

**BRIDGING CULTURE AND RATIONALITY:  
FOUR MODES OF EXPLANATION IN ECONOMIC SOCIOLOGY.**

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*How do culture and rationality matter in economic life? I identify four different traditions, bridging culture and rationality in explanations of economic life. On one side, two models define rationality as an independent variable and, one of them, culture as a dependent variable. On the other side, two models define culture as an independent variable and rationality as a dependent variable. Such circularity leads to a question: how do these theories dialogue?*

## **BRIDGING CULTURE AND RATIONALITY: FOUR MODES OF EXPLANATION IN ECONOMIC SOCIOLOGY.**

What is economic “rationality”? Such a question is the object of central debates in socio-economic theory. And however, systematic comparisons of the different and often opposed definitions of rationality are few. Very often, sociologists state that they disagree with rational choice theory based on the fact that they include no attention to the study of culture networks or institutions, but they do not fully demonstrate the type of invalidity characterizing rational choice theory (Is it just implausible? Is it a wrong description of cognitive processes?). On the opposite, rational choice theorists often argue that maybe cultural anthropologists might be true in saying that “culture” has some significance, but that until now, it has not produced any systematic axiomatic comparable to their theory. Based on these positions, the debate can last a very long time, without any dialogue engaged between the different traditions.

This paper is an attempt to map out different axiomatics of rationality, based on a reading of the different socio-economic theories: neo-classical theory, game theory, conventionalism, institutionalism and actor-network theory. This paper therefore tries to create a dialogue between these different theories, and in order to do so, it describes in four different sections, four different definitions of rationality, based on the answers that these theories give to five different questions: (1) Is rationality a universal uniform cognitive process? (2) Is rationality an individual characteristic? (3) Is rationality based on morality? (4) Is rationality a central causal concept in explanations of economic life? (5) Is rationality a cultural construction? Other questions might be also relevant to create a dialogue or to stress oppositions between theories. I chose to ask these questions to theories because they stress the role that culture plays in the theories of rationality, opposing on one side, theories that assume that rationality is an universal and individualistic process with no connection to culture, and theories which assume that rationality is cultural construction, whose specific manifestations represent central objects of study.

On one side, two axiomatics define rationality by a set of hypotheses and culture as an observable variable. The first axiomatic is the neo-classical one, and the second one is based upon extensions of its program in game theory. I will show however that without changing the individually-based universal definition of rationality as a cognitive process, “culture” does not have the same status in both axiomatics (becoming a decisive variable in the second of these axiomatics, whereas it is a useless object for economic theory in the first one). I will then present two other axiomatics based upon sociological definitions of rationality. These two other axiomatics define culture as an independent variable characterizing rationality, therefore considered as the dependent variable.

The four next sections define four axiomatics, which gather sometimes various theories. In a sense they are larger than theories, to the extent that all theories use some of this limited number of modes of explanations, but in other way, theories are larger to the extent that they are composed of various of these modes of explanations. The identification of these axiomatics is not supposed to be exhaustive. Indeed, the literature covered is far from being exhaustive, but tries to be representative of some positions in economic sociology.

## ***OPPOSING RATIONALITY AND CULTURE: THE NEO-CLASSICAL AXIOMATIC***

Neo-classical economists long posited that the “rational” agent was conforming to the Enlightened individual, and that rationality was individually-constructed, universal, and that the well-known rule of optimisation of utility fitted with the general “progress” of nations. Neo-classical economists diffused such a conception of rationality at the turn of the century, assuming that the economic agent had complete and perfect information on the world. By complete information, neo-classical authors mean that the rational economic agent conceives all possible states of the world and all the gains attached to these possible states. By perfect information, they mean that the rational economic agent does not know all the states of the world. Here I examine the construction of rationality that was developed after World War 2, when neo-classical theory was reformulated in order to integrate “information” as a “thing-like” commodity in the rational calculus. I show how neo-classical economics kept the same construction of rationality even in cases characterized by problems of information.

### *1. An individual cognitive property.*

Confronted with the idea that individuals take their decision in situations where information is incomplete and imperfect, the neo-classical theory succeeded in maintaining its definition of rationality, based on Von Neumann and Morgenstern’s<sup>1</sup> abstract model of decision under risk (although as remarked by Mirowski<sup>2</sup>, the neo-classical renewed definition of rationality was far from the two authors’ initial ideas on the subject<sup>3</sup>). One year after the publication of Von Neumann and Morgenstern’s essay, Friedman and Savage (1948) reformulated what they interpreted of this theory<sup>4</sup> in such a way that the modelization of decisions in situations of risk, (where the information is incomplete: not all the gains in the possible states of the world are certain) would fit with the neo-classical definition of rationality. In situations of risk<sup>5</sup>, Friedman and Savage take from Von Neumann and Morgenstern the idea that economic choices are like lotteries, and that an economic agent comparing lotteries (e.g. a possible states of the world, with a fixed gain corresponding to one action, and with fixed objective probabilities for each gain). Then, Savage, in 1954, extended their model of rationality from situations of “risk”, where probabilities are “objective”, to situations of “uncertainty”, where the list of possible states of the word is not finished and the information is incomplete. He showed that even when the information is incomplete, the rational economic agent is supposed to process the information that he gathers like if he was in an isolated island, or, as Mirowski points out, like an econometrician, who follows the one “scientific” manipulation of information: (1) he looks for quantifiable variables (so that the aspect of the problem is the one of a bet in a lottery) even when the problem resists quantification, (2) he then collects information on the supposed states of the universe and then

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<sup>1</sup> Von Neumann, John and Oskar Morgenstern. 1947. *Theory of Games and Economic Behavior*. Princeton: Princeton University Press.

<sup>2</sup> Mirowski, Philip. 2002. *Machine Dreams. How Economics Became a Cyborg Science*. Cambridge, UK: Cambridge University Press.

<sup>3</sup> Mirowski (2002) clearly differentiates Von Neumann’s thought on “complexity”, which challenges the Enlightened conception of an individual, making choices in an isolated fashion, from its latter re-interpretation by game-theorists and neo-classical economists. I present here only the reference to Von Neumann as his followers use it.

<sup>4</sup> Friedman M. et Savage, L. J. 1948 “The utility analysis of choices involving risk”. *Journal of Political Economy*, vol. 56 ; Hirshleifer J., et Riley J. G.. 1979. “The analysis of uncertainty and information : an expository survey”. *Journal of Economic Literature*, 17.

<sup>5</sup> Friedman and Savage follow the classical definition of risk and uncertainty given in Knight, F. 1921. *Risk, Uncertainty and Profit*. Boston: Houton Misslin; New ed.: 1965. New-York, Harper Torchbooks.

(3) he posits a simple “as if” objective function, assuming that the set of designated possibilities form a closed system as the econometrician invokes “ceteris paribus” if necessary to void the fact the list of his variables cannot be exhaustive (when the situation is “uncertain”, the probabilities of gains “subjective” and not objective, but the rational procedure is of the same kind, revealed ex-post by the choices of the individual<sup>6</sup>), (4) and he uses statistics to calculate his expected utility, even though there still exist uncertainties and unknowns of the problem as portrayed, (5) and he finally compares the expected utility of the bet with his expected utility of not entering in the game; and he enters the game when the expected utility of the gains of the lottery<sup>7</sup> (and not the expected gain) is higher than the expected utility of the situation without risk (the choice not to bet).

So rationality, in this model, consists in an individual way of processing information, by attributing probabilities to states of the world, like in an isolated island, as if the decision that the agent takes does not change the world itself and the possible states of the world. In both cases, the individual is here the “centre of calculus” and the numbers that he is contemplating and manipulating are supposed to be given “by nature.” He does not consider if making such a decision will alter the future states of the world, as every calculus is a one-bet choice. This is an hypothesis that game theorists will try to reformulate, including the anticipation of the potential effects of his action on the constitution of lotteries of gains, whereas in this version of the theory, discontinuity between every bet is assumed, which leads to assume that the economic agent is outside of collective determination and even historical determination. In this version of rational choice theory, the well known individually-based definition of “rationality” that the first generation of neo-classics conceived is not threatened by the consideration of problems of information.

## 2. *A universal cognitive process.*

Like in the Marshallian model of rational decision in situations of certainty, the models of rational decision under risk and uncertainty, the “theory of expected utility”, as it is called, defines in an uniform fashion the way rationality processes information and decides a choice (by maximization of utility). The new theory assumes that all agents have the same calculative capacities: the cognitive “manipulations” that economic agents process on the information they gather are equal for every one, based on the assumption that the human mind is the same in all individuals, and that it conforms to the universal rules of mathematics. But in the latter one, rationality is defined in a more complicated way, as economists must add more conditions to the rules of calculus in order that agents can mathematically process an operation of maximization of expected utility. Basically, Friedman and Savage derive from Von Neumann and Morgenstern some rules of manipulation of the “system of information” (consisting in all possible states of the world, with objective or subjective probabilities) which portray the economic rationality as a capacity to classify lotteries, decompose them, reduce

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<sup>6</sup> See **Savage, 1954**. Such a model of rational choice in situations of uncertainty has found many applications, mainly in theories of insurance and finance : Leland H., 1968 “Saving and uncertainty. The precautionary demand for saving”, *Quarterly Journal of Economics*, vol. 3. Or, in insurance theory Diamond and Stiglitz have found a way to extract individuals’ function of aversion to risk from their choices of portfolios and insurance policies; in Diamond P., et Stiglitz J. 1974. “Increases in risk and in risk aversion”, *Journal of Economic Theory*, 8.

<sup>7</sup> This function can be log-linear as Nicolas Bernoulli assumes it, when discussing the fact that it is the expected “utility” of the gains of the bet, which determines the entry in a game and not the expected gains of the bet. For other experimental construction of curves of aversion to risk, see in particular: Yaari M., 1969. "Some remarks on mesures of risk aversion and on their uses". *Journal of Economic Theory*, 1; Arrow, K.J., *Essays in the Theory of Risk-bearing*. Amsterdam, North-Holland, 1971.

them, include new ones, in one term, to multiply mathematical operations.<sup>8</sup> But even though these calculative capacities are bigger, this theory does not take into account that agents must learn how to operate these manipulations, and can have different capacities.

One branch of economics has tried to verify such universality of rules of manipulation of lotteries. It has inferred from this so-called theory of “expected utility”, predictions on the shape of curves of “iso-utility” (that is to say combinations of gains that are identical from the point of view of his utility) between lotteries, and has designed experiments in laboratories (with students to whom the experimenter asked to classify lotteries) in order to test it. The construction of rationality of Von Neumann and Morgenstern predicts, for instance, that, according to the “rule of independence” (stating that when he adds a new lottery in his system of information, he does not modify the rest of the hierarchy of preferences), curves of iso-utility will be parallel lines in the triangle of “Marshak-Machina,”<sup>9</sup> that is to say in the visual representations of the exhaustive set of possible states of the world (a list of lotteries with three possible gains with known probabilities). Under different experimental conditions, each rule of manipulation of lotteries has been tested in different protocols, the most famous one, being the one of Allais (1953), which challenges this particular rule of independence. Allais showed that even economists (as his guinea pigs were economists invited at an internal conference on rationality!) contradicted the hierarchies they established between lotteries when they considered new lotteries<sup>10</sup>. Therefore, immediately after it was constructed, this axiomatic was partly rejected as implausible, even for characterizing the mind of economists, whose methods of calculus this construction of rationality however reproduced! But since it started, the controversies never ended, and for instance, Kahneman and Tversky (1979) explained such a discrepancy between this model of rationality and the revealed functions of utility, by showing the existence of an “effect of certainty,” which explained why in very peculiar situations (which characterized Allais’ experiments), the model of “expected utility” did not work, but that it worked all the rest of the time, etc.<sup>11</sup> To these psychologists, even the

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<sup>8</sup> A cognitive set of rules defines the mathematically legitimate “manipulations” of the complete set of lotteries, so that agents can maximize their expected utility: (1) the *rule of classification*, stating that the agent can build exhaustive and coherent (that is to say, transitive) hierarchies between different lotteries; (2) the *rule of reductionism*, stating that he can reduce complex lotteries to its simple elements, and that, according to a *rule of continuity*, he can create complex lotteries from simple ones; (3) the *rule of independence*, stating that when he adds a new lottery in his system of information, he does not modify the rest of the hierarchy of preferences.

<sup>9</sup> The orthogonal “triangle of Marshak Machina,” is constituted of two sides of length 1, corresponding with the probabilities assigned to events happening in lotteries (of three events representing different gains, otherwise, the three points are only one). This triangle gives an easy way to represent curves of iso-utility as it represents sides (identified with gains) and probabilities to happen (identified with the corresponding metric on the side). See in particular Machina M., 1987. *The Economic Theory of Individual Behavior Toward Risk : Theory, Evidence and New Directions*. Cambridge: Cambridge University Press; Machina M., 1987. “Choice under uncertainty : problems solved and unsolved”. *The Journal of Economics Perspectives*, vol. 1.

<sup>10</sup> Allais M. 1953. “Le comportement de l’homme rationnel devant le risque, critique des postulats et axiomes de l’École américaine”, *Econometrica*, vol. 21.

<sup>11</sup> **Kahneman and Tversky. 1979.** Responding to the explication of this effect, some models have tried to integrate it within the paradigm defined by Von Neumann, Savage and Friedman. They therefore include a function of “distortion of subjective probability”, which takes into account the “effect of certainty”, or the “effect of loss” (stating that when confronted to a bet where they can lose some money, agents are more risk-averse than in a bet involving the same expected gain, but without possible losses) that Kahneman and Tversky have defined. See in particular: In the “triangle of Marshak Machina,”, it means that the “curves of indifference” between lotteries of different events are

discrepancies are universal, and they only concern a minor point in the overall definition of rationality. The experimental verification of the universality of cognition is still controversial.

### 3. *Satisfying algorithm and one best way.*

However, one can think that economists have responded to the potential criticisms according to which such a complicated definition of rationality is not likely to be universally shared, as the capacities of calculus are very big. Indeed, it is well known that authors, like Stigler (1961) and Simon (1972) have defined a new algorithm characterizing the decision-process: to them, individuals choose an action when the potential gains are “satisfying” and not “optimal”: so even though economic agents have strong capacities of cognition, they follow a decision process that seems more plausible, as they just stop counting when they are satisfied with one potential lottery. So it seems that neo-classical economists have defined another “best-way” to calculate to the extent that they changed the algorithm of optimisation. But one should not be fooled by the introduction of such a new algorithm! Paradoxically, the introduction of this solution of “satisfaction” corresponds to the introduction of even higher capacities of calculus, as the one-best-way “satisfying” algorithm of decision is deduced from the internalisation of “information” as a variable on which the economic agent can process a decision of optimization: to Stigler (1961), what seems to be an algorithm of “satisfaction” to agents having complete information is in fact an algorithm of optimization extended to decision where the gathering of information is internalised. Therefore, when problems of information exist, the algorithm of decision might be different depending upon the complications given to the model, but the solution of “satisfaction” is actually a complication of the model of calculus and not a simplification: Stigler’s model assumes some even more complicated capacities in the definition of rationality, as the agent maximizes a variable, considered before as internal and costless. So if one wants to complicate the model, one could say that the agent must also optimise the “costs of calculus”, which are even more costly than costs of information gathering (learning to calculate is longer than just finding the information to process). But such an infinite regression would lead to a theoretical dead end, and would destruct the coherence of the model, as Savage (1954) noticed in his article on expected utility under uncertainty. So, the theory usually recognizes only one best way of taking decisions (the optimisation), and sometimes substitutes another algorithm, when the model takes into account some increased cognitive capacity (optimising the gathering of information), but it cannot include an optimisation of costs of calculus, and therefore it cannot internalise the idea that economic agents would have different cognitive capacities of calculus. This is one strong theoretical limit criticized by “actor-network theorists,” who, as we will see, focus on the contrary on the asymmetries of capacities of calculation.

### 4. *The central cause of actions.*

Until now, we saw that the neo-classical construction of rationality has been saved at the cost of describing a cognitive process that may seem even more implausible. But authors succeeded to present a construction of rationality fitting with the neo-classical model. Therefore, this construction of rationality can have the same central place that the previous one had in neo-classical theory, according to which rationality drives the whole assignation of “prices,” which in the long run, are supposed to drive the whole system. Therefore, to these authors, rationality is a central hypothesis explaining economic development: the individuals and the corporate groups involved in economic life are supposed to be animated, if not solely

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not following the axiomatic of rationality when they are close to the sides of the triangle. But they do, when they are in the middle of the triangle. **Quiggin (82) Yaari (87) et Allais (88).**

at least predominantly, by considerations of self-interest maximisation, or at least satisfaction. Such a definition of rationality, as universal and central in the explanation of economic development, explains why neo-classical models are opposite with cultural conceptions of economic development. They even de-legitimise the validity of cultural analysis of economies. Neo-classical economists state that in the long run, this conception of rationality, which is independent from “culture,” as it is universal, will prevail in leading all economic development. It is this articulation between such a definition of culture and rationality that I will expose with greater details now.

##### 5. *Opposing culture and rationality.*

The extent to which rationality is central in this theory is proportionate with the extent to which “culture” is peripheral. This theory makes no room to cultural meanings in his definition of rationality, as it assumes that decisions are motivated based upon the expected utility of individual monetary gains. This idea comes along with a conception of capitalist development, as based upon the “commodification” of the economic agent’s labor, work, emotion, passion, and culture, which refers to the process by which one of these entities becomes embodied in one “product”, attached to a quantifiable price (“monnetization”), and whose only source of valuation comes from the market (“marketization”). Marketization” is essentially the extension of a general institutional arrangement conditioning economic transactions, in which economic agents can follow in “a free intercourse,” the maximization of their interest. Indeed, the general idea of the market among neo-classical economists is based upon Cournot’s definition:

Economists understand by the term market not any particular marketplace in which things are brought and sold, but the whole region in which buyers and sellers are in such a free intercourse with one another that the prices of the same goods tend to equality easily and quickly (Cournot, cited in Callon 2002)<sup>12</sup>

The market is a place where people meet “freely”, on a concrete market, that is supposed to be always the same, and at the same time, it is an abstract process of aggregation of supposed identically constructed utility function. This is an assumption that we will see is criticized by “actor-network theory” and institutionalist theory, to the extent that the rules of “price discovery” on markets are not always following the Walrasian rule of comparison of aggregated curves of demand and supply.

But, this assumption that the markets are the place where aggregated curves of demand and supply meet harmoniously, without the interference of culture is a general hypothesis on the development of capitalism. This view of the market corresponds with the idea that Polanyi (1994) analysed when describing the progressive dis-embeddedness of the economy from society<sup>13</sup>, and from culture, which, according to him, started with the “commodification” of the land in England at the end of the eighteenth century with the Enclosure Act, leading to the privatisation of common parcels of lands, and which was followed by the commodification of “labor”, with the introduction of the “Speenhamland system”, resulting in the destruction of past qualifications and solidarities, and in the mobilization of a growing number of unqualified wanderers in small factories. The disjuncture between rationality and culture was manifested by the growing emergence of a

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<sup>12</sup> Callon, M. and F. Muniesa (2002). “Economic Markets as Calculative and Calculated Collective Devices.” New York Conference on Social Studies of Finance, Columbia University and the Social Science Research Council, May 3-4.

<sup>13</sup> Polanyi, K. (1957 (1944)). *The Great Transformation: The Political and Economic Origins of Our Time*. Boston, Beacon Press.

market for “labor”. In such a world characterized by the commodification of everything, and particularly labor, the neo-classical definition of “rationality” well formalizes the process by which individuals accept to get involved in any relations based on a rational calculus of “expected utility”. Indeed, one might stop arguing that neo-classical conceptions of rationality are only valid in laboratories if the laboratory has extended to the real world, as the capitalist form of exchange is supposed to break symbolic logics and traditional meanings, and hence to destruct the significance of “culture” in economic life. This shows that the neo-classical construction of rationality can escape criticisms of implausibility, if based upon such a vision of capitalist development: in such a world, it seems plausible that individuals will develop very the big calculative capacities upon which the theory of expected utility is based. This theory of markets best helps neo-classical theory to escape theoretical dead ends presented above.

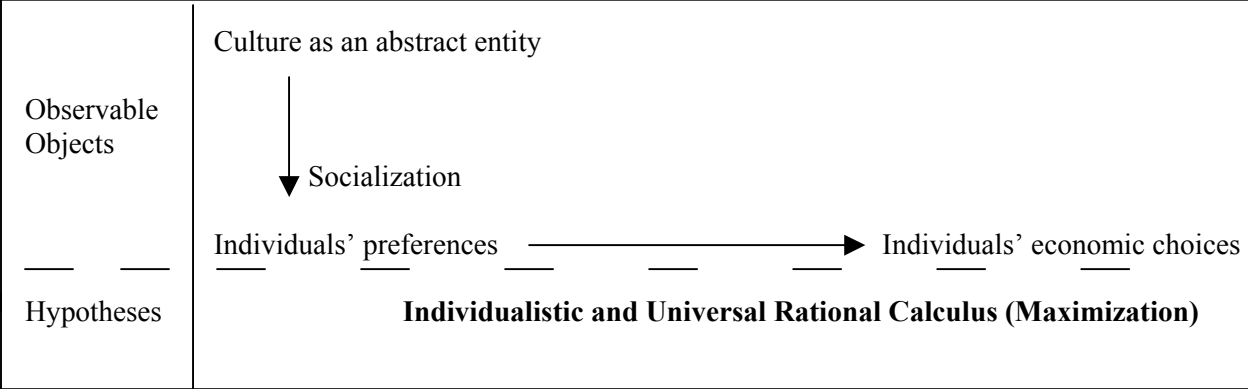
From the point of view of tenants of the universalistic and a-cultural axiomatic of rationality, the only way that, what Zelizer calls the “Hostile Worlds”<sup>14</sup> mode of explanation, can be over-passed is to conceive that culture might have an economic significance as it partly helps explain the determination of tastes and preferences. Neo-classical theories of rationality suppose that preferences are individual, totally subjective, but they are likely to agree that they can be culturally determined. And to this extent, the neo-classical paradigm can be articulated with more cultural perspectives, which do not question the a-cultural determination of rationality. So if economists analyse the way rationality explains individuals’ economic choices, for given individuals’ preferences, sociologists and anthropologists can study how culture, defined as a set of abstract norms, constructs these “given” preferences. In both cases, authors argue that rationality does not depend on culture, and that culture does not depend on rationality. Adapted to the study of consumption, such an analysis corresponds for instance to certain readings of Bourdieu’s *Distinction* as he describes different habits of consumption and preferences among different social and cultural classes<sup>15</sup>. According to Coleman, for instance, Bourdieu’s research project starts where the neo-classical one ends, and Bourdieu does not challenge neo-classical assumptions on rationality, as his analysis fits perfectly with the way neo-classical economists model economic decision-making as a rational optimisation. Also, when Sahlins demonstrate that the economy is dependent upon symbolic order changes when it concerns traditional family-community driven economies, and that only “preferences”

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<sup>14</sup> Zelizer, Viviana. 1997. *The Social Meaning of Money*, Princeton: Paperbacks. Many normative theories assume that there exists a clear dichotomy between the worlds of rationality and markets on one side, and the worlds of culture and community on the other side. According to neo-classical economists, the first side of the opposition corresponds to the one-best-way of economic development, as I recalled. But to others, who have a nostalgic vision of pre-modern societies, where culture and economy were supposedly harmoniously intertwined, the “commodification of the world” rimes with the “disenchantment” of the world (that is so often referred to Max Weber’s analysis of the “iron cage,” in which capitalist economies imprison individuals) by casting away the significance of any symbolic and cultural meanings in the assessment of economic values. Nowadays, recent debates among economists have re-actualised the significance of these opposed schematic and normative visions of the economy, have lead to strengthen the opposition between culture and rationality. The conflict between advocates of culture or the ones of rationality, just reinforces the boundary between the two and leaves no room to people who question the *analytical legitimacy* of such a boundary. See: Albert, M.. 1993. *Capitalisme contre capitalisme*, Paris, Seuil, 1991, *Capitalism against capitalism*, London, Whurr ; Kuttner (1997). *The Loss of Happiness in Market Democracies*; Katz, Richard. 1999. *Japan: The system that soured: The rise and fall of the Japanese miracle*, London and Armonk, M.E. Sharpe. Rifkin, Jeremy. 2000. *The Age of Access . The new Culture of Hypercapitalism Where all of life is a Paid-For Experience*. Forrester, Viviana. *L’Horreur économique*.

<sup>15</sup> Bourdieu, P. 1984. *Distinction. A Sociological Critic of Judgement*. Cambridge, MA: Harvard University Press.

(perceptions of goods and economic roles, but not the functioning of markets and firms) are dependent upon such webs of meanings in a “market-industrial society”<sup>16</sup>. This absolute division of socio-economic phenomena into two aspects, e.g. culture and rationality, leads social scientists to map out the relationship between rationality and culture as follows:



**Figure 1: Culture and Rationality in the “Hostile World” Conception.**

***DEDUCING CULTURE FROM RATIONALITY***

In this part, I explore a second body of knowledge on rationality, which explores when blank-point of the former neo-classical theory of rationality. As I said, the theory of “expected utility” makes the assumption that the individual is in an isolated island, to the extent that the action he makes will not transform the possible future states of the world. Game theory responds to a large extent to such assimilation between the economic agent and the econometrician. But Knight (1921) already noticed the problem: he pointed out that when the investor reduces uncertainty to risk, by mapping out a non-exhaustive list of events and assigning “subjective” probabilities, he paradoxically increases the “global” uncertainty on the market, as the assignment of subjective probability brings another type of uncertainty for other investors. How other investors will anticipate on each other’s assignment of probabilities is a major problem. So Knight pointed out that neo-classical theory did not tackle this problem of “strategic uncertainty,” and as far as the economic agent, as opposed to the econometrician, does not live in an ivory tower but makes choices which interfere with others’ on the possible future states of the world, such a blank-point is very problematic. I will show in this section the theoretical construction of rationality that game theorists built in order to formalize this problem. And I will show that paradoxically, their attempt to integrate this construction of rationality with the neo-classical paradigm have lead to theoretical dead ends.

*1. Individualistic Rationality: the Internalisation of Society in the Individual Choice.*

Neo-classical theorists largely ignored “strategic uncertainty” until they gave one solution, which fitted with the individualistic definition of rationality. The solution was once again derived from Von Neumann and Morgestern (1947) who modelled the “strategic uncertainty” with the help of the “two persons game” (assuming that all kind of “global” strategic uncertainty can be reduced to a game between two economic agents: an “Other” and a “Me”

<sup>16</sup> Marshall Sahlins, 1976. *Culture and Practical Reason*. Chicago: University of Chicago Press.

agent)<sup>17</sup>. And once again, the reinterpretation of Von Neumann and Morgenstern's model of strategic uncertainty along with the lines of neo-classical reasoning based the definition of "rationality" at the individual level. Nash (1954) took care of this reformulation in individualistic terms, as his model of "two persons game" describes the cognitive procedure characterizing economic "rationality" in an environment of strategic uncertainty as happening in the mind of one abstract economic agent before he acts<sup>18</sup>: this models states that gains of the different plays are "common knowledge", that is to say that the individual can make anticipations on the Other player's gains, but also on his anticipations of his gains, and this *ad infinitum*<sup>19</sup>. Rationality of economic agents is represented by the capacity to build infinite reflexive anticipations on one situation. The fact that this intertwining of infinite anticipations, called "common knowledge", is neither processual nor temporal, but happens in the individual's mind fits with the neo-classical definition of rationality. Therefore, in the definition of rationality given in the so-called "game theory", using whether Nash equilibriums, whether "sequential" equilibriums<sup>20</sup>, the assimilation between the rationality of an economic agent, who attributes probabilities to possible states of the world *ad infinitum*, and the economist's procedural rationality in his ivory tower, is restored. Nash therefore extends the individually-based definition of "rationality", cherished by neo-classical economists, to situations of "strategic uncertainty", on the grounds that a game with many people can be reduced to its simple form (e.g. a game with two people) and also that the economic agent can compute anticipations *ad infinitum* in the same way than a "game theorist" does, without interrogating and communicating with the "Other". The economic agent is still an economist, not an econometrician anymore, but a game theorist!

## 2. Universality

This definition of rationality is supposedly universal, in the sense that all individuals think in the same way, and in the sense that such a definition of rationality leaves no room to the "obscurity" of cultural particular representations. Each player can see in the mind of the other one, which means that no cultural problem of understanding can happen. In fact, in Harsanyi (1967) the game between two players corresponds with a game of one player against "nature," which would choose with some objective probabilities to make a non-cooperative player, or a cooperative one, be the player. Game theory reduces strategic uncertainty to a situation where one individual plays against "Nature," explains why rationality is supposed to be universal, whereas, one could think that theoretically, economists will consider situations where the

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<sup>17</sup> According to Mirowski, Philip.( 2002. *op. cit.*), Von Neumann and Morgenstern were interested in changing the epistemic basis of neo-classical economics, and thus were particularly interested to conceive the economic agent as an observer of the world, but whose observation directly changes the state of the world. This emphasis on epistemic "reflexivity" that neo-classical economists were not ready to accept came from their back-ground in physics and relativity theory.

<sup>18</sup> Mirowski (2002, *op. cit.*) links this axiom with Nash's psychology, which may be true but which does not seem sufficient to understand why this axiom was also adopted by other authors to formalize games with incomplete information and "sequential" equilibriums.

<sup>19</sup> The levels of these anticipations are first, the "Me" agent's anticipations on the Other's *action* based on the matrix of their gains, supposed known; second, the "Me" agent's anticipations on the Other's *actions* induced from the Other's proper *anticipations* on the *action* chosen by the "Me" agent; third, the "Me" agent's anticipations on the Other's *action* induced from the Other's proper *anticipations* on the "Me" agent's *anticipations* on his *anticipations* of the "Me" agent's *action*; and so on *ad infinitum*.

<sup>20</sup> To see developments of these games with "sequential" equilibriums: Kreps, David and Robert Wilson. 1982. "Reputation and imperfect information." *Journal of Economic Theory*. Vol. 27.Pp. 253-269; Aumann, Robert. 1987. "Correlated Equilibrium as an Expression of Bayesian Rationality." *Econometrica*. Vol.55-1. Pp. 1-18 ; Dupuy, Jean-Pierre.1989. "Convention et Common Knowledge." *Revue économique*. March, vol.2. Pp. 361-400.

distribution of information is asymmetrical (when one player has more information than the other, etc) and when players do not think the same way. Mirowski (2002) well explained how game theorists purged from Von Neumann and Morgenstern, the vision of the game between two players from its initial conceptualisation, as a cryptographer decoding the signs of a vicious enemy (the involvement of Von Neumann in World War 2 “intelligence” services largely explain such a conception). This is a conception that actor-network and institutionalist theory will question.

Moreover, according to Dupuy (1989), this model of rationality leads to an increased “transparency” in the neo-classical construction of rationality: not only the actor envisions clearly the future states of the world, but he also envisions how the others envision these states of the world, and how they will reach an equilibrium. At least, in the neo-classical thought of the beginning of the century, and especially in Walras’ definition of market mechanisms, economic exchanges were to some extent obscure as they were supposed to occur by the external mediation of the famous “auctioneer,” whose work adds some “obscurity” in market mechanisms. On the contrary, Nash and other authors after him internalise the mediation of this auctioneer into their own definition of rationality, and equips the economic agent with the possibility to even envision how his own choice will meet “freely” the choice of the Other economic agent<sup>21</sup>. Game theorists introduce no external and “temporal” actor (the society, the State, the Walrasian “auctioneer,” etc.) who would mediate the two players, and who might impose “social” norms identified as “irrational” interests (game theorists only refer to a neutral actor, “Nature”, when they deal with situations of “incomplete information”).

### 3. *Sub-optimal equilibriums and the end of the one best way solution.*

Real market exchanges are perfectly transparent, and one would think that such a procedure of decision discovery would supposedly lead the best situation ever made. On the contrary, their definition of “rationality” leads to the creation of two “monsters” in economic theory: sub-optimal “equilibriums” and multiple equilibriums. The existence of sub-optimal equilibriums was first introduced by Nash (1954), and then formalized as the famous “prisoner’s dilemma<sup>22</sup>.” It reveals that “rationality”<sup>23</sup> does neither equate with “progress”, nor with economic wealth. The existence of sub-optimal (but stable, because rational) equilibriums does not so much threaten the analytical capacity to predict decisions from hypotheses on rationality: it just threatens the commonsensical idea among American economists<sup>24</sup> that the more dis-embedded is the market from social norms, the better economic exchange will function. But I will show that multiple equilibriums is much more threatening as it not only shows that some economic situations might not correspond to the

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<sup>21</sup> Dupuy, Jean-Pierre. 1989. art. cit.

<sup>22</sup> Illustrated for instance in a “dynamic” way by: Rosenthal, Robert. 1981. “Games of Perfect Information”, Predatory Pricing and the Chain-Store Paradox.” *Journal of Economic Theory*. Vol. 25. Pp. 92-100.

<sup>23</sup> And therefore “science”, as we said that each definition of rationality was in itself a vision of their science. This would lead to argue that this definition of rationality and the discovery of sub-optimal equilibrium is rather linked to the historical context, which it was supposed to formalize (as game theory started to be employed to formalize the nuclear strategy, in a context where the positivist assimilation of science and progress was less evident) than Nash’s psychology.

<sup>24</sup> See Fourcade-Gourinchas, Marion. Forthcoming. *The Trajectories of Economic Knowledge. Discipline and Profession in the United States, Great Britain and France*. Princeton, NJ: Princeton University Press.

one best way predicted by Walrasian theory of rationality, it also questions the rational foundations of economic action.

#### 4. *Rationality Reduced to a Peripheral Variable in Case of Multiple Equilibriums.*

Dupuy (1989) clearly shows that game theorists have cast a great doubt on the possibility that Rational Action Theory can have to predict a one best choice, and more radically, to predict any choice! The existence of multiple equilibriums (known in the literature in the example of the famous “sex war”<sup>25</sup>) is much more threatening for Rational Action Theory than the existence of sub-optimal stable equilibriums. Indeed, although they are sub-optimal, these equilibriums are deduced from the axiomatic of rationality. On the contrary, in case of multiple equilibriums, the economic situation is not deduced from the rationality of economic agents, but from their irrationality. Indeed, in cases of problems of coordination, when there exists two Nash-equilibriums in the diagonals of the matrix of gains, the individual cannot take a decision “rationally,” because in this case, he cannot the two alternative actions are “rational.” Such a situation is illustrated in the case of the famous “markets for lemons.”<sup>26</sup> It also, gives some “rational” foundations (Orléan 1986)<sup>27</sup> to the Keynesian intuition that economic agents use “conventional judgements” (that is “mimetic” or “conventionally” adopted behaviors to say in the sense of Keynes) in financial markets as there are have multiple equilibriums during financial panics, so that individuals face situations of “pure uncertainty,” on the one equilibrium that will be chosen among the possible ones. So agents conform to the gross observation of what the neighbour does<sup>28</sup>. Orléan (1986) shows that the existence of multiple equilibriums transforms economics into a science of “non-choice”! Therefore game theory cannot sustain economic situations on “rationality”.

So with game theory, Rational Action Theory has come to a dead end: it is a sort of aporetic reasoning, leading to show that purely rational agents can never decide what to do! Therefore, the only way that hardcore game theorists find to overpass this paradox is to introduce a slight dose of “irrationality” in their model so that their model can be predictive of some decision. But this solution works only for problems of cooperation. For instance, Aumann (1994) explains that one way to solve problems of cooperation, which leads to Nash and non-Pareto optimal equilibriums, is to make the hypothesis that agents are “rational” until a certain degree (he assumes that this degree is fixed at N), and then are “irrational” (meaning that the agent cannot anticipate on the other’s anticipations of his own anticipations, etc. more

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<sup>25</sup> Problems of “cooperation” are characterized by the existence of one Nash-equilibrium which is not “Pareto-optimal” (as in the case of the “prisoner’s dilemma”), and “problems of coordination” are characterized by the existence of multiple equilibriums, which may correspond or not to the same gains. To understand a problem of “coordination”, you can just imagine that you loose your partner in a super market and that you have two “traditional” meeting points, but you have only one chance to play the game. The gains are identical so there is no problems of cooperation. See Lewis, David. 1969. *Convention. A Philosophical Study*. Cambridge: Harvard University Press.

<sup>26</sup> Akerlof G. 1970. “The market for Lemons : Qualitative Uncertainty and the Market Mechanism.” *Quarterly Journal of Economics*, vol. 74.

<sup>27</sup> Orléan, André. 1986. “Mimétisme et anticipations rationnelles: une perspective keynésienne.” *Recherches économiques de Louvain*. Vol.1. (March). The fact that Orléan derives from Keynes his definition of a “convention” is important to know in order to understand the theoretical program of the French so-called “school of conventions.” See in particular: Orléan A. (ed.). 1994. *op. cit.*

<sup>28</sup> Keynes used the metaphor of the “contest of beauty” to characterize these situations, in which it becomes theoretically impossible to decide what to do, except by assuming that agents adopt a mimetic behavior. One wins the contest when guesses what the “crowd” will decide, that is to say, the *means* of all judgements. This leads experts to adopt “conventional judgements”. In Keynes, J. M. “The General Theory of Employment.” *Quarterly Journal of Economics*. Vol. 51. Pp.209-223.

than N-1 times)<sup>29</sup>. Then, the equilibrium will be Pareto-optimal as far the number of time that it can be repeated (which is noted M, with  $M > N$ ) is superior to N. In such a repeated game, this will lead to “reasonable” solutions (as opposed to “rational” ones), where the agent chooses to cooperate during M-N+1 repetitions of the game. But then, during the N other repetitions of the game, he chooses the non-cooperative solution because of the cognitive procedure of “backward induction” and the fact that after M-N repetitions, it is as if the matrix of gains is common knowledge. Aumann calls this hybrid form of “rationality” and “irrationality” a reasoning based upon the idea of “mutual knowledge” (as opposed to common knowledge), so he changes only rule defining the cognitive procedure of rationality. On the other side, to overpass problems of coordination, the only explanation of the fact that one equilibrium is attained and not another (and even that one equilibrium is attained!) involves something pertaining of a common “culture”, a common “world”. It is the solution that other authors have pushed.

##### 5. *Culture deduced from the inability of rationality to explain economic life*

From this new axiomatic of rationality, economists paradoxically come to face the existence of “culture.” Adding “culture” might be a preferable alternative to adding discipline and control, but the debate still exists among economists. In the cases of multiple equilibriums in situation of strategic uncertainty, economic decisions can only be deduced from something pertaining to “culture,” which Lewis called a “convention”<sup>30</sup>, as it is “tacit” and external to the game of infinite speculation. The so-called “conventionalist” school of economists have used game theory in an “aporetic” way to deduce the existence of conventions from the properties of economic rationality, as defined by game theorists. Hence, they sought foundations in Rational Action Theory for their “heterodox claims”.

To introduce some element of “culture” is how economists solve the problems introduced by the consideration of actions in strategic uncertainty, or what authors call the “strategic problem of trust”<sup>31</sup>. According to these authors, the “conventional” contents of regulations (rules, products, procedures, conventions, contracts) differ among historical contexts: in some contexts, rules are privileged over contracts, in some others, it is not the case, etc. However, the underlying hypothesis is that these cultural contents represent diverse answers to one same universal problem, which consists in finding a solution for economic decision when actors are faced with problems of coordination, assuming that actors are strategists and “rational”, in the sense of game theory. Williamson’s analysis of the rise of hierarchy and social and cultural conventions, starts for instance from a simple definition of rationality, using “satisfying utility functions” under strategic uncertainty. From that simple universal basis, Williamson predicts the rise of structural entities such as firms, State or abstract cultural “conventions”. Salais also develops the idea that economists must relate economic action with the adoption of “conventions,” which allow all the actors in firms and

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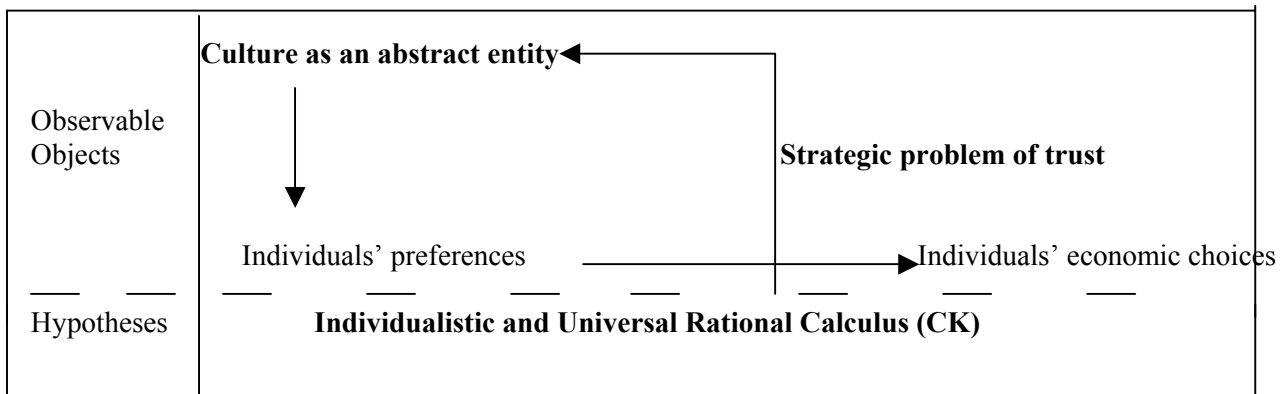
<sup>29</sup> Aumann, Robert. “L’irrationalité dans la théorie des jeux”. Orléan A. (ed.). 1994. *Analyse économique des conventions*. Paris, PUF.

<sup>30</sup> Lewis started to think about the implications of the theory of game of Von Neumann and Morgenstern for the field of the philosophy of language. He notes that whereas economists have focused on the problems of “cooperation,” philosophers of language should focus on “problems of coordination”. See in particular Lewis, David. 1969. *op. cit.* And for an earlier focus on problems of coordination, see also: Schelling, Thomas. 1960. *The Strategy of Conflict*. Cambridge: Harvard University Press.

<sup>31</sup> Williamson, Thomas. “Transaction Costs Economics and Organization Theory”, in Ronald Smelser and Richard Swedberg, (ed.). 1994. *The Handbook of Economic Sociology*, Princeton: Princeton Parperbacks and the Russel Sage Foundation; Coleman, Steven. 1994. “A rational choice perspective on Economic Sociology”, in Smelser Ronald and Richard Swedberg (ed.). *op. cit.*

markets (consumers, workers, managers, share-holders) to solve the problems of coordination that they face<sup>32</sup>. To Salais, it is crucial to see that a firm faces a situation of double strategic uncertainty: on the side of the labor force (will the workers “work”?) and on the demand side (will the consumers buy their product?). So in order to create a firm, entrepreneurs and workers must install a convention, which reduces strategic uncertainty. And to sell its product on a market, a firm must also agree on a convention with the consumer. to reduce this strategic uncertainty: through “specialization” (by getting an expertise, whether a special small and expert workforce, which creates in turn a monopole or by getting a special pool of consumers, for which the products are made) or through “consolidation” (aggregating many individual characteristics, whether on the labor side, creating huge firms with low skills and clearly defined characteristics, whether on the demand side, looking for big markets and creating products following the fashion of this huge pool of consumers)<sup>33</sup>. Therefore, he shows that economic situations are never dis-embedded from culture and conventions<sup>34</sup>. Contra sociologists and economists who claim that economic exchange is now dis-embedded from any form of regulation, this conventionalist perspective deduces the necessary existence of culture, from the fact that the extraction of the labor force is never total and always involves the perpetual agreement of the worker (and therefore, whether the existence of a totalitarian discipline, whether the existence of a convention ensuring trust).

Therefore, this second set of theories attempts to associate hypotheses on rational decision and the presence of something called “culture” in economic models. The relationship between culture and rationality can be described as follows:



**Figure 2: Deducing Culture from Rationality.**

<sup>32</sup> Salais, Robert. 1994. “Incertitude et interaction de travail: des produits aux conventions.” In Orléan André (ed.) *op. cit.* Pp. 371-401.

<sup>33</sup> Salais (1994) derives from Knight’s essay (1921) these two ways Salais to reduce uncertainty. This double nature of uncertainty faced by firms leads to four possible conventions represented in a two by two table classifying four possible conventions: starting with the “interpersonal convention”, characterized by the choice of a firm to specialize both in terms of labor skills and demands from consumers, and ending with the “industrial convention”, which consolidates the strategic uncertainty both on the demand side and on the side of the labor force. In this last case, the cultural convention is that the firm will respond only to the evolution of economic aggregates, paying no attention to “subjective” interests but only to “collectively defined” interests, and “quantitative” macro-economic variables.

<sup>34</sup> According to Salais, the fact that such elements as “interests”, “prices”, “numbers” become primary elements of our contemporary world, does not signal at all the dis-embeddedness of rationality from social norms, but the transition from an “inter-personal” convention to an “industrial convention.” See: Salais, Robert, Baverez, Nicolas and Benedicte Reynaud. 1996. *L’invention du chômage*. Paris : PUF.

The analytical division between the realm of “culture” and “rationality”, is however strengthened in this model, which demonstrates the everlasting but changing presence of “culture” in economic action by showing aporetically the illusionary basis of all serious theories of “rational” actions under the realistic conditions of strategic uncertainty I will now present articulations of culture and rationality, which do not reproduce this analytical division.

### ***CULTURE CONSTRUCTING RATIONALITY***

Contra the first and second articulations of rationality and culture, this third axiomatic explains “rationality” by “culture”. The main change is to explain how “cultural” factors account for the institutionalisation of different conceptions of rationality in economic life. “Culture” intervenes here as an independent variable explaining the rise of different types of representations of “labor”, “markets”, “exchange”, and other economic notions, including “rationality”. This leads to assume that there exists, not one definition of rationality, but different definitions of rationality, which are historically and culturally influenced. But the whole question is to know what are the mediations by which culture comes to have an explanatory role on rationality.

#### *1. Socio-cultural Constructions of Rationality.*

One of the main axioms of these theories of rationalization is that rationality is not individually constructed, but that, on the contrary, collective institutions and organizations support it. I will only cite one of the examples demonstrating the collective character of rationality in one of the most famous illustration of this axiom in Weber’s analysis. It shows that individualistic justifications of economic actions based on certain types of rationality are not deducible from the “rationality” of the individual, understood outside of his social and pragmatic context of action. The institutional basis of action therefore strongly defines economic rationality. Weber shows for instance that, for puritans, the practical orientation, or the “ethical orientation” shaped by the organizational design of “labor” (the puritan sects, considered as an apparatus of surveillance and power like in Foucault’s definition of a “moral architecture”<sup>35</sup>) and by macro-structures (class interests, cities, etc.) was stronger than the logical theoretical orientations that puritans had “internalised” as a set of maxims for action, (even at a time where these doctrines were the objects of central beliefs) to explain the development that capitalism has taken in contemporary Western societies. But more precisely, it is the interaction between one type of individual and one type of institutionalised context of action, which identifies a stable form of economic rationality. The diverse rational modes of reasoning cannot be attached to individuals of one society, abstractly defined (like “the workers”, “the intellectuals”), but they correspond to the types of rationality of individuals in particular contexts, and whose trajectories among institutions create diverse arrangements of meanings. For instance, in many respects, the puritan theoretical rationality, however very systematic, was loosely coupled with practical rationalities sustained by institutions and organizations, and these two different sources of meaning gave very different prescriptions. Weber shows that the transformation of religious “theoretical” beliefs due to the protestant reformation had no major direct effect on puritans’ practical rationality in economic

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<sup>35</sup> Foucault, M., 1975, *Surveiller et punir. Naissance de la prison*. Paris: Gallimard.

activities<sup>36</sup>, and puritans' practical rationality was shaped by the instrumental rationality of markets and professions, which Weber conceives as "meaningful institutions" to the extent that they are viewed by puritans through certain cultural meanings (puritans searched for proofs of their election in their most worldly daily activities and viewed the market as an evaluator of their chance to be pre-destined to paradise<sup>37</sup>), and also to the extent that the market also holds certain meanings depending on his organization (in the case of puritans, markets were formally rationalized institutions). Therefore, Weber defines economic rationality as the "interaction" or the elective affinity" between the rational meanings of actors involved in economic life, and the rational meanings held by its institutions. This understanding of rationality is widely shared among American "institutionalists."<sup>38</sup> For instance, DiMaggio, shows that when actors compete for the domination of markets<sup>39</sup>, they also compete to impose their definitions of economic rationality, which is shaped by their social location, the organizational design of their work, and the types of meanings held by other actors in the institutional context of their action (e.g. the profession sustaining formal rationality, as opposed to local contexts where meanings are shaped by local elites).

## 2. *Diverse Definitions of Rationality.*

Mapping out "types" of rationality is therefore an essential task for sociologists, as Weber says, when he recognizes that his ambition in economic-sociology was to establish a "typology" of historical modes of rationalization of economic life<sup>40</sup>. Weber mapped out diverse types of rationality, which were highly used by many literatures in economic sociology and political science<sup>41</sup>. He defines three pairs of opposed "rationalities": "theoretical" (e.g. sustained by intellectuals when they articulate concepts and observations) and "practical" (e.g. sustained by economic actors when they solve practical problems that they face in economic life); "formal" (e.g. sustained by a reference to abstract norms defining a public interest) and "material" (e.g. sustained by a reference to norms of a particular group); "axiological" (e.g. sustained by a reference to values which stand on their own) and

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<sup>36</sup> The two new dogmas, of the predestination of life, and of the "Deus Asconditus", if considered "theoretically", would logically lead to a kind of Epicureanism, mixing the devaluation of the word with an acceptance of life as it comes. Weber, Max. *L'Éthique protestante et l'esprit du capitalisme* [1905] followed by *Les Sectes protestantes et l'esprit du capitalisme* [1906], Paris, Presses Pocket ("Agora"), 1995.

<sup>37</sup> They did so because the market, a formal and mathematical device, provided them some objective measures of success, and this gave them a subjective but important signal of their election.

<sup>38</sup> Thomas, George, John Meyer, F. Ramirez and John Boli (ed.) 1987. *Institutional Structure. Constituting State, Society and the Individual*. Beverly Hills, CA: Sage; Meyer, John W. 1994. "Rationalized Environments." In Meyer, John and Richard Scott. *Institutional Environments and Organizations. Structural Complexity and individualism*. Thousands Oaks, CA: Sage.

<sup>39</sup> In the "field" of art museums, professionals' "formal" rationality is directly linked to their occupation in the field and their "practice" rather than to their theoretical beliefs: professionals try to find general procedures of efficiency and fairness in their work, which minimizes the significance of their conflicting theories of art, in order to impose their presence and their power on local elites, who subsidy museums and have a "material" rationality. DiMaggio, Paul. "Constructing an Organisation Field as a Professional Project. US Art Museums, 1920-1940." In Powell, Howard and Paul DiMaggio (ed.). *The New Institutionalism in Organizational Analysis*. Chicago: University of Chicago Press. 1991.

<sup>40</sup> Weber, Max. "Avant-Propos à la Sociologie des Religions." [1920] 1996. *op. cit.*

<sup>41</sup> Powell, Howard and Paul DiMaggio (ed.). *The New Institutionalism in Organizational Analysis*. Chicago: University of Chicago Press. 1991; Jepperson and Meyer in "The public order and Formal institutions", in Powell and Di Maggio (ed.), *The New Institutionalism in Organizational Analysis*. Chicago: University of Chicago Press. 1991.

“instrumental” (e.g. sustained on interests, or when sustained on values that are only a means to reach the specific interested goals). These types are situated on different levels, in which the “cultural” has a place of its own, along with the “social” and “psychological”<sup>42</sup> levels. Schluchter<sup>43</sup>, summarizes the different types of level of determinacy of economic rationality as follows:

<i>Level of analysis</i>	<i>Types of rationality</i>
Cultural orientations	Theoretical / Practical
Groups' membership	Formal / Material or Procedural / Substantive
Individual rationales or justifications	Instrumental / Axiological

**Figure 3: Types of Rationality.**

It is important to understand the way these ideal-types are built. These are not abstract definitions, first produced by social scientists, and then confronted to the particular cases analysed. Acknowledging the diversity of forms of rationality corresponds indeed with the a priori rejection of the assumption that social scientists create a-historical knowledge that pays no attention to actors' justifications and to the meanings held by the institutional contexts of their actions. Therefore these types of “rationality” do not refer to some universal deductible model against which actors' “good reasons” are confronted, and labelled as “irrational” when they do not conform to the definition of the model. Hence, applying some deductive models based on hypotheses on a unique form of “rationality”, would mix very different objects altogether in a particularly messy way. On the contrary, these types of rationality are inferred from the analysis of the “good reasons”<sup>44</sup> that actors gave in particular situations, assuming that actors are rational to follow the “good reasons” that they give.

To a certain extent, this leads to assume that all economic actions are “rational” to the eye of the social scientist. It is true if it means that actors' so-called “good reasons”, are not to be rejected as “irrational” on the pretext that they do not correspond to one theoretically constructed universal model of rationality. But it is not true if it means that economic actions labelled as “irrational” by actors are coded as rational by social scientists. This is well illustrated by Weber's approach, who chooses comparisons of contexts in which actors will define as “irrational” actions that others will define as “rational”. Weber shows for instance that although both a puritan of the seventeenth century and a Confucian mandarin of the same period conceive their economic actions as “rational”, their definitions of economic “rationality” are particularly opposed<sup>45</sup>. Weber bases his typology on radical oppositions between different conceptions of “rational”/“irrational” actions, and he started opposing types of rationality in a restricted comparatist approach,<sup>46</sup> (e.g. the comparison of Catholicism and

<sup>42</sup> In the sense of Weber, “psychological” does not refer to the idiosyncratic history of an individual, but to the type of justifications that an individual maintains in front of others as legitimate motivations of his actions. It is therefore also social, but Weber characterizes these justifications as psychological, because he recognizes their “effects” (rather than their “origins”) on the individual: they create incentives for action.

<sup>43</sup> Schluchter, Wolfgang. 1980. *Rationalismus der Weltbeherrschung. Studien zu Max Weber*, Frankfurt: Suhrkamp.

<sup>44</sup> Boudon, Raymond. 1986. *L'idéologie ou l'origine des idées reçues*. Paris : Fayard.

<sup>45</sup> Weber, Max. “Commentaires Intermédiaires dans l'Ethique Economique des Religions Mondiales.” [1913] 1996. *op. cit.*

<sup>46</sup> Passeron, Jean-Claude. 1992. “L'espace wébérien du raisonnement sociologique”. *Enquête. Cahiers du CERCOCOM* 7 (June): Pp. 3-23 ; Passeron Jean-Claude. “Introduction.” in Weber M. 1996. *Op. cit.* ;

Lutheranism on one side, and Puritanism vs. Calvinism on the other side, which leads to the definition of one of the *practical* rationalization of economic work as “beruf”) and then in a generalized comparatist approach after 1913 (date of publication of *The Economic Ethics of World-Wide Religions*), with the comparison of Western and Asian rationalizations of economic life<sup>47</sup>.

### 3. *There is no one best way.*

The fact that rationality is diverse and that institutions with same “functions” might hold different forms of rationality leads to question the idea of one-best-way. Although, in Weber’s essays on bureaucracy for instance, one might find some traces of an evolutionism, which would lead social scientists to state that formal type of rationality is better than the material one (etc.), his essays comparing for instance Chinese economy and Western economies temper this evolutionism. The problem of “trust” is solved from different perspectives with no priority given to one solution over the other: for instance, the development of a patrimonial form of capitalism in China, based on the conjuncture between the predatory form of civil service, and the constitution of large familial economic networks, helped develop a material rationality, which solved the problem of trust; whereas, the Western development, based on the sectarian movements and the empowerment of a strong civil administration in reaction with Church administration helped develop a formal type of rationality, which solved the problem of trust. Both solutions are different, but an individual would have to change his economic conception of rationality when changing of economic context, because they both solve the problem of trust.

### 2. *Rationality as a source of explanation of Economic Development: different answers.*

Therefore, this analysis has the merit to explicit the genesis of “cultural conventions” on which economic actions are based, whereas the the genesis of conventions was not tackled in the conventionalist theory. This “institutionalist” perspective is that types of “conventions” helping actors to coordinate their actions, are generated by the diverse arrangements between different type of rationality sustaining economic actions. Including rationality in culture, as if it was a convention represents a way to generalize the “conventionalism” presented in the last section. But does it mean that “rationality” recovers his central role in explaining economic development, as in the first axiomatic? Diverse answers are given to this question, corresponding to three theories: spiritualism, institutionalism, and functionalism.

(a) *Spiritualism.* Zelizer notices that opponents of the “Hostile World” assumption, tend to adopt what she calls “Nothing But” arguments.<sup>48</sup> It is this perspective that Boltanski

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<sup>47</sup> The choice of such a methodology, is correlated with the debate between Sombart and Weber, on the importance of opportunistic actions and “greed” reveals Weber’s ambition to extract sociology from economics, psychology and morality, whose common point is to base their definition of “capitalism” on some universal notions, like the “amoral unlimited accumulation of capital” or the general neo-classical law of maximization of interests. According to Weber, “greed” for unlimited possession of wealth is a clearly a universal character, as opportunistic behaviors are, but according to him, studies of economic phenomena should not focus on universal types of psychological or moral features, that one can find everywhere and at any time. (Weber, Max. *L’Éthique protestante et l’esprit du capitalisme* [1905] Paris, Presses Pocket (“Agora”), 1995).

<sup>48</sup>As Zelizer notices: “uncomfortable with such dualisms and eager to move forward single-principle accounts of social life, opponents of *Hostile Worlds* views have now and then countered with reductionist “Nothing But” arguments: the ostensibly separate world of intimate social relations, they argue is nothing but a special case of some general principle. “Nothing But” advocates divide among three principles: nothing but economic rationality, nothing but culture, and nothing but politics.”

and Chiappello (1999) adopt to understand the role of the new convention<sup>49</sup> defining the “rationality” of the “connexionist man.” This convention orients in a new way modern capitalism. In the case of contemporary French capitalism, capitalism has indeed attained a new step, by including the “artistic critique” in the apology of capitalism. According to the authors, the road of capitalism is indeed paved by the dead conventions of rationality, and its engine is the dialogic confrontation between one form of (or convention defining) the “spirit of capitalism” and one form of the spirit of resistance against capitalism. This causal chain is deduced from authors’ assumptions that economic actions are *always* rationally conform with the principles organizing these “cités”.<sup>50</sup> This mode of explanation represents therefore a new form of “dialectic spiritualism”<sup>51</sup>, and it is unrealistic to think that such an axiomatic of rationality is something else than an “experimental” construction or reduction, as it would entail that in one “society,” there is no room for “irrational” action (or action that does not conform with these principles of justice).

(b) *Meaningful Institutions and Institutionalism.* Against such a pure spiritualist expression, another articulation between culture and rationality is possible, which attributes a more peripheral role to “rationality” in the dynamic of “capitalism”. Weber developed it as he also reflected upon the notion of the “spirit of capitalism”, but while doing so, he shows that defining “culture” as an independent variable does not mean to embrace “spiritualist” conceptions of economic life<sup>52</sup>. The methodological experiment attempted by Weber is

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Zelizer, Viviana. September 2001. “Circuits within Capitalism”, paper presented at the conference on “The Economic Sociology of Capitalism”. Center for the Study of Economy and Society. Cornell University. P.2.

<sup>49</sup> Or “cité,” in reference to the Augustinian “city” of God, that is to say, a spiritual construction of principles of justice defining a public good. See: Boltanski, Luc and Laurent Thévenot. 1991. *De la justification: les économies de la grandeur*. Paris : Gallimard.

<sup>50</sup> Or that it “is the ideology, which justifies the involvement of those who are not capitalism’s first beneficiaries, and for whom, it is unrealistic to think that they would be purely forced to get involved into it.” Translated from the French from Boltanski, Luc and Eve Chiappello. 2001. “Comment interpréter les changements du capitalisme: réponses à quelques critiques.” *Sociologie du travail*. Vol. 43. Pp. 409-421. Boltanski and Chiappello (2001) deny that they are “spiritualist” by arguing what we referred to as their axiom 1 and 2 do not represent a spiritualist paradigm. This is true, but they misunderstand that it is in this axiom 3 that lies the “spiritualist” perspective, that Hatchuell criticizes.

<sup>51</sup> Gadrey, Jean. 2001. “Nouvel esprit du capitalisme et idéologie néo-libérale.” *Sociologie du travail*. Vol. 43. Pp. 389-402; Hatchuel, Armand. 2001. “ ‘Le nouvel esprit du capitalisme’: grandeurs et limites d’un spiritualisme dialectique.” *Sociologie du travail*. Vol. 43. Pp. 402-409. The adoption of such a spiritualism must however be reintroduced in the broad purpose of the book, as Hatchuell, Armand did (2001. art. cit.): he reminds that the purpose of these authors is to identify a new “cité” governing the exchange and labor relations in France from 1965 to 1995, and then to build a meta-theoretical argument balancing this new dominant “cité”, against which previous criticisms referring to other “cités” (of inspiration for instance) do not apply. It seems that such a meta-theoretical and political project (breaking with the assertion that conflicts are locally fought), needs to be sustained by such a spiritualist vision to be executed.

<sup>52</sup> Some interpreters, following Tenbrück think that Weber’s work has two different directions. The early Weber would explain economic development by the transformation of economic structures, and the second Weber would explain economic development by religious variables. The first Weber would be Marxist in his orientation, and the second one anti-Marxist. Such a “spiritualist” interpretation of the “second” Weber had already been presented after the publication of *The protestant Ethic and the Spirit of capitalism* by Rachfall in 1905, and Weber sharply criticized it. Therefore authors like Passeron and Grossein nowadays criticize Tenbrück’s argument based on Weber’s answer to Rachfall in his “Anti-critics” (1910 [1995]). See: Weber, Max. [1910] 1996. “Anti-critiques.” *Sociologie des religions*, Paris : Editions Gallimard, collection Sciences Humaines; Passeron, Jean-Claude. 1992. “L’espace wébérien

opposite to the one of Boltanski and Chiapello: rather than radicalising purposely the conventionalist determination of economic action, Weber limits, as far as he can, the scope by which a cultural type of rationality can have an effect on the development of capitalism. In his times, the spiritualist thesis that the “spirit of capitalism”, identified grossly with the protestant reform, was at the origins of capitalism, was well known, so the innovation that Weber brings, is to limit to the maximum this idea. By limiting the centrality of rationality the more he can, Weber produces an axiomatic of rationality, that prolongs Marxism, but purifies it from any trace of “functionalism”<sup>53</sup>. Weber explains that neither the cultural aspect in the “spirit of capitalism” (e.g. the ideology of profession-vocation) does “explain” the dynamic of capitalism, nor does the whole “spirit of capitalism.” Neither Puritanism, nor the “rationalization” of economic life that characterize periods of transition “explain” the general economic dynamic. It is only to the extent that cultural, social and psychological types of rationality entertain an “elective affinity” that they can lead to common historical developments, but in any case social structures (the “bourgeoisie”, “cities”<sup>54</sup>, “markets,” “bureaucracies”) and technical inventions have also an essential role. Moreover, in this complex understanding of causality, the “rationalizations” of economic life (See in appendix 1) for a representation of different rationalizations in economic history) might have a role but not the primary one, and they can have different effects depending upon the institutions and actors who mobilize them. They can have also un-expected and non-linear consequences. Indeed, Weber shows that in economic development can be paradoxical : for instance, the theoretical economic rationalization that occurred with Confucian “reformation” (which emphasized opportunistic and “greedy” behaviours) was oriented towards high systematisation at the theoretical level of economic maxims with similar content as the puritans’ books of morals. So confucian precepts were incorporated in a new academic doxa, which served as a basis to recruit mandarins through the educational system, and which was supposed to develop a bureaucracy supporting the development of a formal rationality. But to secure the formality of rationality, mandarins were assigned to rule Chinese provinces in which they had no family after passing the very long exams of the educational system, so that no conflicts of interests between ethnic or familial groups and the State could occur. Paradoxically, such an organizational design created in practice incentives for predatory management, as untied by the bounds of reputation and family, mandarins’ main concerns were to accumulate as much wealth by any means available without any regard for formal procedures and spirit of long term prevision. Mandarins never applied the theories they learned and collected taxes many years in advance. So this example illustrates the way cultural orientations matter in different economic rationalizations. But it also shows one ambiguity that still exists in this presentation of Weber’s theory: on one side, Weber shows whether one form of rationalization is more systematized in theory or in practice, and whether the theoretical rationalization has more predictive significance for the development of

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du raisonnement sociologique”. *Enquête. Cahiers du CERCOM* 7 (June): Pp. 3-23 ; Passeron Jean-Claude. “Introduction.” in Weber M. 1996. *Op. cit.* ; Grossein, Jean-Pierre. 1996. “Introduction.” In Weber, Max. 1996. *op. cit.* ; Boudon R. 1998. “L’Éthique protestante” de Max Weber : le bilan d'une discussion" in Boudon R., *Études sur les sociologues classiques*, Paris, P.U.F. ; Tënbrück, Friedrich. 1998. *Das Werk Max Webers. Gesammelte Aufsätze zu Max Weber*. Tübingen: J. C. B. Mohr.

<sup>53</sup> Weber writes indeed that, “not ideas, but material and ideal interests, directly govern men’s conduct. Yet very frequently the world images that have been created by ideas have, like switchmen, determined the tracks along which action has been pushed by the dynamic of interests”. (“Introduction à l’Éthique Economique des Religions Mondiales.”, in Max Weber [1913] 1996).

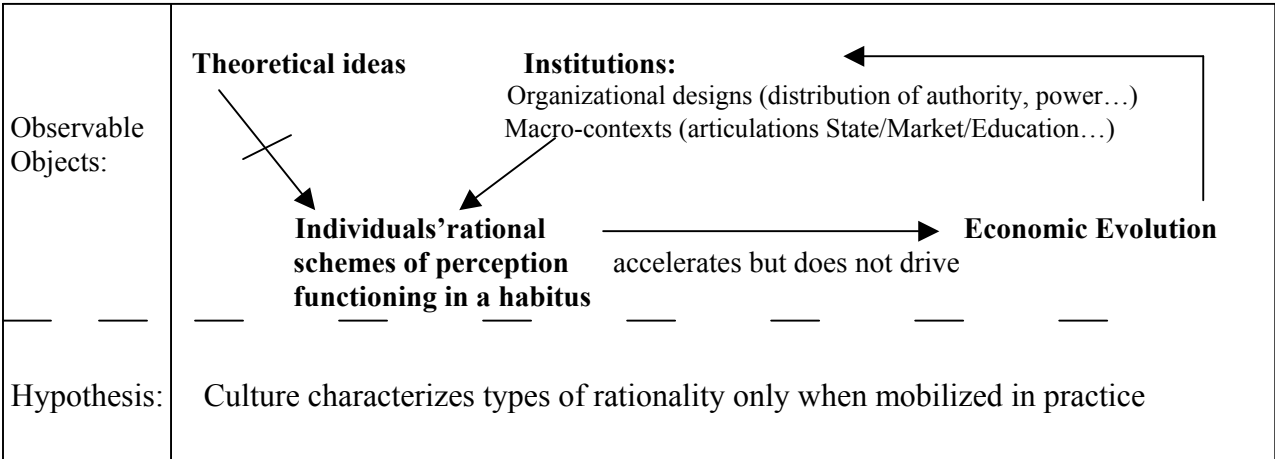
<sup>54</sup> See in particular his analysis of the co-development of the bourgeoisie and the political and social organization of the “city”: in Weber, Max. *La ville*. 1982 [1921], translated by Philip Fritsch. Paris : Aubier-Montaigne.

capitalism than the practical one; and on the other side, Weber always explains the degree of systematisation of both cultural orientations by the institutional contexts, and always shows that in the end, it is always through the mediation of practice that theories might come to have some significance on the development of capitalism.

(c) *Functionalism*: The fact that present-day Weberian analyses of economic rationality are oriented towards the study of “practice”, is well illustrated by Bourdieu<sup>55</sup>, and this tends to orient his “institutionalism” towards a kind of functionalism, as meanings will be reduced to illusory constructions whose “real” goal is to lead economic agents to pursue their functional work in society. There is such an ambiguity in Bourdieu’s theory, when he analyses for instance different rationalizations of economic action in colonial French society. These different rationalizations, incorporated in different “habitus,” explain the problems that colonial workers faced when participating in the “new” imperialist economy, and their subsequent resistance. The “pre-capitalist” rationalization, where material and axiological rationality are significant, and the “modern capitalist” rationalization, where formal and instrumental rationality are the most significant, clashed in this economy. This argument identifies the “practical” basis of dynamics of resistance in colonial society, whereas the literature had focused mainly on the purely political ones, framing the resistance in terms of “fight for independence”. But, then Bourdieu relates all the series of meanings attached to the axiological form of rationality (logics of “honor”, of “gift”...) as functional and necessary elements of masculine domination in traditional societies. This has two defaults: it creates too strong a cultural necessity (does masculine domination needs this meanings to occur); and it creates the impression that when these meanings are absent (in our society), masculine domination is absent.

5. *The link between culture and rationality.*

I already discussed extensively the link between rationality and culture in this axiomatic, as the articulation between the two represents its main feature. I will only say, that in the “institutionalist” perspective, the relation between culture and rationality can be formalized as follows:



**Figure 4: Culture in Practice and the Construction of Rationality**

<sup>55</sup> Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press; and Bourdieu, Pierre. 1998. “The Economy of Symbolic Goods”, in *Practical Reason. On the Theory of Action*. Cambridge: Polity Press. Pp.92-123.

The extent to which these approaches are “cultural” consists in assuming that people pursue their interests, but before actors involve themselves in the pursuit of their interests, they require an order of cultural symbols that establishes for them a relation to the world, that is to say, a socio-cultural construction of rationality. The difference with theories presented in the first section is therefore striking. Whereas they assumed that rationality is dis-embedded from institutions and culture, the conclusion is here the opposite: any form of economic rationality is embedded in networks<sup>56</sup>, institutions, and culture, and is historically constituted. But this does not mean, except in the two opposite extremes forms of this “culturalism” (that is to say, in the “spiritualist” and the “functionalist” approaches of rationality) that all actions are “rational.” Indeed, this would assume that actors do not draw symbolic boundaries between “rational” and “irrational” actions, which they do. So institutionalist authors state that rationality and irrationality are culturally constructed, and that they both exist in different ways.

### ***CLOSING THE CIRCLE: EXPLAINING NEO-CLASSICAL CONSTRUCTION OF RATIONALITY BY CULTURE.***

I will present a last approach in this section, which can be viewed as a continuation of the institutionalist paradigm, but I will present it in a separate section, as at the same time, it dialogues in a different way with neo-classical and game theorists. Institutionalists largely disconfirm the neo-classical construction of rationality. Their dialogue with neo-classical and game theories is therefore very critical : neo-institutionalist theorists have raised central concerns against neo-classical theory, by showing that economic rationality is not a universal calculative capacity of processing information, but that, on the contrary, it is also regulated by a complex mix of values, manifested at the level of the interaction between institutionalised contexts of action and individuals’ motivations. The actor-network construction of rationality that I will present now gives a different perspective, as it is based on studies of the ways that neo-classical and game theorists “explicate” their constructions of rationality in practice. It is not a coincidence that instead of criticizing neo-classical theorists at the level of an abstract confrontation of theories, authors producing actor-network theory choose to “sociologize” these theories as authors were largely specialized in science studies<sup>57</sup>. But while doing so, actor-network theorists also distinguish themselves from institutionalists by saying that Weberian ideal-types are too imprecise to describe in detail the boundaries between “rationality” and “irrationality” that economic actors draw in practice. They particularly criticize the homogeneity that neo-institutionalists attribute to the diverse forms of the “instrumental” type of rationality.

#### *1. Diverse Constructions of Instrumental Rationality.*

Criticizing the idea that rationality is universally defined might not seem a criticism of neo-institutionalist approaches, which as I said, are based on this idea. Showing the existence of diverse forms of “instrumental rationality” is merely an exploration of the typology of

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<sup>56</sup> Granoveter, Michel. 1985. “Economic Action and Social Structure: The Problem of Embeddedness.” *American Journal of Sociology*, Vol. 91, No. 3. (Nov.) pp. 481-510.

<sup>57</sup> See for instance : MacKenzie, D. (2001). *Mechanizing Proof. Computing, Risk, and Trust*. Cambridge, Massachusetts, MIT Press; MacKenzie, D. (2001). "Physics and Finance: S-Terms and Modern Finance as a Topic for Science Studies." *Science, Technology, & Human Values* 26(2): 115-144.

forms of rationality from within the neo-institutionalist paradigm. But that is right that neo-institutionalist studies have privileged an approach, which criticized the neo-classical paradigm by showing the significance of references to norms in rational actions, and therefore, some might have tended to equate instrumental rationality with the universalistic definition of neo-classical economists, who describe it as a mathematical calculus based on the gathering of information in a matrix of gains, and on an algorithm of maximization of individual expected utility of these gains. Callon raises for instance concerns against this view of instrumental “calculation,” which economists define in a too narrow way as a purely individual and universal algorithm<sup>58</sup>. He proposes a broader definition of an instrumental “calculation” based on a more phenomenological basis, which pays attention to the diversity of potential forms of calculation. To Callon, calculation is indeed composed of three steps, which all can have diverse manifestations: first, there are different ways by which the attention of the potential buyer is “solicited” by objects (whether material or immaterial) and by which therefore, the object gets a thing-like character as it is displayed in a single space of commensuration with other objects (what Callon calls the “procedures of “detachment”); second, there are diverse “algorithmic” procedures of comparison between these thing-like objects; third, there are diverse ways to extract the identified preferred object in the word of the buyer, what Callon calls the “procedure of attachment”. Each of the steps can be diverse, whereas, neo-classical and game theorists suppose that they are only one<sup>59</sup>. For instance, the procedures of detachment are very diverse, whether the extraction of a “thing-like” character from an object will happen on a shopping centre<sup>60</sup> or whether it will happen on a financial market in Wall Street<sup>61</sup>: the spaces of commensurability are diverse. Also the algorithmic procedures of detachment are also diverse: they even are compared and sold on a market! Muniesa (2003) shows for instance that there exists a market of algorithmic procedures of “price discovery” on different stock exchange,<sup>62</sup> which correspond to different rules of

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<sup>58</sup> Callon, Michel. 1998. “Introduction: the Embeddedness of Economic Markets in Economics”, in Michel Callon (ed.). *The Laws of the Market*. Oxford: Blackwell Publishers/The Sociological Review; Callon Michel, Meadel C. and V. Rabeharisa. 2000. “L’économie des qualities.” *Politix*. 13: 211-239 ; Callon, M. and F. Muniesa (2002). “Economic Markets as Calculative and Calculated Collective Devices.” New York Conference on Social Studies of Finance, Columbia University and the Social Science Research Council, May 3-4.

<sup>59</sup> In the case of neo-classical theory, first, the procedure of detachment consists in reducing choices to lotteries with gains and probabilities; second, the algorithmic procedure of comparison consists in a calculus of maximization of expected utility; third, the procedure of attachment consists in an exchange at the price fixed by the meeting of aggregated supply and demand curves on a market. In game theory, first, the detachment consists in reducing choices to a matrix of gains; second, the algorithm consists in choosing the best individual gain by a procedure of backward induction from an infinite temporal horizon; the attachment is automatic.

<sup>60</sup> Cochoy, F. (1998). Another Discipline for the Market Economy: Marketing as a Performative Knowledge and Know-how for Capitalism. *The Laws of the Markets*. M. Callon. Oxford, Blackwell: 194-221. Cochoy, F. (2002). *Une sociologie du packaging ou l’âne de Buridan face au marché*. Paris, PUF.

<sup>61</sup> Preda, A. (2002). "Financial Knowledge, Documents, and The Structure of Financial Activities." *Journal of Contemporary Ethnography* 31(2): 207-239; Preda, A. “The History of the Ticker.” New York Conference on Social Studies of Finance, Columbia University and the Social Science Research Council, May 3-4.

<sup>62</sup> Muniesa. *Le marché comme algorithme*. Thèse de socio-économie. Paris : Laboratoire du CSI. He analyses the sell of the Canadian computerized algorithm matching buyers and sellers on the Toronto stock exchange to the Paris stock exchange. This algorithm is constructed under the principle of an order-driven market, where orders are transmitted to an electronic order book, where they are stored and queued and then matched by a double-auction algorithm. Other algorithms were possible: for

priority (matching equivalent prices, ordering orders according to time) between different bets. As Callon (2003) writes : “instead of two aggregated curves crossing each other, we have a variety of algorithmic configurations relying on material, technical and organizational devices and on embodied competencies, all of which produce widely diverse arrangements”<sup>63</sup>

## 2. *Collective hybrid and Rational Socio-technical Actors*

A stronger criticism that actor-network theory addresses against neo-classical theory and game theory is that these diverse constructions of instrumental rationality are not individually constructed. It is indeed impossible to think that economic agents can perform complicated “calculus” or even simple ones, without the use of technical equipment. As Callon states, the centres of calculation are not in the human mind: they are distributed among humans and non-humans. The attention given to the instruments of “instrumental” rationality (!) was already praised by Weber who, as Callon recalls, related the rise of instrumental rationality in Western capitalism to the introduction of the double entry bookkeeping. Authors show therefore that even neo-classical rationality is embedded in a socio-technical construction when it is used in practice. Garcia<sup>64</sup> gives a great description of the socio-technical requisites for “calculating” like neo-classical rational agents are supposed to calculate and to exchange: Garcia describes all the technical arrangements that sellers of strawberries had to imagine and materialize so that they could sell their products using a neo-classical blind auction protocol to determine the price of their products: they had for instance to build different levels in one room, so that they can be hidden from each other in order to protect anonymity, etc. Therefore, this study shows that the aggregation of supply and demand curves is not mediated by a benevolent individual (the Walrasian auctioneer) but is rather constructed by the interaction of the meanings attributed by actors to the market (meanings involving axiological types of rationality, with the value attributed to anonymity, etc.) and the institutionalised contexts of exchange. Garcia shows that the neo-classical construction of rationality is distributed among human and non-human actors. Different authors show that the type of rationality that previous economic theories attribute to the capacities of the individual is indeed the product of the interactions between diverse kinds of sociological and technical actors. Biernacki (2000) gives another great illustration of the collective construction of calculation in the case of calculation of the value of labor in Great Britain and Germany<sup>65</sup>. It is not the individual but the whole metrological system of calculation, embedded in instruments of measurement of economic labor, in the socio-technical apparatus of control and surveillance of labor power (e.g. the architecture of fabrics, through the schedule of work, and the types of punishment in case of bad execution or lateness), which generates the algorithmic formulation of the value of labor. Biernacki shows how these socio-technical configurations form two different systems of calculation: in Germany the algorithmic calculation is based on the belief that workers sell their disposition to act under the authority of a manager in the production process, that is to say their concrete labor force, or “labor power”; and in Britain, it defines the transferred quantity labor as if labor was embodied in finished products. So for instance, Biernacki shows that fabrics in England and Germany had very different architecture corresponding to different qualifications of “labor”: in England,

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instance, the quote-driven market, where it is the market maker who, by trial and error links supply and demand. For a description a of diverse microstructures of markets, see: Mirowski, P. and K. Somefun (1998). "Markets as Evolving Computational Entities." *Journal of Evolutionary Economics* 8(4): 329-356.

<sup>63</sup> Callon. 2002. P18.

<sup>64</sup> Garcia, M.-F. (1986). "La construction sociale d'un marché parfait : le marché au cadran de Fontaines-en-Sologne." *Actes de la recherche en sciences sociales*(65): 2-13.

<sup>65</sup> Biernacki, Richard. 2000. *The Fabrication of Labor*. Berkeley, CA: Berkeley University Press.

fabrics were like market places, with one point where demand and supply could meet, whereas in Germany, they were like a chain of production, with many functional cells corresponding to different steps of production. Identically, the fine for damages in Britain compensated the owner for market losses suffered upon disposing of the workers' labor product, whereas in Germany, the fine disciplined the workers for the careless expenditure of their labor power<sup>66</sup>.

Authors from actor-network theory have also emphasised the extent to which constructions of rationality were embedded in power relations (or in the vocabulary of its authors, they have emphasized "asymmetries" between capacities of calculus). Callon (2002) insists on the "asymmetries" between calculative capacities between different economic agents: a shopping centre collects all information on his clients, "manipulates" the information statistically in order to generate profiles so that the store can optimise the architecture of the shelves, and he can even sell the information created to designers and packagers. Whereas, neo-classical and game theorists have assumed that calculative capacities were all distributed equally among economic agents, authors show that they are unequally distributed, and that economic agents try to "subject," in the foucauldian sense, each of the steps composing calculation (detachment, algorithmic manipulation, attachment) to their control. Cochoy (1998) shows for instance how designers and sellers pay increasing attention in shopping centres to the consumption habits (and gather the information on consumers' behaviors, manipulate it in order to arrive to optimal prescriptions of presentation) and infer from them some organizational design exposing the different goods in a privileged way so that it would optimise their control on buyers' procedures of "detachment" of objects. By organizing the shelves and the presentation of labels of products, they discipline the buyer's world and clearly "subjected" it to the action of designers and managers of shops. However, Callon insists on the fact that this form of control is never "totalitarian" (at least in present day shopping centres!), to the extent that individual buyers can also mobilize the resources of their word (using cell phone to ask what brand of chocolate their family prefers, for instance) to "calculate," and therefore not completely "subjected" to the frames that some economic agents try to impose. This procedure can also lead to what I could call the "accumulation of calculative capital," to the extent that this information is the object of an appropriation, and of storage and even of possible exchange by one side of the interaction (between the buyer and the seller). This accumulation of calculative capital consists in an extraction of value from economic interactions, as it is done in an asymmetrical way.

### 3. *There is no one best way.*

Too often, normative debates oppose on one side, tenants of values and culture, and tenants of instrumental rationality and markets. This opposition only strengthens the dichotomy between culture and rationality as I said in the first section. Callon and Muniesa (2003) take an opposite position, stating that the real political issue is to discuss about the type of "calculation" that one society is willing to adopt, and that fixing the type of calculation cannot be reduced to a one-best-way determined authoritatively by experts. The example of Paris stock exchange, analysed by Muniesa (2003) shows that procedures of calculation are

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<sup>66</sup> DeGaudemar, showed that in the case of France, managerial theories transformed firms into some kinds of "experimental laboratories", conducting experiments on the definition of work, the manipulation of principles of equivalence between work and wages, through the organization of socio-technical instruments (with a mechanized chain, and the decomposition of work into elementary behavioural particles), gender relations (as women entered fabrics) and on new appropriation of the public space (all the tracts of the pre-war trade-unions were expelled and as the material culture of resistance as firms were displaced from the war front). See : DeGaudemar, Jean-Paul, *L'ordre et la production: naissance et formes de la discipline d'usine*, Dunod, Paris, 1982

not determined in a one best way manner, but correspond to the local arrangements that people on the specific market, with the specific values and interests they hold, have negotiated so that the socio-technical machine works. Muniesa analyses the computerization of Paris stock exchange, where the implementation of a Walrasian-like market is substituted to the open out-cry market of sellers, which was strongly embedded in traditions of solidarity and networks<sup>67</sup>. From the exterior point of view of a neo-classical economist, such a transition might appear as the best economic development as it leads to the adoption of a Walrasian market! But Muniesa shows how the determination of the calculative algorithm chosen in Paris stock exchange to determine the “discovery of prices,” has been extracted from many possible compromises between a mix of humans (brokers, sellers on the out-cry market, banks, professional associations, the State) and non-humans (computers in the trading room, programs of algorithm), whose actions have emerged in a somehow contingent way, and have corresponded at the same time to the relations of power (the implementation of the machine was reducing most of the activity and value of sellers on the open outcry shop floor for instance) and to the references to general principles of justice (for instance, the respect of fair competition<sup>68</sup>). Therefore, this example shows that the definition of this precise “instrumental rationality,” which is historically constructed by the particular configuration given to this form of market in this particular period in the history of Paris stock exchange, is linked with formal and material forms of rationality, that are discussable by actors. This understanding of economic rationality is therefore multi-dimensional, like in neo-institutionalist theory.

#### 4. *A Central Role for Rationality in Economic Causality.*

One of the limits of these analyses is that they do not situate their analysis in the broader scope of economic development. Therefore, their interest in calculation is not linked to the broader implications of the theme. One of the counter-example is however Biernacki, who gives a clear definition of the significance of his analysis of calculative practices for the broader economic development. Biernacki justifies his choice of Germany and the Great Britain, as they both drew upon different fictions, but as they came from the same structural initials conditions<sup>69</sup>. Therefore, this example best illustrates the weigh of calculative practices on economic development. According to Biernacki, calculative practices of labor were not only framed by cultural schemas held by socio-technical actors, they also formed a “cultural system”, as “labor” became in both societies the central concept by which one could “understand” the functioning of the whole capitalist system, and therefore resist against it:

In capitalist society, labor became both a form of understanding and the integrative principle that regulates social actions in society as a whole because only there does it bridge lived experience and the invisible functioning of a system. [...] The

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<sup>67</sup> Muniesa, F. (2000). "Un robot walrasien. Cotation électronique et justesse de la découverte des prix." *Politix* 13(52): 121-154.

<sup>68</sup> This principle is translated in the computation system with OTC (Over the Counter System), which allows everyone to access the disclosed identity of potential counter-parts for orders.

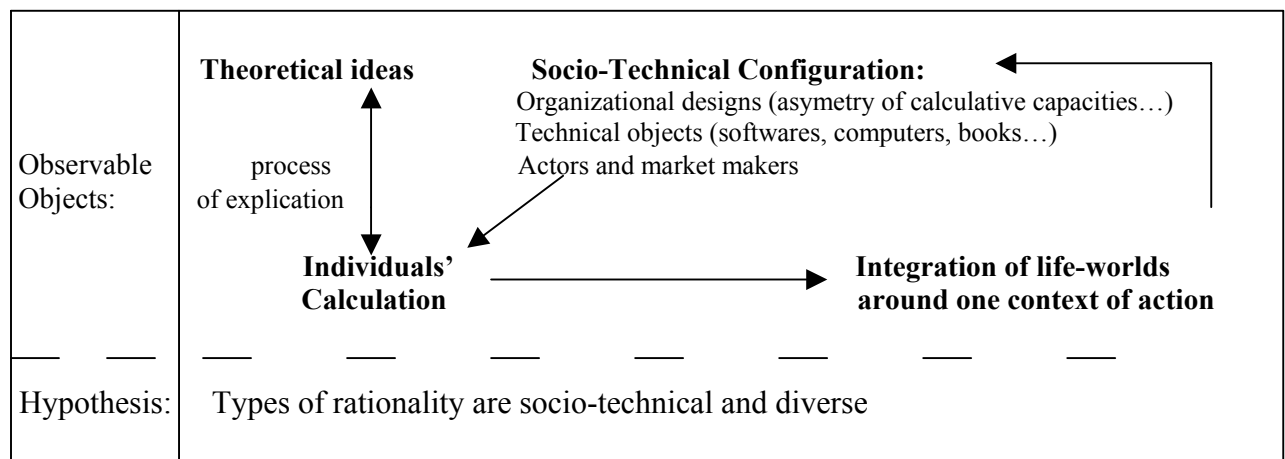
<sup>69</sup> For instance, Biernacki (2000) shows that England and Germany had initially the same pay systems for labor conditions (mill owners in both Germany and Britain preferred to pay weavers by the piece), from which further diverging developments cannot be deduced if one does not consider the type of culturally constructed rationality that happened to be realized in both countries at two levels: the one of practice and the one of theory. Mill owners maintained this “pay-by-piece” method of reward in Germany as it gave weavers an incentive to work without huge supervision and thereby minimized the costs of superintendence, which can seem to be a rational calculus of maximization of transaction costs from the neo-classical perspective. However if the payment by shot was predominant (not universal) in Germany, it was unknown in Britain.

category of labor did not function as a pivotal concept because it expressed the detached logic of the capitalist system, or, from the other side, because it revealed the supremacy of culture in the producers' negotiation of a meaningful order; instead, it bridged these two realms of a market-integrated social structure and the experienced world.” (Biernacki, p.207)

In the last part of his book, Biernacki indeed shows that social movements indeed rest their claims for social justice based on the prevalent definitions of labor that were constructed in their society. Therefore, the way “rationality” is conceived is essential in explaining economic development, and also theoretical developments of “economics” as a “political science” (influencing the figure of Smith in Great Britain, and Marx in Germany).

5. *Culture Theoretical Assumptions analysed in practice.*

These theories pay therefore much more attention to the impact of theoretical ideas developed in economics than the institutionalist school. They therefore entertain an original form of dialogue with universalistic theories: Muniesa and Garcia with neo-classical economics as they study the socio-technical construction of a Walrasian market; Guala with game theory, as he studies the mobilization of game theorists in the experimental construction of markets<sup>70</sup>. They all show that theories of calculation are “explicated” in the process of The relationship between culture and rationality that I presented in these theories can be therefore formalized as follows:



**Figure 4: Culture in Practice and the Construction of Rationality**

**CONCLUSION**

I started the analysis of the axiomatic of rationality developed in neo-classical economics by showing that it was based on an initial opposition between culture and rationality, and then I showed that, in the process of becoming more plausible, this axiomatic reached an “apory,” which was only over passed by including a missing element: culture. Then, I presented analyses of socio-cultural constructions of rationality, differentiating three

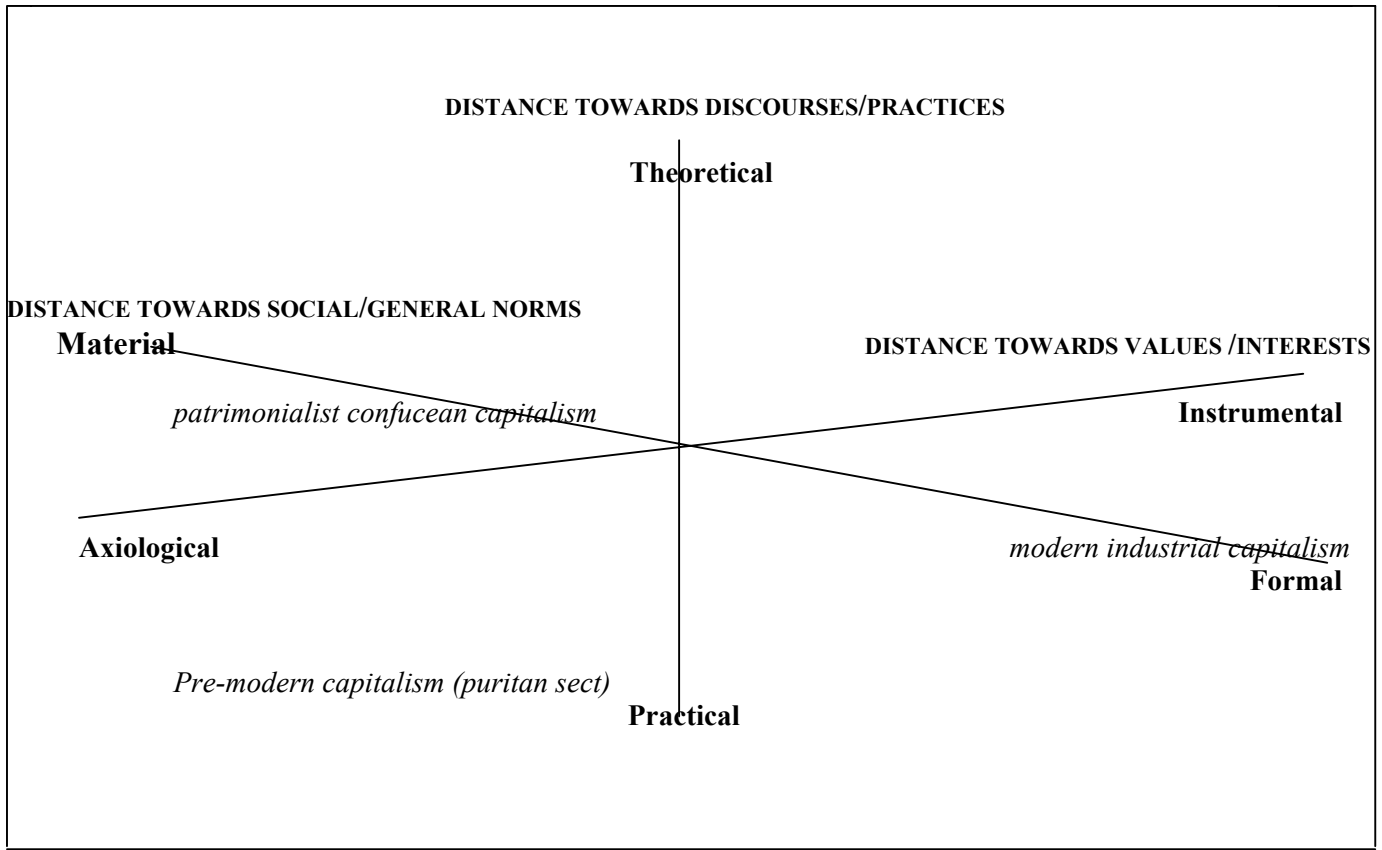
<sup>70</sup> Guala, F. (2001). "Building Economic Machines: the FCC Auctions." *Studies in History and Philosophy of Science* 32(3): 453-477. Guala, F. (2002). "Models, Simulations, and Experiments." In *Model-Based Reasoning: Science, Technology, Values*. L. Magnani and N. Nersessian. New York, Kluwer.

approaches according to the status of rationality in the causal mechanism: spiritualism, institutionalism and functionalism. In the process of finishing the circle traced, I exposed articulations between economic theory and cultural forms of rationality. My analysis has started with exposing rationality in economic theory. It has ended by analysing whether such a conception of rationality can be conceived as cultural and in what sense. On the overall, the four conceptions of rationality can be summed up as follows:

<b>Axiomatic</b>  <b>Properties of Rationality</b>	<b>1</b> <b>Neo-classicism</b>	<b>2</b> <b>Game theory</b> <b>Conventionalism</b>	<b>3</b>			<b>4</b> <b>Phenomenology</b> <b>Action-network theory</b>
			<b>Spiritualism</b>	<b>Institutionalism</b>	<b>Practice theory</b>	
<b>Nature of Rationality</b>	Universal	Universal	Diverse			Diverse
<b>Link with Individual/Society</b>	Individualistic: abstraction from society	Individualistic: internalisation of society in the individual choice	Collective : hybrids of individuals and institutions			Collective : hybrids of individuals and techniques
<b>Link with justice</b>	Based on a principle of general justice	Antithetical with principles of general justice	Based on a principle of general justice	Multi-levelled basis of rationality	Anti- thetical	Multi-levelled basis of rationality
<b>Theoretical causal status</b>	Central	Reduced to zero	Central	Peri- Pheral and Non-linear	Peri- pheral / reduced to zero	Central
<b>Link with culture</b>	Rationality opposed to culture	Culture deduced from the inability of rationality to explain economic life	Rationality culturally constructed			Rationality culturally constructed
<b>Authors</b>	Walras (XX) Von Neumann (47) Nash (54) Stigler (61)	Aumann (94) Orléan (94) Salais (96)	Boltanski (1999)	Weber (1905) Di Maggio (1994) Portes (19XX)	Bourdieu (1984)	Biernacki (2000) Callon (2000) Muniesa (2003) Guala (2002)

**Table 5: The Four Axiomatics of Rationality Compared.**

**APPENDIX 1: Typology of Historical Configurations of Economic Rationality\***



**Figure 4:**

\*The first axis is separating discourses and practices; the second one the reference to norms of social groups and to universal formal procedures; the third one is distributing different levels of distance to these norms (whether the norm be absolute or relative to the search of certain ends). Along these three different axes, Weber classifies different historical definitions of “rational actions” as shown on the graph.