CALCULUS AND FREE WILL IN THE ECONOMIC DECISION

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Abstract

Starting from the Derrida's belief (i.e., the freedom begins where/when the calculus ends), the paper discusses the frontier between the necessity and the liberty in taking the economic decision. In the context, the necessity is thought as being the logical consequence (effect) of the calculus, while the contingency is thought as being the logical consequence (effect) of the liberty. Moreover, the paper discusses also the free will as opposition to the necessity generated by the calculus. Finally, all the three paired concepts (necessity/calculus, contingency/liberty, free will/free won't) are systematized into a quasi-rational mechanism of economic decision in order to explain the actual economic behavior.

Keywords: free will, calculus, necessity, contingency, rationality model

JEL classification: A10, B4

Some conceptual clarifications

<u>Rationality</u>: a logical inference from premises to conclusion, based on the four principles of bivalent logic[15]. There are four categories of rationality:

a. the *autonomous rationality* (AR): involves derivation of non-empirical conclusions from non-empirical premises;

b. the *habit rationality*[16] (HR) involves derivation of empirical conclusions from empirical premises;

c. the *rationality based on faith* (FR) involves derivation of non-empirical conclusions from empirical premises;

d. the *practical rationality* (PR) involves derivation of empirical conclusions from non-empirical assumptions.

Table 1

A logical inference from premises to conclusion

	Empirical premises	Non-empirical premises
Empirical conclusions	**HR**	**PR**
Non-empirical conclusions	**FR**	**AR**

<u>Model of rationality</u>: a logical device that generates necessarily and invariably[17] conclusions from premises based on their own semiotic principles.[18]

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[15] The principle of identity (A = A is valid), the principle of non-contradiction ($A \wedge \bar{A}$ is invalid), the principle of the third excluded ($A \vee \bar{A}$ exhausts the possible), and the principle of sufficient reason. **Aristotle** introduced the first three logical principles, and, the **Leibniz** introduced the fourth.

[16] Based on habits.

[17] What can be said in this context about **Gödel** effect (effect generated by the **Gödel** theorem)? Our view is that a response of indetermination type (which is the answer of the theorem of **Gödel** to the question about the completeness of an axiomatized epistemological system) is still an answer based on the model of rationality.

[18] There are three semiotic principles: a) the principle of semantic: relationship between the sign and its referential (denoted); b) the principle of syntactic: relationship between signs (whether in sentences or in predicates); c) the principle of pragmatic: relationship between the sign and the sign user.

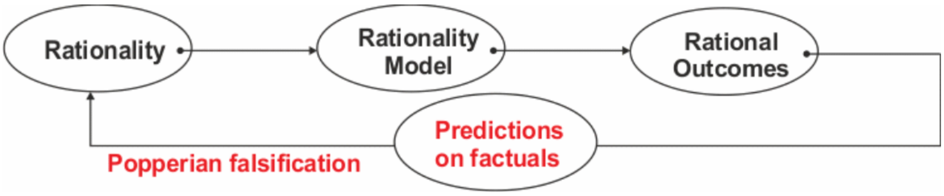

Figure 1. Model of rationality

Calculation: any finite episode in the operation of a model of rationality.[19]

Result (conclusion): any intelligible result of a calculation.

Decision: any conscious acceptance of a result, regardless of its significance or meaning.[20]

Necessary: a state parameter of an entity (for example, a system) that is inherent of that entity (system).

Rational decision: any decision which necessarily results from a model of rationality, using the accepted rules of logic inference.

Necessary decision: equivalent to rational decision.

Behavior: any praxiological objectification of a decision, regardless of the way used for this objectification.

Rational: a state parameter entity (for example, a system) that is necessarily required by that entity (system) within a model of rationality.

Irrational: a state parameter entity (for example, a system) that is inconsistent with that entity (system) within a given model of rationality[21]. For example, it will appear for a Keynesian economist as being irrational the policy decision aimed to stimulate the supply[22], while for a monetarist economist, it will appear as irrational the decision of economic policy aimed to stimulate demand.

A-rational: a state parameter entity (for example, a system) that cannot be associated with the functioning of any model of rationality accessible[23].

Free will: a state parameter entity (for example, a system) that allows that entity (system) can to oppose (through ignorance, modification, rejection, etc.) to the necessity.

Necessity: space of behavioral occurrence where the free will is impossible.

Freedom: space of behavioral occurrence where the free will is general.

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[19] For example, the operation of a universal **Turing** machine.

[20] The significance leads to the denotation, while the meaning leads to the connoted. Somehow, the meaning is subjective version, customized, individualized significance. Therefore, while the signification can have a public character, the meaning is always of a private one. Typically, the signification is inter-subjectively communicable while the meaning is not (for example, a religious or an aesthetic experience is not communicable inter-subjectively, at least in a discursive way; however, in non-discursive ways - such as the artistic one – the meaning could be shared inter-subjectively).

[21] So the irrational does not have a pejorative sense, it does not mean anything undesirable, sub-optimal, in-acceptable etc., it means, simply, that it cannot be logically derived from a given model of rationality. Therefore, the irrational is, actually, very present in the social behavior decision (and therefore in the economic decision), but this does not mean something wrong, something to be avoided etc.

[22] An example is the recent decision by the government of Romania to reduce the social contribution rate by 5 percentage points (pp). It is obvious that the measure is likely to stimulate the demand (for example, by reducing labor costs, which would boost employment, which would increase the supply). A Keynesian would immediately ask the question: why would an employer to hire more labor, i.e. to increase the supply if there is not an increase in the demand (even before the supply growth)?

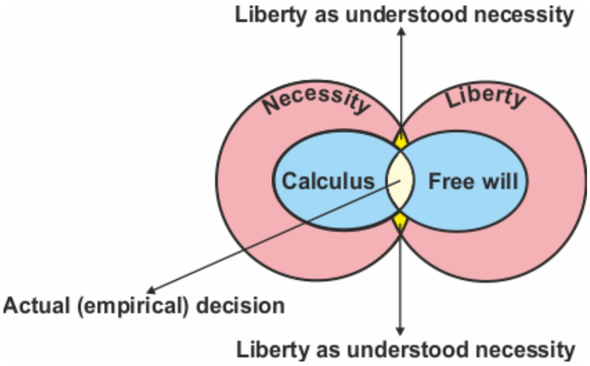
[23] This includes, in particular, affects-based behaviors. There are, however, many authors which consider the irrational is also associated with the affects. This position is, in our opinion, at least negligent, but more correctly it must be evaluated as wrong. So a decision (or behavior) that appears as irrational them against a model of rationality may seem perfectly rational in relation to another model of rationality, while the a-rational cannot be assigned to any available model of rationality (of course, from a diachronic perspective, may appear in future models of rationality that to "reclaim" the rational or irrational decisions that today appear as a-rational).

Contingent decision: decision taken within the area of freedom.

Effective decision: decision taken in the space given by the intersection of necessity and freedom[24].

Four theses on the relationship *calculus - free will*

In this section we make some considerations on the relationship between calculus and free will. In fact, the pair *calculus - free will* is not a primitive conceptual pair (source conceptual pair), but a derivative (secondary) one. Thus, it is a true reflection of the genuine primitive conceptual pair: pair *necessity - freedom*.



•***Thesis 1***: *No calculus-based decision is of the free will nature*

The argument in supporting this thesis is as follows: once elected a model of rationality, the result (conclusion) is of necessary type, i.e. of the type of logical necessity. Since the necessary is inconsistent with the free will, it results that the result (the conclusion) generated by a model of rationality is outside the "territory" of free will[25].

Question: What can be said about the situation in which rationality model provides more than one result (conclusion), and a choice must be made among them?

Answer/Comment: In this case we need another model of rationality aimed to choose among the decision alternatives previously provided by the initial model of rationality. This new model of rationality will provide, however, in a necessary way too, an answer on that particular new decision to be adopted. So it remains still in the "territory" of necessity.

The consequence of the answer: the possible free will must be sought with a step back, namely at the level of rational choice model (either the original or the choice between several alternatives for decision provided the original model of rationality).

•***Thesis 2***: *No choice of a model of rationality is of the free will nature*

The argument in supporting this thesis is as follows: choosing between models of rationality is equivalent to choosing between alternative decisions provided by a given model of rationality: simply we can call the rationality models among which we must make a choice as being…alternative decisions. These alternative decisions are just the individuals from the list of the models of rationality provided by the meta-model of rationality[26].

Question: What can be said about the criteria for choosing between models of rationality provided by a meta-model of rationality?

Answer/Comment: This time we have to develop a deeper analysis: we will say that these criteria should be derived from a key-principle. The key-principle is understood as a founding principle[27] of

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[24] The real, actual decision, we are facing in historic (concrete) space-time history is always of an effective decision type. Obviously, the actual decision is an empirical one.

[25] More generally, it is outside the area of freedom.

[26] Obviously, a meta-model of rationality is still a model of rationality. The concept of meta-model of rationality - defined as a model of rationality that provides as results (conclusions) a list of models of rationality - is a very interesting concept of epistemology but it will not be developed here, of course.

[27] It is understood that the concept of *principle* is not a positivist concept (it is not verifiable factual, and is not derived from a repeatable experience such would require, for example, **Hume**) but a metaphysical one. However, in our view, human behavior in general cannot be scientifically built without a metaphysical base,

any rationality[28]. It should be noted that the key-principle (principle of foundation) is an absolute invariant (or, in any event, with a very large invariance, for example, the duration of existence of a Universe with its own physical constants)[29].

<u>The consequence of the answer</u>: again, the free must be sought with a step back, namely among the founding principles.

•***Thesis 3***: *the only invariant criterion (key-principle or foundation principle) able to substantiate a <u>generic</u> model of rationality is the human nature*

The argument in supporting this thesis is as follows: the human nature is generated, in a fundamental way, by non-cultural factors[30]. This makes the human nature invariance is ensured just by its necessary character[31].

<u>Question</u>: could the socio-biology provide a background explanation (i.e., of the key-principle nature, or of a principle of foundation nature) of the human behavior?

<u>Answer/Comment</u>: We consider that the answer must be yes, on one condition: the uniformity of explanatory action[32]. The problem is that the human nature, just by its characteristic to remain in the background (because it is the only way to be invariant and uniform) is a *das Ding an sich*[33]. So, what is the phenomenon, i.e., the knowable objectifying, associated to the human nature? We believe that this knowable objectification is the *human condition*.

<u>The consequence of the answer</u>: the human nature, when objectified through the human condition, no longer holds the property of invariance. In fact, the human condition is human nature altered by the culture. But the culture is a contingent phenomenon, so non-necessary and non-uniform.

•***Thesis 4***: *the sole criterion (non-invariant) able to substantiate an actual model of rationality is the human condition*

The argument in supporting this thesis is as follows: the human condition is the phenomenon, while the human nature is the noumenon (*das Ding an sich*); thus, in terms of historical, what grounds a model of rationality is always the human condition; as, by definition, the human condition is contingent, it will be non-invariant, although it is the only operational criteria for ground an effective model of rationality[34].

<u>Question</u>: the contingent nature of the human condition does not compromise its role to substantiate any effective model of rationality?

<u>Answer/Comment</u>: in fact, choosing the key-principle (the founder principle) is the only free choice (under the empire of the free will); for example, the choice of axioms in an explanatory or praxiological system is arbitrary[35], that is, it is under the free will.

<u>The consequence of the answer</u>: the only time (in the logical sense of the term) when acts the free will is when the key-principle (founder principle) of the model of rationality is chosen. Everything that follows as logical moments: building the model of rationality, choice of the alternative decision from the list provided by the model of rationality (including choosing the model of rationality

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however this may sound paradoxical for someone who equates the scientificity with the classical positivism (i.e. that of the Vienna School, especially the **Carnap**'s).

[28] For example, the key-principle (the foundation principle) of scientific knowledge is the principle of causality. The principle of causality is not a positivist principle, although it grounds any imaginable positivism.

[29] For example, the founding principle of homo œconomicus model of rationality (we refer to the primary version directly derived from considerations of **Adam Smith**, without the subsequent adjustments) is the *principle of selfishness*.

[30] Here, the biological factor is determinative. In this context, we believe that economists would do well do not avoid a serious documentation in the socio-biology, despite a negative reputation, undeservedly “won" by this discipline.

[31] As it is known, the cultural is contingent (by contingent will understand the possible non-necessary).

[32] For example, without connotations of racial or other type of segregation.

[33] The thing in itself (in German).

[34] Similarly, the positive law must be interpreted as a phenomenal reflection of the natural law.

[35] The term *arbitrary* has not a negative connotation, it means, simply, discretionary and, above all, means non-criterially. Choosing the key-principle (principle of foundation) is not a rational choice, that is, it is not a necessary one.

himself, if the founding principle allows construction of several alternative models of rationality) are results obtained by calculus, so necessary results.

Some conclusions

- ✓ any calculus (no matter whether quantitative or qualitative, simple or sophisticated, rationality model-based or intuition-based) requires social decision (and therefore economic) necessarily; therefore, any calculus takes us inevitably, on the territory of necessity;
- ✓ if is it possible to take a decision (or to motivationally ground a behavior) without calculus, then this decision is of the free will nature, because it opposes the potential necessity; noted that opposition to the necessity refers to opposition to the necessity generated by a model of rationality[36] (and, hence, by the calculus involved) and not in opposition to the necessity in general[37];
- ✓ the free must be sought and found in the background of the rational choice model, namely in choosing the key-principles (founding principle) for the rationality model choice;
- ✓ although theoretically the key-principle (the founder principle) in choosing the model of rationality is the human nature, it cannot be operationalized since it is "blocked" by his phenomenological stance: the human condition (that is, the human nature altered by the culture); therefore, the free will is manifested only in the logical time of choosing the key-principle (principle of foundation) generated by the human condition, based on which the model of rationality is chosen.

[36] We believe that there is much work both in terms of probability modeling of social phenomena (and therefore economic) and on modeling through what is called game theory. We report an epistemological error encountered, in a more obvious degree, in the game theory: players' reaction functions are modeled (so we have a pre-existing model of rationality) through a reaction matrix (containing, as components, action strategies or reactions) which is common (and known) to both players (if we consider, for example, the duopoly). Even if the two players would have different reaction matrix (known or not by the another player, depending on the sophistication of the game) it will still be the same model of rationality for both players: this means that each player will have the same reasoning structure with each other, that is, each will consider the rational behavior of the other, from his point of view (see here, for example, the prisoner's dilemma, where the model of rationality is common). Of course, this assumption provides a very elegant mathematical modeling, but it is equally certain, it is very far from the actual behavior. However, if we consider that the two players make decisions based on different models of rationality (unknown to the other partner), the whole game theory loses all meaning.

[37] It is important to insist on this point: opposition to the necessity, in general, is impossible, but opposition to a sectorial (local) necessity (for example, a necessity imposed by a model of rationality) is possible. In addition, we would say, it is quite common, given what we call rational or irrational behavior in the social field (and therefore in the economy field). Authors like **George Akerlof**, **Daniel Kahneman**, **Dan Ariely**, **Jon Elster**, **Leonard Mlodinow**, to mention just a few of the most cited, dealing extensively (although, in our opinion, in a relatively unsystematic way, from the epistemological perspective) with the behaviors so-called irrational or a-rational.