act in order to attain a set of ends that has not been chosen by him/her. Nobody wants to be an automaton. Every person should participate in a reasoned definition of shared goals, or at least should be informed about them and be free to adhere to them or not. One of the objectives of every policy is freedom itself. That is, there is a field of consensus about objectives and another field of deliberate freedom. Once the work of practical reason is done, we need to define the kinds of institutions needed to accomplish the resulting capabilities/ends, and also try to reduce them to a quantitative measure. This quantitative measure will be a first approximation for the particular situation. A thorough analysis will need to then return to the qualitative capabilities that compose the common measure.

5. Conclusion

Social science and more specifically economics need to reincorporate theoretical and practical reason. An exclusively technical approach leads to a partial analysis that is far from being relevant and unable to explain real phenomena without distorting them. Nancy Cartwright's argues that capacities are real stable causes that configure NMs, and theoretical reason has a primary role in producing knowledge of these capacities and their relations. Sen is not satisfied with a merely quantitative evaluation of poverty, equality and development. He urges us to take into account the heterogeneity of human persons, their situations and goals. Given that capabilities are the ends of persons and societies and that they are the causes of their actions, they are known and determined by practical reason. In this way, this later use of reason also re-enters into social science. 'How do we combine capacities and capabilities and work to achieve certain results of interest to us in life?' My proposed answer is: 'We must understand how practical reason is institutionalized in the world in the sense of being embedded in practices and procedures that allow people to solve practical problems that require the exercise of practical reason.' We must build a socio-economic machine and the corresponding model to define and determine capabilities (theoretical and practical

reason) and look for the best means to attain them (technical reason). The socioeconomic machine will produce these wished-for goals. The construction of this machine calls for a model of it. The HDI of the UNDP is an example of this kind of models. In the HDI we need to define concepts, to discover or deliberate on capabilities (which are the ends that are determined as dimensions to be considered) and their rules of combination, in order to technically combine them. That is, the HDI uses theoretical, practical and technical reasons. Cartwright's conception of capacities and machines, and Sen's capabilities (that are Cartwright's capacities in the human and social realm) are combined in this model and in the machine that it tries to produce and represent.

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