Introduction: the embeddedness of economic markets in economics

Michel Callon

Even as the market seems triumphant everywhere and its laws progressively and ineluctably impose themselves worldwide, we cannot fail to be struck by the lasting topicality of the following well-known quotation from D. North:

'It is a peculiar fact that the literature on economics . . . contains so little discussion of the central institution that underlies neo-classical economics—the market' (North, 1977).[1]

How can this surprising shortcoming be explained? How can this self-proclaimed failure of economic theory be accounted for? By distinguishing the thing from the concept which refers to it, the marketplace from the market, the English language suggests a possible answer. While the market denotes the abstract mechanisms whereby supply and demand confront each other and adjust themselves in search of a compromise, the marketplace is far closer to ordinary experience and refers to the place in which exchange occurs. This distinction is, moreover, merely a particular case of a more general opposition, which the English language, once again, has the merit of conveying accurately: that between economics and economy, between theoretical and practical activity, in short, between economics as a discipline and economy as a thing. If economic theory knows so little about the marketplace, is it not simply because in striving to abstract and generalize it has ended up becoming detached from its object? Thus, the weakness of market theory may well be explained by its lack of interest in the marketplace. To remedy this shortcoming, economics would need only to return to its object, the economy, from which it never should have strayed in the first place.

The matter, however, is not so simple. The danger of abstraction and unrealism which is supposed to threaten every academic discipline—and which time and again has been exposed and stigmatized,

notably by economic sociology—is certainly real; it is the formulation of this danger that is suspect. It takes at face value a conception of science which the anthropology of science and techniques (AST) has undermined over the past few years. Saying that economics has failed by neglecting to develop a theory of real markets and their multiple modes of functioning, amounts to admitting that there does exist a thing—the economy—which a science—economics—has taken as its object of analysis. The point of view that I have adopted in this introduction, and which the book strives to defend, is radically different. It consists in maintaining that economics, in the broad sense of the term, performs, shapes and formats the economy, rather than observing how it functions (Latour, 1987) (Callon, 1994).

In order fully to assess the contribution of economics to the constitution of the economy we would need to write a history which has yet to be invented. What we do have are separate stories, of economic thought, presented according to a purely disciplinarian logic, on the one hand, and of economic activities, carefully separated from economics, on the other; on the one hand a history of ideas showing the progressive development of the theory and its concepts (reconstituting for example the genealogy of the market concept)[2] and on the other a social history of the economy (which relates, for example, the evolution of the different forms of market organization). That a degree of interdependence exists between these two histories is hardly questionable, even if this has not been systematically studied. That is why it would be fascinating to construct a social history of economics which would show how abstract notions such as that of supply and demand, or those of interconnected markets[3] (à la Walras (Walras, {1926} 1954)), imperfect competition (as proposed by Chamberlin (Chamberlin, 1933)) or incentives, have been formulated in constant relation to practical questions which, in turn, they help reformulate (Dumez, 1985). Karl Polanyi brilliantly demonstrates in *The Great Transformation* that this type of history is both possible and filled with lessons. His book is often used to criticise the myth of the self-regulating market. But it is also, and above all, one of the rare attempts to link up economics and economy, with a convincing analysis of the role of economic theories, such as that of Ricardo, in the establishment of a labour market.

The aim of the present book is to contribute to the analysis and understanding of the subtle relationships between economics and the economy; not within an historical perspective, although some chapters do include historical material, but within a deliberately anthropological one. To give a broad outline of this perspective, the

most convenient starting point is the general definition of the market proposed by Robert Guesnerie in his attempt explicitly to raise the question of relations between the market and the marketplace (Guesnerie, 1996). According to Guesnerie, a market is a coordination device in which: a) the agents pursue their own interests and to this end perform economic calculations which can be seen as an operation of optimization and/or maximization; b) the agents generally have divergent interests, which lead them to engage in c) transactions which resolve the conflict by defining a price. Consequently, to use Guesnerie's words, 'a market opposes buyers and sellers, and the prices which resolve this conflict are the input but also, in a sense, the outcome of the agents' economic calculation.'

This definition has the advantage of stressing the essential:

- a market implies a peculiar anthropology, one which assumes a calculative agent or more precisely what we might call "calculative agencies';[4]
- the market implies an organization, so that one has to talk of an organized market (and of the possible multiplicity of forms of organization) in order to take into account the variety of calculative agencies and of their distribution;[5]
- the market is a process in which calculative agencies oppose one another, without resorting to physical violence, to reach an acceptable compromise in the form of a contract and/or a price.[6] Hence, the importance of the historical dimension which helps us to understand the construction of markets and the competitive arrangements in which they are stabilized, for a time and in a place.

The point that needs to be borne in mind is that the agents enter and leave the exchange like strangers. Once the transaction has been concluded the agents are quits: they extract themselves from anonymity only momentarily, slipping back into it immediately afterwards.[7] This sudden metamorphosis is not self-evident; it is highly paradoxical. As Mitchel Abolafia points out in his contribution, it is not easy to make this relationship of strangeness compatible with the unavoidable fact that the agents are in touch with each other during the transaction.

The threefold characterization of the market proposed by Guesnerie leads us to the formulation of our first question: what is a calculative agency?

What calculative agencies are not

Under which conditions is calculativeness possible? Under what conditions do calculative agents emerge?

In order to write and conclude calculated contracts—that is to say, to go into the content of goods and their prices—the agents need to have information on the possible states of the world. More specifically, for calculative agents to be able to make decisions they need at least to be able to: (i) establish a list of the possible states of the world (each state of the world being defined by a certain list of actors and goods, and by a certain distribution of these goods amongst the actors); (ii) rank these states of the world (which gives a content and an object to the agent's preferences); (iii) identify and describe the actions which allow for the production of each of the possible states of the world.

An essential point in this general definition needs to be noted. For an agent to be able to calculate—ie to rank—her decisions, she must at least be able to draw up a list of actions that she can undertake, and describe the effects of these actions on the world in which she is situated. This presupposes the existence in organized form of all the relevant information on the different states of the world and on the consequences of all conceivable courses of action and the access of all this information to the agent. Thus she will not only be able to get an idea of possible goals and rank them, but also mobilize the resources required to attain them.[8]

Before going on, in the following section, to address the conditions under which decisions are calculable, we need to discuss two classical points of view: that of cognitive psychology and that of cultural influences.

Cognitive psychology presumes that individual economic agents are capable of mental calculation. Now, this hypothesis is far too demanding. One can not attribute to the agents the capacity of mental calculation. This has been shown with regard to scientists who, since Locke and throughout the history of classical economics, have served as models. Cognitive anthropology has, however, brilliantly confirmed it and extended it to all ordinary agents (d'Andrade, 1995). Calculating—we shall limit ourselves here to this point—is a complex collective practice which involves far more than the capacities granted to agents by epistemologists and certain economists. The material reality of calculation, involving figures, writing mediums and inscriptions—and I shall return to this

point—are decisive in performing calculations. From the fact that calculations are made in the quasi-laboratories of calculative agencies (the word agent places too much weight on the individual) we should not infer that there are calculative beings, no matter how well or poorly informed they may be.[9] From collective performance we cannot induce individual mental competence.[10]

The other explanation, symmetrical in relation to the first one, consists of looking at cultural frames for the origin of the agents' calculative competence. Rather than postulating that the ability to calculate is an intrinsic property of *homo sapiens*, it is the culturally or socially constructed dimension of this competence which is emphasized. Irrespective of the mediations through which this influence is supposed to be exercised, it is asserted that in all cases certain social structures or cultural forms favour calculation and selfish interests while others induce agents to be altruistic, disinterested, generous and even to give freely. The socio-cultural context functions as an injunction, sometimes silent but always effective: 'to survive, to exist, thou shalt calculate!'. DiMaggio has synthesized this approach very well in addressing the question of the role of culture in the constitution of market societies. Culture, he explains, is frequently called upon to explain the appearance of rational actors, the atoms of the market economy, because agents, in their behaviour and calculative capacities, differ from one society to the next: 'Some person concepts (those entailing much agency and individuality) arguably render persons better equipped to operate in market contexts than others'. This difference of equipment—the word is well chosen—is frequently invoked, notably in studies of developing countries or of so-called transitional economies. If the agents resist calculative rationality and hence the market, it is because they are 'embedded' in the social or cultural frames which turn them away from it (DiMaggio, 1994).

Bai Gao, in his contribution, draws upon the Japanese case to show that this culturalist approach, which claims to explain why some societies block the emergence of calculative agencies, is so weak that it fails to account for an even simpler problem: that of the shift from one modality of calculative agency to another. In the case of Japan it is not a question of explaining why, suddenly, economic agents started calculating, but of why they changed their ways of doing so. The transformation which gripped the Japanese economy at the end of the Second World War consisted essentially of the appearance of new criteria for evaluating economic efficiency and profitability, which favoured co-operation and the long term. What

Gao proves is the impossibility of placing the origins of this little shift, of this substitution of one type of calculation for another, in culture. Since culture cannot explain this minor evolution, it is even less apt to account for a major transformation such as the one which makes uncalculative agencies calculative.

In order to become calculative, agencies do indeed need to be equipped. But this equipment is neither all in the brains of human beings nor all in their socio-cultural frames or their institutions. What is it then? How on earth does one become calculative, since this competence is neither in human nature nor in institutions?

In search of possible sources of calculativeness

How can we clarify and then characterize this equipment which is so easily overlooked and yet without which no calculation is possible? One strategy consists in considering situations of extreme uncertainty, those in which the limits of the solutions proposed by cognitive psychology and culturalism are most obvious. How does an atomized agent manage to start calculating when the information she needs to calculate is inexistent or contradictory, or when there are no institutional guidelines which are sufficiently stable and legitimate both to allow for shared expectations and to make an unknown future manageable?

Modern economic theory has devoted significant efforts to explaining the possibility of calculation in situations of radical uncertainty or even ignorance. As a start, I shall recall the main solutions put forward (Eymard-Duvernay, 1996). I shall then point out their limits—owing to the closeness of these solutions to the cognitive psychological paradigm—and introduce social network analysis. This, in turn will lead me, after several reformulations, to the sought-after solution.

Market co-ordination encounters problems when uncertainties on the states of the world, on the nature of the actions which can be undertaken and on the expected consequences of these actions, increase. Problems are at their worst when the uncertainties leave room for pure and simple ignorance.[11] Now, such situations are the rule and not the exception. This is even more obvious with the uncertainties generated by technosciences. The general question is thus the following: how can agents calculate when no stable information or shared prediction on the future exists?

In order to maintain the possibility of co-ordination, economists

have proposed several solutions which—they assure us—are, or ought to be, applied in concrete market situations. The most 'orthodox' solution is that of contingent contracts. Contingent contracts are revisable contracts; their renegotiation is planned, thus taking into account the occurrence of events specified beforehand (Hart and Moore, 1988).[12] The greater the uncertainties, the more difficult it is to implement this solution. It implies, to a certain extent, that the agents spend their time renegotiating their contracts, that is to say, interacting and exchanging information as it is produced. In this case market co-ordination as such disappears, leaving room for uninterrupted social interaction involving many different agents. These agents, no matter how much they wish to do so, are no longer able to become strangers; they are entangled.[13] I shall revert to this notion a little further.

Another solution is that of a focal point. In this case we presume that the agents share common knowledge or have the same points of reference which guarantee the co-ordination. The nature of these references known to each agent is highly variable. It may pertain to a shared culture, rules, procedures, routines or conventions which guarantee the adjustments and predictability of behaviour. Socio-economics has studied in detail these intermediate realities to explain the co-ordination of market action. But it is easy to show that these different solutions suffer from the same limits. Whether we talk about a common culture or of shared rules or conventions, we encounter the same stumbling block: a rule, convention or cultural device does not govern behaviour completely since it entails irreducible margins of interpretation. These margins of interpretation can be removed only during interaction, negotiation or discussion.

All these solutions have the common feature of providing autonomous—over-autonomous—and isolated—over-isolated—agents with the social relations which, by opening them up to their environment, enable them to co-ordinate their action with those of other agents. Why not take this dependence of their environment as a starting point? Why not consider that one solution to the question of co-ordination, in a situation of radical uncertainty, is to admit that beneath the contracts and the rules there is a 'primitive' reality without which co-ordination would not be possible? An understanding of this ultimate basis is the purpose of the notion of a social network or, more broadly, the notion of embeddedness as initially formulated by Polanyi and later refined by Granovetter. If agents can calculate their decisions, irrespective of the degree of

uncertainty concerning the future, it is because they are entangled in a web of relations and connections; they do not have to open up to the world because they contain their world. Agents are actor-worlds (Callon, 1986a).

At this point it is useful to recall Granovetter's solution, for it has been the source of many misinterpretations preventing us from seeing its originality and its true limits as well as, more generally, those of social network analysis (Granovetter, 1985). The solution lies in his definition of the notion of a network. Granovetter first does away with the classical opposition between *homo sociologicus* and *homo economicus*. He convincingly shows that beyond their oft-asserted differences, the two conceptions both assume the existence of individual agents with perfectly stabilized competencies. The thesis of over-socialization, like that of under-socialization, rests on a common hypothesis: that of the existence of a person closed in on himself—a *homo clausus*, to use Elias' expression. This hypothesis precludes any solution to the problem of co-ordination in a situation of radical uncertainty . For Granovetter the only possible solution is that provided by the network; not a network connecting entities which are already there, but a network which configures ontologies. The agents, their dimensions, and what they are and do, all depend on the morphology of the relations in which they are involved.

This crucial point warrants clarification. The network, in this sense, does not link agents with an established identity (that is to say, endowed with a set of fixed interests and stable preferences) to form what would be a rigid social structure constituting the framework in which individual actions are situated. It is on this point that embeddedness in a network of social relations, as defined by Granovetter, is different from embeddedness according to Polanyi. The latter assumes the existence of an institutional frame constituting the context in which economic activities take place.[14] In the social network as defined by Granovetter, the agents' identities, interests and objectives, in short, everything which might stabilize their description and their being, are variable outcomes which fluctuate with the form and dynamics of relations between these agents (Callon, 1986b), (Smith, 1994).

This means that the agent is neither immersed in the network nor framed by it; in other words, the network does not serve as a context. Both agent and network are, in a sense, two sides of the same coin. Either one enters the network through the agents and one is immediately tempted to characterize them by the shape of their

relationships; or one focuses on the network itself, in which case one uses the associations of its constitutive agents to describe it. The best way to explain the radical nature of this approach—which amounts to replacing the two traditionally separate notions of agent and network by the single one of agent-network—is through examples drawn from the now substantial literature on the subject.

The equivalence between agency and form of network was clearly explained in one of Granovetter's seminal articles: 'The strength of the weak ties' (Granovetter, 1973). The capacity of an agent to make autonomous choices, that is to say, to make decisions which do not merely fall in line with the decisions made by other agents, is not inscribed in her nature; it coincides with the morphology of her relationships. When she finds herself at the intersection of two networks which scarcely, if at all, overlap, the range of available options affords her with a large margin of manœuvre. She is even endowed with the possibility of considering action in terms of alternative choices and her faculty for arbitration is enhanced. If, however, the relations are redundant, the agent is deprived of all ability to make choices. This example shows that it is possible to characterize the different types of agency through the distribution of relationships. Studies by Burt on structural holes uphold and generalizes this thesis. In a network, a structural hole corresponds to the points, and hence the agents, whose contacts are not related to one another. Burt shows that structural holes are associated with agencies capable of strategic combinations and manipulation. Following the same approach, he suggests that entrepreneurial action is linked to certain relational configurations. 'When you take the opportunity to be the tertius you are an entrepreneur in the literal sense of the word—a person who generates profit from being between others' (Burt, 1993). We could thus review the different types of configuration and show that each of them corresponds to a particular type of agency, that is to say, a particular mode of action. However, to make the point, it would be simplest to consider the elementary unit of the network: the triangular relationship. The bilateral relationship, so strongly emphasized by interactionism, teaches us nothing about the social dimension. Simmel said so long ago: relations between **A** and **B** are not enough to explain their actions and identities. These become intelligible only when embedded in the indirect and sometimes invisible relations bearing on them. One need simply add a third party, **C**, and adopt its point of view, for the relationship between **A** and **B** to become analysable and comprehensible. Burt describes three possible strategies for **C**: that of the *mediator* where

in case of conflict between **A** and **B**, **C** acts as an intermediary and helps them to negotiate; that of *tertius gaudens* where **C** takes advantage of conflict between **A** and **B** whose forces balance out; and, finally, that of the *despot* (*divide per impere*) where **C** creates conflict to preclude coalition and align the interests of **A** and **B** with his own. As we can see, without bringing **C** into the picture, whatever happens between **A** and **B** remains incomprehensible (Hatchuel, 1995). Inversely, the possibilities for action of **C** remain unintelligible if we fail to take into account both **A** and **B**. This elementary algebra of social relations, starting with the triad, becomes increasingly complex as other relations are added to it. The logic remains, however: it identifies the action with a sort of positional calculation.

This similarity between network and action, rooted in the three-party game, knows no bounds. Granovetter shows, for example, by comparing two Philippine towns, that there is a correlation between the degree of personalization of credit and the size and density of the social networks. Baker, in a bold analysis of financial future markets, shows that the very status of money—why, for example, a financial asset should be considered as closest to money—in industrialized societies where numerous currencies proliferate, depends on the positions of the holders of these assets in their network (Baker, 1984).[15] David Stark (this monograph) provides a cogent illustration of this point: talking of ownership rights in the absolute, and thus of possibilities for agents to engage in certain courses of action, without taking into account the ties binding them, makes little sense. To understand what property rights consist of in a concrete socio-economic context, in other words, to reconstitute the set of rights and obligations incumbent on each agent, there is no alternative but to analyse relationships. This 'swing-wing' ontology of the agency, which changes with the changing shapes of the network, is shared by so-called evolutionary economics simply because 'in an organicist ontology relations between entities are internal rather than external and the essential characteristics of any element are seen as outcomes of relations with other entities' (Hodgson, 1994). We would be hard pressed to find a better definition of agent-network.

What benefits accrue from social network analysis? Answer: a simple explanation of the possibility that agents have of calculating, when caught up in situations of extreme uncertainty. They do not have to open up to their environment in order to exchange or get information, or to negotiate and co-ordinate their decisions so as to lay the foundations of a possible order. They are open and con-

nected; it is from these connections that they derive their ability to calculate. *Homo clausus* of economic theory is replaced by *homo apertus* of social network analysis, and the degrees and forms of opening of the latter depend on the form of the relationships. Whether the situation is uncertain or not, the only thing that counts for *homo apertus*, and which he takes into account, is the network of direct and indirect relations surrounding him. This calculative logic is clearly expressed in the triangular games mentioned above, where the elementary action consists of a calculation of alliances and conflicts. Irrespective of whether the states of the world and the causal links between decisions and their effects are known or not, the agency follows its combinatorial logic, that of connection and disconnection, which is entirely relational.

This solution seems neat. It eliminates the insurmountable problem posed by *homo clausus* who in situations of uncertainty has no alternative but to open up in order to re-establish the co-ordination. Is it not, however, a bit too easy? Before answering this question it would be relevant here briefly to mention and discuss the usual critiques exposing the reductionist nature of social network analysis. DiMaggio, for example, very subtly points out that it is hardly convincing to deduce the strategy of an agent from her position in a network of relations (DiMaggio, 1994). Between a position and an action, is it not necessary, he asks, to interpose values, preferences and projects; in short, everything which defines the agency and avoids reducing action to structural determinations? Is it not excessive, he adds, to consider that an agent in a structural hole has no objectives and projects other than constantly building up more non-redundant relationships with the aim of increasing her capacity for control? This criticism, which reintroduces the dualism of structures and agency, or positions and dispositions, is by no means groundless. Many social network analysts lay themselves open to it by introducing the notion of social capital. Burt, for example, considers that an agent's relationships with other agents, whether direct or indirect, are all comparable to a social capital which she mobilizes for the purpose of developing her own relational strategies. This social capital is greater when the agent finds herself in a very obvious position of a structural hole. Each relationship, owing to its non-redundancy, provides her with information and opportunities for specific action. This concept, pervasive in sociology (Coleman, 1988), (Bourdieu, 1979), thoroughly undermines the strength of social network analysis. By dissociating agency and network, it widens the gap between agency and structure. The agent, simply

because she mobilizes a capital—of which the form and volume do of course depend on the form of the network and on her position therein—escapes, at least in part, from the network. Cast aside, freed from the network to which she is attached only by the resources it provides, the agent regains her autonomy. The monism of social network analysis is thus substituted for the traditional dualism of agencies and structures. The notion of social capital is the Trojan horse of dualism since it severs the formal identity between agent and network; it splits the agent-network again by introducing the usual opposition between the action and the resources of that action.

If we are to avoid the temptation of dualism, we need to banish any explanation separating the agency from the network and, in particular, avoid the usual concepts of resources or social capital so as to maintain, against all odds, what some denounce as impoverishing reductionism. But is this intransigence sufficient? Does it enable us satisfactorily to explain the emergence of calculating agencies in situations of radical uncertainty? Should we settle for a pure social network analysis, cleansed of all dualistic influence?

Gift giving and framing

To answer this question we need to revert to the notion of calculation. We have seen that in order to maintain the *homo clausus* of economic theory in a state of calculativeness when faced with uncertainty, we have to agree to open him out onto his environment and to grant him the ability to develop complex interactions with other agents. In order to be calculative the agent must be open and, according to social network analysis, once open and caught up in the triangular game he is *de facto* calculative. The assumption of openness of social network analysis thus transforms the problem into a solution: the agent-network is by construction calculative, since all action is analysed in terms of combinations, associations, relationships and strategies of positioning. The agent is calculative because action can only be calculative.

Should we stop there and say that social network analysis exhausts the questions of calculation and of the emergence of calculative agencies, dismissing the usual distinction between certain and uncertain situations and, consequently, replacing the notion of information by the notion of relation? No, because ever since Mauss, social sciences have been confronted with the question of

the gift, that is to say, the existence of uncalculated, disinterested actions (Mauss, [1925] 1969). Social network analysis explains what Mauss finds so self-evident that he does not even try to explain it: the existence of calculative agencies. But how does social network analysis account for the existence of disinterestedness to which Mauss grants utmost importance? It is once again by examining this ever-relevant question of the gift and disinterested giving which will allow us to proceed further. If we wish to explain the emergence of calculative agencies, we will also have to explain the emergence of non-calculative ones, which in turn will lead us to amend social network analysis substantially, without, however, overlooking its contribution.

The analysis of disinterestedness or, in other words, of the absence of calculativeness, generally wavers between two extreme interpretations.[16] The first emphasizes the subjective dimension of disinterestedness. The action is disinterested if the agent wittingly avoids introducing any element of calculation. The second, by contrast, highlights the objective dimension: disinterestedness is an illusion. This illusion may, in turn, have two origins: (i) the agent is generous and, despite believing herself to be altruistic, she only inscribes her action in networks of reciprocity which transcend her—here disinterestedness is merely the driving force enabling each agent to play his or her part in a system of exchange, since a gift is always followed by a counter-gift which cancels out the asymmetry created by the gift;[17] (ii) disinterestedness, often likened to trust, is considered as a consequence of a more primitive calculation of which the agent is not aware: 'If I abandon myself, if I trust without any calculation, that is because it's the most rational solution when, in situations of uncertainty, I try to maximise my gain expectations'.[18]

The first explanation depends on the subject's lived experience, whereas the second takes apart its mechanisms and springs to show that this experience is merely an illusion. Between these two extreme solutions (is it better to grant everything to the subject or to take everything away from it?), which one is to be preferred? The latter cannot be chosen because it dissolves the agency in the structures and resolves the problem before posing it. The former warrants closer examination, however, for we cannot reduce social science to a mere recording of the states of the subject's conscience. To avoid these two extremes, the most moderate authors adopt a middle course. Williamson, for example, maintains that most actions and decisions are calculated, even when they resemble trust

(Williamson, 1993). Yet he recognizes the existence of behaviours associated with the family, love and friendship, from which calculation is absent. As Pascal put it, man is neither all beast nor all angel, he is capable of switching from calculativeness to disinterestedness depending on the circumstances. However, Williamson would add, the part that is beast, that of calculativeness, is by far the greater of the two.

Moderation is praiseworthy. But is it satisfactory from a theoretical point of view? Obviously not. Asserting that there do exist spheres of activity and types of behaviour in which the agent does not calculate, and others in which he becomes a calculator, is too easy an answer to the question we posed—that of the conditions of the emergence of non-calculative agencies. That agents refrain from calculating when they are engaged in relations from which calculation is absent is a solution that hardly helps to solve the problem.

To my knowledge there exists on the social science market only one answer to the question asked which reconciles the subjective experience of disinterestedness with the practical observation that, in the absence of conscious calculation, the results of the action initiated by the agent—that is to say, the return in the form of a counter-gift—can nevertheless reasonably be anticipated by the observer. This is the solution (which makes the actions that the agent does not calculate, calculable for the observer), proposed by Bourdieu. It is based on two elements. The first is the interval between the gift and the counter-gift. This interval makes it possible to 'mask the contradiction between the intended truth of the gift as a generous, free and one-way gesture, and the truth that makes it a moment in a relationship of exchange which transcends the singular acts of exchange' (Bourdieu, 1997). The time which passes and which, in the moment of giving, the agent has in front of himself like an obscure space hiding the future counter-gift, remains unrealized, allows for the subjective experience of disinterestedness. Amnesia, socially structured by the time lag between the gift and its return gift, generates generosity as a subjective experience. But—and this is where the second element comes in—the return gift does end up coming, thus forming a true gift-and-counter-gift economy. The generous disposition of agents—that is to say, their propensity to give, receive and give back, to use the famous triple obligation described by Mauss—is encouraged by institutional incentives. These ensure that generosity is recognized as such and is socially viable. This solution has an immense advantage. It spares our argument from all essentialism. There is nothing in human nature, there

are no sectors of activity, which impose, exclusively or successively, either disinterested or calculative actions. The fact that an agent calculates or does not has nothing to do with its inherent selfishness or altruism; nor is it due to the nature of the relationships in which it is engaged (a market transaction or, by contrast, love, friendship or the family). It is, and this is the solution suggested by Bourdieu, the formatting of these relationships which will orientate the agent towards calculativeness or disinterestedness.

The analysis which Bourdieu offers us of this formatting has the merit of putting us on the right track towards a solution to the more general question of the emergence of calculative agencies. The time lag, says Bourdieu, is the decisive factor behind the switch from one regime to another, from calculativeness to non-calculativeness. The longer this interval, that is to say, the more time the return gift or counter-gift takes to arrive, moving further and further out of the giver's field of vision, the more the giver will experience herself as disinterested. The shorter the interval, the more the gift will be experienced as calculative. P. Bourdieu, to stress this point, cites the following admirable maxim by La Rochefoucauld: 'Being in too much of a hurry to pay a debt is a form of ingratitude'. When the beneficiary is in a hurry to release herself, she makes it clear that she has opted for a market transaction and therefore that she has calculated her decision. When, on the other hand, she lets time pass, effacing even the memory of the initial decision, she switches to the regime of non-calculative action.

The emergence of a calculative agency, says Bourdieu, depends on a time frame. Either the return gift is in the frame, and the agency is calculative, or it is beyond the frame and she is not. In the first instance the decision takes into account the return gift, in the second it ignores it. This taking into account depends only on the framing, the tracing of a boundary between relationships and events which are internalized and included in a decision or, by contrast, externalized and excluded from it. This analysis is compatible with that proposed by social network analysis: calculation does indeed concern relationships and combinations. But it also enables one to explain what social network analysis cannot explain, ie uncalculated action, by introducing the notion of framing. Framing demarcates, in regards to the network of relationships, those which are taken into account and those which are ignored. The difference between calculated action and uncalculated action is thus reduced to its simplest expression: it is encompassed in the taking into account or not of the return gift. The analysis of this mechanism of inclusion or

exclusion, that is to say, the examination of the notion of framing, merits our further attention.

Framing as a process of disentanglement

To explain the absence of calculation, Bourdieu reduces framing to its time dimension. **A** calculates her action when she includes in her decision the most probable subsequent decisions of the other agents: **B**, **C**, etc. Either **B**'s counter-gift is anticipated, placed in the frame, and **A** calculates; or, and this is the virtue of time, it is ignored, placed outside the frame, and the action switches over to disinterestedness. In this section I shall broaden this definition of framing by stressing its multidimensionnality.

I shall show that if calculations are to be performed and completed, the agents and goods involved in these calculations must be disentangled and framed. In short, a clear and precise boundary must be drawn between the relations which the agents will take into account and which will serve in their calculations and those which will be thrown out of the calculation as such.

The extreme case of framing is that in which, as Bourdieu describes it, no relationship whatsoever is taken into account. The frame is empty—which is another way of saying that no framing has taken place—and the agent finds himself faced with his decision alone. He consequently switches to pure generosity for all possibilities of calculation, which implies that at least two terms relate to each other, are eliminated. However, to explain this extreme case we need to consider the question of framing mechanisms in all their generality. How can we account for the fact that the openness of the *homo apertus* of social networks can be made variable, so that it passes through all the forms of agency from the most purely non-calculative to the most purely calculative? How is the delimiting, or framing, of relationships at a point in the network achieved? This is the question to which we will now turn.

Economic theory has already addressed this question very specifically through the notion of externality which allows the introduction of the more general question of disentanglement (Callon, his contribution).

Economists invented the notion of externality to denote all the connections, relations and effects which agents do not take into account in their calculations when entering into a market transaction. If, for example, a chemical plant pollutes the river into which it

discharges its toxic waste, it produces a negative externality. The interests of fishermen, bathers and other users are harmed and in order to pursue their activity they will have to make investments for which they will receive no compensation. The factory calculates its decisions without taking into account the effects on the fishermen's activities. Externalities are not necessarily negative, they may also be positive. Take the case of a pharmaceutical company which wants to develop a new drug. To protect itself it files a patent. However, in so doing, it divulges information which becomes available to competitors and can be used by them to develop their own research and development.

The notion of externalities is essential in economic theory because it enables us to emphasize one of the possible shortcomings of the market, one of the limits of its effectiveness. But it is also very useful for understanding the meaning of the expression 'constructing a market'. This is where the joint notions of framing and overflowing fit in, which I shall come back to shortly.

Social network analysis as promoted by Granovetter reminds us that any entity is caught up in a network of relations, in a flow of intermediaries which circulate, connect, link and reconstitute identities (Callon, 1991). What the notion of externality shows, in the negative, is all the work that has to be done, all the investments that have to be made in order to make relations visible and calculable in the network. This consists of framing the actors and their relations. Framing is an operation used to define agents (an individual person or a group of persons) who are clearly distinct and dissociated from one another. It also allows for the definition of objects, goods and merchandise which are perfectly identifiable and can be separated not only from other goods, but also from the actors involved, for example in their conception, production, circulation or use. It is owing to this framing that the market can exist and that distinct agents and distinct goods can be brought into play. Without this framing the states of the world can not be described and listed and, consequently, the effects of the different conceivable actions can not be anticipated.

What economists say when they study externalities is precisely that this work of cleansing, of disconnection, in short, of framing, is never over and that in reality it is impossible to take it to a conclusion. There are always relations which defy framing. It is for these relations which remain outside the frame that economists reserve the term externalities. The latter denotes everything which the agents do not take into account and which enables them to conclude their calculations. But one needs to go further than that.

When, after having identified some of these externalities, the agents, in keeping with the predictions of Coase's famous theorem, decide to reframe them—in other words to internalize the externalities—other externalities appear. Callon, in his contribution, suggests the term 'overflowing' to denote this impossibility of total framing. Any frame is necessarily subject to overflowing. It is by framing its property rights by means of a public patent that a pharmaceutical firm produces externalities and creates overflowing. It is by purifying the products that it markets that a chemical firm creates the by-products which escape its control.

The impossibility of eliminating all overflowing has, in reality, a profound reason discussed by Callon in his chapter. To ensure that a contract is not broken, to delimit the actions than can be undertaken within the framework of this contract, the agents concerned have to mobilize a whole range of elements, called, to use Leigh Star's expression, boundary-objects (Star and Griesemer, 1989). These objects allow the framing and stabilization of actions, while simultaneously providing an opening on to other worlds, thus constituting leakage points where overflowing can occur.

Let us take the most simple example, that of a market transaction concerning a motor car. The transaction is possible because rigorous framing has been performed. This framing has reduced the market transaction to three distinct components: the buyer, the producer-seller, and the car. The buyer and the seller are identified without any ambiguity, so that property rights can be exchanged. As for the car, it is because it is free from any ties with other objects or human agents, that it can change ownership. Yet even in this extreme, simple case, not all ties can be cut. Something passes from the seller to the buyer: the car, which conveys with it the know-how and technology of the producer. All the property rights in the world cannot prevent this overflowing, except by eliminating the transaction itself. If the buyer is a firm, reverse engineering becomes possible. This is a general point which can be expressed as follows: the simple fact of framing the transaction because it mobilizes or concerns objects or beings endowed with an irreducible autonomy, is a source of overflowing. Complete framing is a contradiction in terms, whereas complete externalization is possible, as suggested, in the case of pure gifts.

The framing/overflowing duo suggests a move towards economic anthropology and more specifically towards the entangled objects of Thomas and the careers of objects of Appadurai (Appadurai, 1986). The latter shows that the status of goods can change, that they can be commoditized, decommoditized and then recommodi-

tized, etc.: one is not born a commodity, one becomes it. Thomas's thesis expands on and enhances Appadurai's, describing precisely what constitutes this process of merchandization. Thomas gives the best theoretical explanation for this reconfiguring in his discussion of the distinction between market transactions and gifts. His argument is fairly complex and subtle but I think that it can be summed up in the following passage:

> Commodities are here understood as objects, persons, or elements of persons which are placed in a context in which they have exchange value and can be alienated. The alienation of a thing is its dissociation from producers, former users, or prior context (Thomas, 1991).

The last sentence of this quotation is obviously the important one. To construct a market transaction, that is to say, to transform something into a commodity, and two agents into a seller and a consumer, it is necessary to cut the ties between the thing and the other objects or human beings one by one. It must be decontextualized, dissociated and detached. For the car to go from the producer-seller to the customer-buyer, it has to be disentangled. It is on this condition that the calculation can be looped and that the deal can be closed; that the buyer and the seller, once the transaction has been concluded, can be quits. If the thing remains entangled, the one who receives it is never quit and cannot escape from the web of relations. The framing is never over. The debt cannot be settled.[19]

This notion of entanglement is very useful, for it is both theoretical and practical. It enables us to think and describe the process of 'marketization', which, like a process of framing or disentanglement, implies investments and precise actions to cut certain ties and to internalize others. The advantage is that this analysis applies to anything and enables one to escape the risk of essentialism. To entangle and to disentangle are two opposite movements which explain how we move away from or closer to the market regime. No calculation is possible without this framing which allows one to provide a clear list of the entities, states of the world, possible actions and expected outcome of these actions.

Strawberry story

To my knowledge, few scholars have focused on analysing this work of framing which allows for calculation and consequently makes

possible the emergence of calculative agencies. One of the best studies I know is that of Marie-France Garcia on the transformation of the table strawberry market in the Sologne region of France (Garcia, 1986). This transformation occurred in the early 1980s and resulted in the constitution of a market with characteristics corresponding to those described in political economy manuals:

- existence of a perfectly qualified product;
- existence of a clearly constituted supply and demand;
- organization of transactions allowing for the establishment of an equilibrium price.

Garcia analysed all the investments required to produce the frames allowing for the construction of this market. First material investments were needed. Uncoordinated transactions between producers and intermediaries engaged in interpersonal relationships were henceforth held in a warehouse built for this purpose. The producers took their product there daily, packed in baskets, and exhibited it in batches in the warehouse. Each batch had a corresponding data sheet which was immediately given to the auctioneer. The latter entered the data into his computer and compiled a catalogue which was handed out to the buyers. Producers and shippers then went into the auction room which was designed in such a way that buyers and sellers could not see one another but nevertheless had a clear view of the auctioneer and the electronic board on which prices were displayed. The display of the strawberries in the hall and the catalogue enabled all parties concerned to have precise knowledge of the supply in terms of both quality and quantity. Moreover, the fact that the different batches were displayed side by side highlighted differences in quality and quantity between producers. The latter could compare their own production with that of their competitors, something which had not been possible formerly when collections were made locally. As Garcia notes: 'those growers who had been caught up in personal relationships with intermediaries and shippers entered into impersonal relationships'.

All of these different elements and devices contributed to the framing of transactions by allowing for the rejection of networks of relations, and thus by constructing an arena in which each entity was disconnected from the others. This arena created a space of calculability: the technique of degressive bidding, the display of transactions on the electronic board, the relative qualification of batches of strawberries on their data slips, and knowledge of the national market all made the transactions calculable. As this example clearly

shows, the crucial point is not that of the intrinsic competencies of the agent but that of the equipment and devices (material: the warehouse, the batches displayed side by side; metrological: the meter; and procedural: degressive bidding) which give his or her actions a shape.

To these elements of framing, so often overlooked and without which no overflowing could be contained, must be added those the importance of which economic theory has constantly—and rightly so—stressed. The first in line are property rights which define the right to use certain assets, to derive an income from them and to sell or transfer them definitively to a third party. Without the existence of such rights it goes without saying that calculation becomes meaningless, since the actions and their results cannot be imputed to anyone at all. For agencies to exist, there have to be procedures of attribution of actions and of their effects. Of course, in the establishment and evolution of these property rights, the state and the legal system have an irreplaceable role.[20]

The existence of one or several currencies also facilitates the emergence of calculative agencies. The most decisive contribution of money is not, however, where one would expect it to be. To be sure its main contribution was to provide a unit of account without which no calculation would be possible. However the essential is elsewhere. Money is required above all—even if this point is often overlooked—to delimit the circle of actions between which equivalence can be formulated. It makes commensurable that which was not so before. The case of negative externalities, for example the effects of pollution produced by a chemical plant, clearly illustrates this point. Once identified and acknowledged, overflowing, if it is to be framed and thus internalized, has to be measured (Callon, this volume). This measuring involves the establishment of a metrology, anchored in techno-scientific instruments, which enables the agents concerned to establish quantitative correspondences between a cause (eg, the discharge of dioxin) and an injury (eg, a probability of cancer). This correlation between a risk of death and the activity of a factory, established by means of laboratory experiments and epidemiological research, creates a link between two distinct series of events. But if this relationship (between a discharge and deaths) becomes calculable by the agents, it is not enough merely to prove its existence; it has to be expressed in the same units. This is where money comes in. It provides the currency, the standard, the common language which enables us to reduce heterogeneity, to construct an equivalence and to create a translation between a few

molecules of a chemical substance and human lives. Money comes in last in a process of quantification and production of figures, measurements and correlations of all kinds. It is the final piece, the keystone in a metrological system that is already in place and of which it merely guarantees the unity and coherence. Alone it can do nothing; combined with all the measurements preceding it, it facilitates a calculation which makes commensurable that which was not so before: grams of dioxin and a human life. Thanks to it the agents can measure the investments required to reduce the risk of death below a certain threshold. Money establishes an ultimate equivalence between the value of a human life and that of investment in pollution abatement.

Furthermore what Garcia suggests, and what we shall be looking at in the following section, is that beyond the material, procedural, legal and monetary elements which facilitate the framing and construction of the space of calculability, there is a capital, yet rarely mentioned, element: economic theory itself.

In the construction of the strawberry market, a young counsellor of the Regional Chamber of Agriculture played a central part. Remarkably his actions were largely inspired by his university training in economics and his knowledge of neo-classical theory. The project which he managed to launch, through alliances and skill, can be summed up in a single sentence: the construction of a real market on the pure model of perfect competition proposed in economics handbooks. As Garcia says, it is no coincidence that the economic practices of the strawberry producers of Sologne correspond to those in economic theory. This economic theory served as a frame of reference to institute each element of the market (presentation on the market of batches which account for only a small portion of the supply; classification of strawberries in terms of criteria which are independent of the identity of their producers; unity of time and place which makes the market perfectly transparent; and, finally, the freedom of wholesalers and producers alike who are not obliged to buy or sell).

This case provides an outstanding example in that it enables us to follow the birth of an organized market. Above all, it is the purest and most perfect example of market organization. The conclusion that can be drawn from it is extremely simple yet fundamental: yes, *homo economicus* does exist, but is not an a-historical reality; he does not describe the hidden nature of the human being. He is the result of a process of configuration, and the history of the strawberry market shows how this framing takes place. Of course it

mobilizes material and metrological investments, property rights and money, but we should not forget the essential contribution of economics in the performing of the economy.

The embeddedness of economy in economics

The groundwork is now complete for a presentation of the core argument of this volume: the role of economics as a discipline, in the broad sense of the term, in the formatting of calculative agencies. In a sense this argument takes up and pursues the assertion of Max Weber for whom accounting methods were the key prerequisites of modern capitalism (Weber {1992}, 1978) (Weber {1923}, 1981).[21] To show the capacity of economics in the performing (or what I call 'performation') of the economy, we have to start between the two with the set of calculating tools without which calculative agency would not be possible. It is on this point that the chapter by Peter Miller provides a decisive contribution.

Calculativeness couldn't exist without calculating tools. Consequently and in order to understand how they work, full significance has to be restored to that humble, disclaimed and misunderstood practice: accounting and the tools it elaborates. That notions such as cost and profit depend directly on accounting tools is obvious but not of prime importance here. The most interesting element is to be found in the relationship between what is to be measured and the tools used to measure it. The latter do not merely record a reality independent of themselves; they contribute powerfully to shaping, simply by measuring it, the reality that they measure. That is what Miller shows by analysing the role of accounting tools in the production of zones of calculability in the framing of decisions.

In his demonstration, Miller considers the evolution and transformation in time of these tools and their related practices. His first observation concerns the collective nature of this process which is carried out by a host of professionals of all kinds, including the accountants themselves but also businessmen, professional associations and even the foremost economists. During the past decades this collective work has grown to such an extent that a real performance measure industry has developed (Meyer, 1994). It is by following the dynamics of the conception, reconception and diffusion of these tools that we are able to discover what makes them powerful and indispensable for internalizing overflowing. Miller shows, for example, how accounting tools progressively frame time

by allowing for calculations of equivalence between events occurring at different dates. He also describes recent developments in management accounting which increasingly call on 'a wide range of non-financial measures, including set-up times, inventory levels, defect and rework rates, material and product velocity within the factory, and much else besides'. In short, the tools are constantly reconfigured to take into account in more and more detail a set of entities and relationships which were hitherto excluded from the framework of calculation. The framing becomes more refined, richer, delving into the complexity of relationships, and in so doing it authorizes decisions which are more and more calculated or (to use the commonly-accepted word) more and more rational.

The existence of calculative agencies correlates closely with that of accounting tools. The relationship does not, however, end there, for the nature and content of calculations made by agencies depend largely on the characteristics of the tools used. Gao shows the variety of the measurement tools and the diversity of their effects on economic dynamics. The choice of accounting tools prioritizing the short term caused Japan to embark on a trajectory which it could leave only by changing its measurement tools. Countless studies have demonstrated that accounting tools and, more generally, management tools influence agents behaviours. These effects never appear so clearly as when tools induce strategies of adaptation. Meyer recalls, for example, the effect produced by the generalization of EPS (earning per share) intended as an incentive for managers: 'managers adapted to it by finding ways to improve reported earnings, by deferring maintenance, depreciation, research and development, expenditures and the like' (Meyer, 1994). Not only do accounting tools constitute spaces of calculability and define the way the calculation is made up, but also, through the reactions they provoke, new calculative strategies emerge which lead to the changing of goals. An analysis that fails to take these tools into account would be unable to understand the emergence and logic of calculative agencies, for all decisions are the outcomes of this complex calculating system.

These different tools are not isolated; whether compatible or adjusted to one another or not, they are connected to one another and are collectively carried along by the dynamic so well described by Miller. It is hardly surprising that in these conditions the possibility of establishing a link between micro and macro calculations depends entirely on the existence and availability of tools allowing for this connection. The aggregation of behaviours and calculations is not a theoretical problem; it is a problem of accounting technology.

In this vast accounting system, a true metrological infrastructure in which economic activities are embedded, some areas are more robust and solid than others. Paradoxically, it is in those sectors which seem most subject to a calculative logic that the development of highly efficient accounting tools is most problematical. This is the case of the future markets studied by Abolafia in his contribution. He presents traders whose only obsession is to make calculated decisions, yet who cannot resolve themselves to framing their decisions once and for all, because the relevant information—that which counts and which they have to take into account—generally comes from outside the frame, from an unpredictable place. What strange calculative agencies who, in order to calculate, constantly have to have an eye on the incessant overflowing which redefines the framework of decisions. The problem of the trader is that of being able at any moment to grasp the state of the overflowing, to identify those agents whose decisions will have an effect on the one he intends to make or who, inversely, will react to his own decisions. In order not to be caught unawares, he must be capable of following the connections, the unexpected links, without however being submerged in the mass of relations and events. How can one perform framing when one has to be attentive to all this overflowing? How is it possible to become *homo clausus* when survival requires one to be *homo apertus*? This question is at the heart of the stock market and the speculative behaviour which it spawns. Nowhere is the tension between framing ad overflowing so intense and so difficult to control.

Measurement tools, designed to manage this tension, are necessarily highly singular because they must be capable of tracking down the incessant overflowing without leaving their frame. When what counts is having an all-embracing view of the network, monitoring all the relations and events, recording the movement of each point (for each point may count), the only suitable tool is a network analyser—one which provides a synthetic, summarized and framed image of the network. Hence chartism, that strange calculative practice, that proto-instrument so to speak which, starting with the aggregated curve which records prices, analyses its shape and attempts at revealing the hidden dynamic of the different individual decisions behind it. The tool is an analyser of form intended to establish an intelligible link between a framed price (and the decision stemming from it) and the set of countless connections and relations which have been framed.

We might be tempted to add that, from a Foucauldian perspective, this vast metrological accounting system, made of tools, calculation

procedures and incorporated competencies, contributes to the 'disciplining', of behaviour and decisions.[22] Miller clearly shows—and his surpassing of Foucault warrants emphasis—that this disciplining is in no way mechanical, irreversible or irrevocable. It evolves and transforms itself since the tools, those solid points in the system, are themselves plastic, open, reconfigurable and, moreover, constantly reconfigured. As framing and calculating tools they have the property, through transforming themselves, of varying the modalities of framing and calculation. They are exchangers which stabilize certain procedures but simultaneously help them to evolve. To explain both the effects of 'disciplining' and the constant reconfiguring of these effects, there is no need to involve agents who defy the implacable logic of institutional devices and arrangements. Tools are at the heart of this dynamic and are responsible for formatting the calculating agencies. Due to their plasticity and their position as mediators they simultaneously allow this formatting to be reconfigured.

Stark (his contribution) takes another step forward by linking this accounting system to forms of justifying action: 'We are all bookkeepers and storytellers. We keep account and we give account, we can all be called to account for our action'. Not only do accounting tools contribute very largely to the performation of calculative agencies and modes of calculation, while allowing the constant reconfiguring of these agencies, they also contribute directly to the shaping of a discourse through which these agencies account for their action. A profit rate measures the result of the action calculated by a manager and when it is redefined it induces transformations of manager behaviour; it also provides the same manager with justification for his action vis-à-vis the shareholders.

Marketing, the history of which is recounted by Franck Cochoy in his contribution, has contributed powerfully to the setting up and deployment of the framing devices of calculative agencies. Take for example the concept of a marketing mix. As we know, this concept substitutes a quadruple reality—the fundamental 4Ps—for a product considered as an indivisible entity: a product is a Price, it is the object of a Promotion, it is a Place where it is available and, lastly, it is the target of a Product strategy. The product is therefore a multidimensional reality, an entanglement of properties that the marketing mix disentangles. The tool thus facilities a more detailed analysis of buying decisions, as well as the preferences which they express or reveal. The seller, instead of settling for a rough calculation, has an instrument which enables him, by varying each of the four dimensions, to distinguish in detail all the relations involved

and to calculate each one independently. The framing of decisions proves to be greatly enhanced, as it is by the use of econometrics mobilized by marketing management. The latter makes it possible to construct sub-populations of consumers and to link them to certain characteristics of products. And, thanks to econometrics, the analytical work is thus amplified, which helps to identify the more and more complex and differentiated causal links. When the concept of social marketing is introduced, a new step in increasing of the power of framing is taken. Marketing tools become capable of absorbing the actors and decisions which formerly defied them: those of the non-profit sector or even, in certain cases, the social protest movements themselves. By enhancing the inventory of relations and events to be taken into account, marketing tools promote calculations which constantly involve more and more elements and relations.

The formulation of these instruments which substantially increase the ability of producers and sellers to frame and internalize consumers and their preferences, helps to disrupt even trading practices. Like accounting tools, marketing tools perform the economy. Cochoy describes the tireless work done by the founding fathers of marketing and how they painfully recorded and then transported, formatted and compiled the concealed knowledge of practitioners; he also describes how this knowledge, once formalized and generalized, has been returned to these same practitioners through teaching. Marketing as a set of tools and practices taken from practitioners and reconfigured by 'academic' marketing specialists, fell, after numerous transformations and generalizations, on the head of the practitioners. This is how the progressive standardization of marketing people and the simultaneous constitution of the discipline of marketing can be explained. The same movement also establishes practices, particularly material ones, which have an impact on the consumers themselves. The consumer who, to calculate her preferences, distinguishes the four different dimensions behind the unity of a product (price, position, etc.), is the consequence of the marketing mix rather than the cause. Similarly, social marketing, by extending the spaces of calculability, contributes powerfully to the emergence of calculative agencies where they are least expected, ie in those areas where profit had till then been prohibited.

Is it not excessive to refer to economic theory when discussing the role of accounting tools or marketing management in the performation of calculative agencies? Obviously not. These instruments are

mediators between economics and economy. Not only are they responsible for the cross-relations between the two but, like any mediator, they actively promote the construction and constitution of each of them (on mediation see: Hennion, 1993). Without mediators like accounting tools and marketing management it would be impossible to distinguish between economics and an economy, just as it would be impossible to explain their interdependency. Moreover, the history of accounting tools features some of the greatest economists. They launch into battle dialoguing with practitioners, debating on the best way to determine and measure costs and at other times to define the calculative agent—a radical innovation—as a 'decision-making' agent. But accounting and marketing do not content themselves merely with providing economics and economists with access to the economy. They feed back to economics for, as Miller and Cochoy note, through all their collecting, comparing, generalising and integrating, these humble practitioners, simultaneously involved in several worlds and institutions, end up compiling an entire body of knowledge. Although hybrid, this knowledge is both original and very general. It is thus able to influence existing academic disciplines by mixing and combining them. By following this complicated history, we witness the birth and development of a *homo economicus* whose characteristics evolve and become increasingly complex. S/he inhabits two worlds simultaneously: that of economics (including, amongst others, disciplines and practices like accounting or marketing) with its manuals, and that of the economy with its organizations—two worlds which are stakeholders in one and the same adventure.

Among those mediators which bind economics to economy while constituting each as an independent entity, law, together with accounting metrology and marketing management, is well situated. Of course it provides a powerful tool for framing, or more precisely for enacting, calculative agencies[23] but what we wish to emphasize here is that it is an essential link, an irreplaceable coupling device between theoretical work and economic practices, for it organizes real experiments. The contribution by Hervé Dumez and Alain Jeunemaître provides convincing evidence. It shows that we can directly transpose onto social science in general and economics in particular the main results of the anthropology of science and techniques (AST) which has hitherto been concentrated primarily on the natural and life sciences. The cement industry is to competition theory what the drosophila is to genetic theory: a model which, owing to its crystal-clear simplicity, enables economists to ask some

fundamental questions and to evaluate the different possible solutions. As a true laboratory the cement industry has, over several decades, provided the material for testing a whole series of arguments on the effects of certain forms of pricing (such as the basing point system) or organization (such as vertical integration). On each of these points heated controversies have developed, involving eminent economists, professional syndicates, public administrations (FTC) and businessmen in complicated alliances. The by-products of these controversies have been numerous and diverse, for instance outstanding academic articles (eg, by J.M. Clark—who was involved in the debate on accounting techniques and on the notion of workable competition), administrative regulations and pricing systems. Some concepts in the controversy, such as that of market closure, when put to the test were shown to lack robustness and were rapidly rejected because unable to mobilize allies and satisfactory proof. Remarkably, throughout this history real experiments were organized: hypotheses have been put forward, measures—in all senses of the word—have been taken, and results have been evaluated. As in all experiments, the temporal dimension which leaves mechanisms the time to settle, has been essential. But these experiments have the peculiarity of taking place on a large scale, involving numerous actors while not being confined to a laboratory or research center. The numerous characteristics of this experimentation include the following:

- as AST came to admit for the natural sciences, there is no reason to imagine an end to these debates and controversies; no theory or concept can provide a final solution, simply because economic activities constantly spawn new problems, creating new overflowing. The frames which are conceived and enforced (for example the basing price system) to enable agents to calculate, are overflowed by new transport techniques which require new reflection and new solutions to restore calculability.
- experimentation closely links economics as a discipline and the economy as a thing. It would thus be meaningless to distinguish between an existing reality (economy) and the analytical discourse explaining it. Social science is no more outside the reality it studies than are the natural and life sciences. Like natural science, it actively participates in shaping the thing it describes. The cement industry provides a striking example. The agents engaged in the sector are not the only ones to play a role in its evolution. Above all, their strategies are not of their own making since these depend largely on the work of economists and civil servants who

intervene directly in the debates and the choice of procedures and regulations. The cement market is more like an unfinished building, an eternal work site which keeps changing and of which the plans and construction mobilize a multitude of actors participating in the development, by trial and error, of analytical tools, of rules of the game, of forms of organization and pricing principles. It would be wrong to distinguish in this overall construction—the practice of its own theory and the theory of its own practice—between the thing and the theory of the thing. This can be summed up in the following noteworthy phrase: economy is embedded not in society but in economics, provided one incorporates within economics all the knowledge and practices, so often denigrated, that make up for example accounting or marketing. Gao illustrates this very well with the famous Japanese model which, he shows, owes more to Schumpeter than to a hypothetical national tradition whose authenticity is constantly re-evaluated by the actors. We see why we have to be wary of the catch-all that socio-economics likes to use as a rallying cry: the market is socially constructed. What is under construction is precisely this heterogeneous collective, populated by calculating agencies. Society is not a starting point, a resource or a frame; it is, along with the market, the temporary outcome of a process in which social sciences—economics in this case—are the stakeholder.

- the knowledge produced by these experiments, the elements of economic theory formulated by the different protagonists, are not the fruit of efforts to abstract and theorize by specialists in the calm of their cabinets. They are collective achievements in which non-specialists (businessmen, civil servants, etc.) play an essential role. Thus, the social field in which economic theory is produced resembles the hybrid forums Callon refers to in his chapter, hybrid forums in which non-experts actively participate in debates, tests and attempts at interpretation—in short, in experimentation and collective learning.[24]

This performation of the calculative agencies—ie, of the economy by economics—is largely carried out through the intervention of professional economists. The study of the strategies developed by this profession is thus indispensable for an understanding of the variety of mediations through which this gigantic enterprise of formatting takes place. Unfortunately very few studies exist on the subject.

The classical study by McCloskey on the rhetoric of economics is nevertheless worth mentioning, although its definition of rhetoric remains so classical that it is obviously limited (McCloskey, 1985, 1990). As the sociology of science has shown, we cannot detach rhetoric, its forms and effects, from the controversies, theoretical or political, in which the protagonists are engaged. Dumez and Jeunemaître illustrate this point so well. For an economist, convincing a colleague during a conference organized by a scientific association is a Pyrrhic victory if he can not convince an FTC commission or a court. Rhetoric, defined as the art of building alliances to establish a favourable balance of power whether in science or politics, cannot be reduced to an excess of mathematization or generalizing abstraction intended to terrorize the opponent. Mathematics has never terrorized anyone but those who have let themselves be terrorized by it! On the other hand, the infinitely more classical and simple rhetoric of Fetter in his struggle against the basing price system, is formidably effective. He denounces his opponents by accusing them of being bought off by the cement producers, and therefore of blindly defending their interests. At the same time he presents himself as a 'mere theorist' out only to defend the general interest: 'my interest in this or any other subject of this kind is imply the same as any citizen would have'. There is no need for equations or abstract concepts to reduce the opponent to silence; one need only manipulate interests, promote collusion and become the spokesperson of the general will. What good, true rhetoric it is, that becomes fully meaningful and significant only when attached to the debates and controversies in which the actors—in this case the economists with their arguments and counter-arguments, their theories and counter-theories—are involved.

In the construction of trials of strength which enable certain arguments and tools and, thus, certain ways of framing calculative agencies to triumph—and consequently economics to perform the economy, the dissemination of students trained in economics is of prime importance. These actors become the partners and intermediaries enabling economic theory to dialogue with practitioners and thus to shape them (Fligstein emphasizes, for example, the role of former economics students in business (Fligstein, 1990)).

More generally, the strength of economics derives largely from its heterogeneity and the fact that it is constantly the scene of conflict and internal debate. There is probably not a single theoretical argument defended by any economist, which has not been severely

criticized by another economist. This internal diversity endows economics with an amazing ability to respond, adjust and react (Lebaron, 1997). This ability seems even greater when we remember that the economists' profession constitutes a whole spectrum from the 'purest' theoreticians to the specialists closest to the business world. Everything is set up so that these incessant movements through which economics and the economy inform and perform each other might be produced.

Economization

In our initial definition of the market, we indicated the prime importance of the existence and hence the formatting of calculative agencies. Without them no market transactions are possible. But, as we have seen, the market, although it needs calculative agencies, is also characterized by multiple forms of organization. Several types of organized market exist, depending in particular on the nature of the calculations of the calculative agencies. There are countless ways of calculating and we have already noted the diversity of their modalities, explicable to a large extent by the tools used and the frames created. A market in which the agencies are, for example, reluctant to introduce time equivalence, to consider products as homogeneous entities and to exclude from their calculation the possibility of vertical integration, is profoundly different from a market in which all these operations are technically possible. Another important variable is the number and the distribution of calculative agencies.

Finally, the market is a process in which the calculative agencies compete and/or co-operate with one another. This simply means that once framed, each agency is able to integrate the already framed calculations of the other agencies into its own calculations. It is these cross-related calculations that contribute to defining the market as a dynamic process.

The examination of these two dimensions (the organization and the process) alone warrants far more attention. I shall however confine myself here to a few considerations intended solely to clarify the subject of this book. First, I shall consider the question of the extension of the market, examining in turn the problem of the merchandization of goods and of state-market relations. Secondly, I shall consider competition as a confrontation between agencies endowed with calculating tools of differing levels of efficiency.

Extension of the market

Modernity is considered by some to be the twofold rise in importance of technosciences and the market. The fall of the Berlin Wall, the striking growth of the NICs and the rising pre-eminence of finance markets, in short, what is generally called globalization, seem to provide unquestionable proof of this inoxerable destiny. According to these commentators, and contrary to what Polanyi argued in *The Great Transformation*, the global market society is marching on. Archaic cultures and traditional societies are disappearing in the face of the unavoidable ascendancy of the modern world.

This extreme view does of course have its detractors who deny the very existence of such globalization (Fligstein, forthcoming), (Callon and Cohendet, 1997) and emphasize the composite, heterogeneous nature of the economies being established and becoming more closely linked to one another (Appadurai, 1996).

Beyond this debate, and even before proposing elements of an answer to the questions underlying it, it may be useful to revert to what must be the anthropological starting point of this reflection: how, if at all, does the proliferation and dissemination of calculative agencies work? In other words, is it feasible to conceive of a disentangling process which, through being deepened and generalized, ends up creating this community of strangers and strangers only, the sociological possibility of which Polyani vehemently denied?

To reply theoretically to this theoretical question, it is best to start with examples. The contribution by Viviana Zelizer provides the most striking and definitive one. We are all familiar with the attacks by Marx and Simmel against money and their denunciation of its destructive and alienating power. Marx saw money as the fetish *par excellence* of the modern world; one that concealed the reality of relationships between the people that lay behind relationships between things. In his famous text on the philosophy of money, Simmel took over where he had left off. Money dissolves social ties, founds a society based on pure rationality and kills personal relationships; responsible for the foreignness between agents, it seals the triumph of *gesellschaft* over *gemeinschaft*. The depersonalizing power of money seems even stronger and more implacable with the constant struggle, since the beginning of the century, of public authorities to oust private and false currencies and to guarantee the universality of an official one. This struggle seems easily won. Money is one of the goods without any usage value since its

main function is to provide equivalence. Does this simple property, which enables it to circulate without being set anywhere and to be indefinitely substitutable, not make disentanglement easier?

Disentangling a service relation, the realization of which frequently requires the effective co-presence of the supplier and the consumer, is obviously a brain-teaser. The interpersonal links, the attachment, are so to speak inscribed in the service relation, so that the framing is costly, necessitating very specific equipment. On the other hand framing money, that is to say disentangling it, seems to require little effort since money is by construction already framed: cold, circulating, constantly changing hands, going from account to account. Yet for a long time anthropologists have tried to show that this is not so. Money, contrary to widespread belief, is constantly diverted and thus re-entangled. For example, French money in New Caledonia may be treated in exactly the same way as the shells used in ritual exchange (Bensa and Freyss, 1994); or the monetary debts between bikers can be seen as the basis of highly complex personal relations (Portet, 1994). In the nineteenth century in the Landes in France, the various currencies in circulation were so similar that the craftsman who produced his own coins was not really considered in the village to be a forger (Traimond, 1994). Currencies are continually being reinvented at a local, private level. But the true demonstration of the impossible disentanglement of money is given by Zelizer who raises the only question that counts: can one give a gift in money? Or put another way: can one organize overflowing and multiply ties with money, that epitome of framing and forcing out? The answer is yes, and Zelizer multiplies the examples showing the generality and universality of this reply.

At the center of the constantly renewed, never failing resistance of money to disentanglement, lies a crucial practice: that of earmarking. This capital concept provides us with the key to understanding entanglement.

Money, whatever its degree of abstraction and dematerialization, by the mere fact that it circulates and that its circulation is calculated by agencies engaged in transactions, leaves traces: those of its successive attachments, the points through which it passed, the agents in whose hands it landed at a given moment, only to move on again. When the money is a material object—a bank note, metal coin or shell—these traces merge with the different positions occupied by the object itself as it circulates from hand to hand—positions which describe a trajectory a little like tracer bullets used by soldiers in training. When it is plastic money, these traces are

attached like a wake to the card in the form of receipts, bank records, and so on. Finally, when it is reduced to transactions and operations directly between two bank accounts, these traces are recorded on long listings—inscribed in ink or in the silicon chip—which provide the identities of the beneficiaries and issuers next to the amounts involved. Money has no use value, but it is a trail, a wake, a visible, materializable, traceable trajectory.

This means that money, as an operator of equivalence, cannot be dissociated from its trajectory or at least from a part of it; in other words, from its spaces of circulation.[25] If the trajectory were not legible, money would lose its quality as money. Total disorder would settle in since, being able to identify neither issuers nor receivers, agencies would be unable to do accounts, make transfers, impute profits and losses, and so on. It is precisely because money can not exist as a currency without the inscriptions telling us who used it, and when, that makes entanglement not only possible but even probable. Earmarking denotes all the practices through which agents particularize these inscriptions, by fixing trajectories, assigning movements, and simultaneously embedding money in a specific space of circulation, ie, by attaching it to certain issuers and beneficiaries.

In its most simple form earmarking consists of overloading bank notes, which in themselves are already saturated with inscriptions describing their official attachments, with new, private, messages. This practice, the object of interesting analyses,[26] is facilitated by the fact that the bank note is an excellent medium for the exercise of rewriting. Zelizer goes beyond these known practices and shows the variety, multiplicity and, in fact, universality of these strategies of re-inscription or earmarking which characterize trajectories and privatize money. For open lists of positions—which means that money is attached to none of them since it can occupy them all—earmarking substitutes closed, bounded lists which force it to pass through certain points. Earmarking is deployed as much in the domestic sphere, with silver coins which a grandmother gifts to her grandchildren to put in their piggybanks in memory of her, as in systems of mass distribution, with vouchers, fidelity or credit cards and other such devices. Zelizer's conclusion is altogether logical when she exposes the misinterpretation popularized by Marx and Simmel. What she shows without difficulty is that advanced societies proliferate earmarking and differentiation: 'To the extent that it (money) does become more prominent in social life, people will segregate, differentiate, label, decorate, and particularize it to meet

their complex social needs'. The fact that there are goods which are widely available without any particular attachments opens paradoxically the possibility of an endless process of earmarking.

We note in passing that in certain cases the process follows the inverse path consisting of departicularizing a currency entangled in its networks of circulation and bearing the marks of the attachments binding it. This is what happens with the laundering of money earned through illegal activities such as those developed by Mafia networks. This laundering, as the word suggests, consists of erasing all traces so as to make the reconstitution of singular trajectories impossible. It is, however, as difficult for a financier to launder money as it was for Lady Macbeth to remove the spot of blood which incriminated her in the murder she committed; it requires specialized know-how and heavy investments, particularly in coding. The laundering, that is to say the disentanglement, of money is never complete because it remains possible to reconstitute lists even if they have errors or are incomplete. The affair of gold deposited by Jews in Swiss banks proves that when ordered to do so, it is possible to find the origin of the deposits and to publish the list (even if riddled with mistakes) of depositors.

The fact that the possibility or even the necessity of its entanglement is built into money, and that real money is consequently a variable compromise between entanglement and disentanglement, leads us to predict that the same process can, *a fortiori*, be observed for any other good.

A demonstration would be easy, given the number of studies supporting this argument. The case of organs is interesting because it is symmetrical to that of money. How is it possible to circulate a liver, a kidney or a heart, between a donor—generally dead—and a recipient—generally in danger of death—when the organ is entangled in the body of a potential donor and through him in his family or circle of friends? The transfer of the organ is a forcing out in the true sense of the term; its success depends on that of disentanglement. The difficulty of this disentanglement explains why the transfer is most often in the form of a gift which, as we have seen, reconciles circulation and entanglement. However, in some countries we witness what Fox calls a process of 'degifting', that is to say, a concerted and systematic attempt to disentangle organs so as to transform them into something which makes them more like goods than gifts (Fox and Swazey, 1992). It is at this cost—that of a successful forcing out—that a true organ market becomes possible, even if this market does not necessarily mean the formulation of

prices. But how can an organ be definitively disentangled? The question is interesting because it is symmetrical to that proposed in respect of money: how does one entangle money?

Hoyle provides valuable elements of an answer (Hoyle, 1994). Faced with the increasing demand for transplants, an attempt is made to organize a market in which the organs that circulate are not only of high quality but may also be used by any recipient (barring immunological incompatibility). In short, the organ has to be transformed into a good free of all attachments. The procedure to frame the organ and thus disentangle it, requires the constitution of a file on the donor. For this purpose a standardized form is filled out, where all relevant information is noted (circumstances of death, medical history, family context). A file is thus constituted in relation to the organ for the purpose of transforming it into a half-good. This file reviews the relations in which the organ was entangled before the death of the potential donor. It is, however, in this file intended for disentanglement and through it, that the forces of re-entanglement—and this is the paradox—are freed and exhibited. The co-ordinators responsible for the file, for framing the organ by listing all the relations that have to be taken into account in the decision to transplant, are required in carrying out their work to interact with the donor's friends and family. They may also have to interact with the medical providers who cared of the donor during the last minutes of her life. They will thus gradually build up a 'narrative' which will enrich and complicate the form, adding new layers of interpretation, transforming into a thick description what should only have been a cold statement. Because nothing eludes the investigation—a human life is a ball of entangled threads: drugs, alcoholism, sexuality, which are difficult to unravel—the co-ordinators end up becoming tangled in the biography of the donor. The lesson is clear: the more investments increase to disentangle the organ and frame it by listing the relations that attach it to the donor—the better to detach it—the more the ties proliferate and multiply. This dynamic is in no way abstract, it is inscribed in the heart of the framing process and is its obvious outcome. Here, as in the case of money, it is spawned by a long process of inscriptions and re-inscriptions.

These two symmetrical examples amply serve our demonstration.[27] They suggest the following conclusion: the disentanglement which in its material realization implies the establishment of lists of positions and relations that, once established, allow calculation, opens the way to entanglement. This generalizes the argument

defended by Callon in this book: framing requires the mobilization of entities, while their irreducible autonomy is a source of new overflowing.

Zelizer helps us to evaluate the inappropriateness of the reasoning usually employed to demonstrate the impossible generalization of the market. It is not traditional society which resists the market; it is not values which serve as a bastion to the infinite extension of calculation; it is not the necessary development of relations of trust at the heart of the market which sets the limits of the market. The mechanics are both simpler and more fundamental. Any framing produces overflowing, and any procedure of disentanglement produces new attachments. It is one and the same movement which causes calculative agencies to proliferate, while reinscribing them into spaces of non-calculability. The fact that these spaces—of calculability and of non-calculability—are organized in impervious spheres as in the political philosophy proposed by Michael Walzer, is neither necessary nor evident (Walzer, 1983). The economy is not a universe whose expansion is contained by other universes.

The idea that there exist orders of reality, social spaces organized according to incommensurable and antagonistic logics, is amusingly illustrated by Maupassant in a short story called *Le condamné à mort* (de Maupassant, 1987). Having sentenced a man to death, the Monacan state, possessing neither an executioner nor a guillotine, turned to the French state to sub-contract the execution. However, the Monacan authorities shrank back at the price: 'Sixteen thousand francs for a rascal! Oh no', and decided not to execute the sentence but rather to commute it to life imprisonment. But the cost of constructing the prison and maintaining the prisoner again seemed exorbitant. The state therefore offered the prisoner 'freedom' on the condition he be exiled. The prisoner, guessing the strength of his position, refused. 'So it was decided to offer the prisoner a rent of six hundred francs to go and live abroad. He accepted'. Since each party's interests were served in the compromise, all was well that ended well. Maupassant showed, through the absurd and the comical, that the order of the courts cannot rely on market calculation. He thus anticipated Walzer thesis and, indeed, of all those who maintain that the social link cannot be reduced to the market, that society is made of spheres or institutions, and that each one serves as a bastion against the expansion of the others. However charming the short story may be, it comes up against the same difficulty as the explanation proposed by Walzer. How can the existence of the separated areas of non-calculatability be explained? The hypothesis of

independent spheres or that of 'incompatible' logics (DiMaggio, 1994) leaves the question of the emergence and formatting of non-calculative or calculative agencies untouched.[28] This is reassuring but explains nothing and ends up, moreover, causing concern: what institutional barriers are strong enough to contain the forces of a market which, although enclosed in its own sphere, is supposed to exist in its purest form? Won't the Monacan state (followed by many others) finish by choosing the market contract as the most convenient solution?

This concern disappears when we agree that the opposing forces are created in the same movement and that they are disseminated, that all framing creates overflowing, and that all disentanglement provides the opportunity for new entanglement. To understand the differentiation there is no need to explain it by the spheres or logics which mutually limit its expansion. Differentiation is spawned by a single recurring process. Simmel, in his own way, saw that irreducible ambivalence: 'Innumerable times (competition) achieves what usually only love can do: the divination of the innermost wishes of the other, even before he himself becomes aware of them,' (Simmel, {1908}, 1955).

The anthropological solution proposed, which has the advantage of being extremely simple, also allows us easily to account for an observation repeated so often: there is no Great Divide between societies populated by calculative agencies and societies in which the agents do not calculate. Even Deleuze and Guattari were on the wrong track with their concept of deterritorialization, that extraordinary faculty bestowed on capitalism for breaking all ties and undoing solidarity (Deleuze and Guattari, 1972). So-called traditional societies are populated—sometimes even over-populated—with calculative agencies. Thomas' entire book consists of a long and detailed demonstration of the impossibility, in Melanesian societies, of separating a gift economy and a market economy since the two are entangled right to the heart of the Kula. Strathern, with her analysis of so-called compensation mechanisms in highlander societies in New Guinea, reaches exactly the same conclusions: the highlanders spend their time calculating and establishing equivalences (Strathern, forthcoming). This explains their amazing faculty for understanding the theme of biodiversity and for taking part in scholastic debates on Intellectual Property Rights. When collecting rare species in New Guinea, multinationals encounter peoples who are more used than they are to framing, calculating and playing on the formal abstraction of property rights. These are conceived, and

Strathern stresses this point, not in the traditional perspective of Roman law (which implies that thing is physically shared between its different owners) but from a viewpoint of common law which associates, in an abstract way, a thing with a bundle of rights that can easily be distributed between several agents, making easier sophisticated calculations.

As for so-called modern societies, they are endowed with as many non-calculative agencies as calculative ones. This inextricable mixture can be found where we least expect it: at the very heart of financial institutions.[29] Abolafia shows us traders obsessed by networking, multiplying entanglements to put themselves in a position to calculate. Moreover, in our modern societies technosciences add their peculiar capacity for amplification, to the general movement in which entanglement arises from disentanglement. As Callon recalls in his chapter, technosciences multiply unexpected connections and overflowing, constantly making the work of reframing more necessary, more difficult, more expensive and more uncertain. Like Sisyphus in his futile attempt to push a boulder to the top of a hill, they continuously find themselves back at square one. Finance and technoscience form an alliance to open the way to the forces of entanglement.

The advantage of this anthropology of entanglement is that it frees us from the irritating and sterile distinctions between state and market, or between global economy and national economies.

How can relations between these two entities, the state and the market, politics and economics, be described? Block suggests the distinction between two paradigms (Block, 1994). In the first one the state and the market are considered to be two analytically separable realities, placed at the two ends of a continuum. A particular form of economy can be defined as mixed, a combination of two pure types. This paradigm has, to a large extent, proved to lack realism both historically and theoretically. The state does not intervene in the market; according to the second paradigm it participates—and its role is always essential—in the constitution of the economy. A way of showing this is to provide a list, obviously partial and purely indicative, of these constituent activities: rules governing the use of productive assets, legal frameworks governing recurring relations such as those between employers and employees, means of payment, managing the boundary with the rest of the world. It is easy to verify that each of these activities contributes directly to the framing of calculative agencies. They do not organize the actions and economic behaviours which already exist, outside of state

action; they format these actions. Could we say that the waffle exists independently of the waffle-iron? Of course not. Similarly, we cannot say of an organized market activity that it exists without the state. The true question concerning the state is this: how and with what methods and efficiency does it contribute to the performation of calculative agencies and the organization of their relations? This simple question shows the existence of a wide range of possible contributions; a range which is as wide as that of forms of market organization. Before rushing for definitive classifications,[30] it seems wiser and more fruitful to make detailed individual case studies of observable configurations (Dobbin, 1994). The reconstruction in East European countries and China constitute, from this point of view, valuable laboratories and experiments from which Stark draws some conclusions. That the term transitional economy could be used in their case shows the weight of the old paradigm, and the extent to which market mechanisms are misunderstood, even among economists. There is nothing of a transition in the developments observed nor in their diversity which mark an extreme contrast between countries such as Poland, Hungary, Bulgaria or China (Nee, 1996). In each case reconfigurations, recombinations and rearrangements are at play and mix material peculiar to the history of each country. In these rearrangements the state often plays a crucial part and the dynamics in place impact, in turn, on its own position and contribution to the economy. Stark clearly shows that these recombinations have the effect of remodelling the calculative agencies and their relations. Based on a study of the process of redistribution of property rights and its networking effects, and after a detailed statistical analysis, he easily shows that the resulting type of organization, which he aptly calls recombinant property, is built on a threefold process of blurring: blurring of public and private, blurring of firms' boundaries, and blurring of the boundedness of legitimation principles. The mixed Hungarian economy, that of the second half of the 1990s, which recombines and blurs, certainly has a limited lifespan. This is a transitory economy, mixed like any economy, but not a transitional one. It corresponds to a stage on a singular trajectory; it was shaped by framings, related to state action in particular, which produce a unique situation in which losses are socialized and profits privatized.

That the state constitutes, rather than intervenes in, the economy, leads us to relativize the thesis of globalization which is, moreover, a subject of heated debate among economists. Fligstein shows convincingly that this worldwide extension of the market may simply be

interpreted as the growing domination of a form of organized market, that of the United States, over other forms of organization (Fligstein, 1996). The organized American market favours the conception that the only people who have the right to inspect the activities of a firm are the shareholders, and the only preoccupation of firms must be to maximize the shareholder-value. That this form of domination is only partial and is constantly opposed, is a direct result of what has just been said on the constituent role of the state in economic life. The phenomena of path dependency recalled by Stark are so strong that there is no reason for the States of the dominated economies to align themselves with the role of the American state in the American economy. But other factors explain the existence of limits to any domination of any form of organization, whatever may be. The analysis of the Japanese economy by Gao shows this. A particular form of organized market (which obviously includes the public policies contributing to its constitution), although well-suited to solving certain problems and supporting certain forms of calculated action, may prove to be particularly ineffective when the circumstances change. The American model is efficient when situations are unstable, owing notably to the sophistication of financial techniques and the quick short-term calculations they allow. But when the significance (scope) of change increases and the actions to be undertaken have a more long-term perspective, other types of market and other calculating tools may be required.

Competition

The organized market cannot be reduced to a mere system of trade and transaction. It is also, above all, a process in which agents who design and produce goods enter into competition to capture a demand which they help to (re)define.

Max Weber is certainly among those who has grasped this agonistic dimension of the market most fully:

> A market may be said to exist wherever there is a competition even if only unilateral, for opportunities of exchange among a plurality of potential parties. Their physical assemblage in one place, as in the local market square, the fair (the 'long distance' market) or the exchange (the merchant's market), only constitutes the most constant kind of market formation. It is, however, only this physical assemblage which allows the full emergence of the

market's most distinctive feature, viz, dickering (Weber, {1922} 1978 quoted in: Swedberg, 1994).

This definition is reflected in our theory of the formatting of calculative agencies, and in the significance granted by it to material and metrological equipment. It has, moreover, the merit of recalling that the market is a pacific arena in which agents enter into competition with one another to secure positions of monopoly and domination. This tradition in which the market is a competitive process and device has obviously been developed by the neo-Austrian school and is illustrated in the work of authors such as Chamberlin, Schumpeter and Galbraith. Let me not be misunderstood. It is not enough to talk of imperfect competition to do justice to this dimension of the market. We have to go—as Chamberlin, among others, dared to—so far as to agree to consider that one of the weapons of competition, in fact its main weapon, is precisely for an economic agent to refuse disentanglement—that process which frees actors and produces agencies free of commitments—so that it can, by contrast, produce entanglement. Any self-respecting economic agent reweaves again during the night the framework undone by the market during the day.

Chamberlin put it marvellously in his definition of imperfect competition: 'It is to be recognized that the whole is not a single market, but a network of related markets, one for each seller' (Chamberlin, 1933, p.69). Schumpeter repeats the same lesson when he defines the entrepreneur—in a perspective similar to that of social networks—as the one who unexpectedly connects two hitherto unrelated populations of agents: on the one hand the engineers or researchers who work on the design and creation of new goods and, on the other, the customers and consumers who express a demand related to these goods.

This enables us to surpass Weber's indications, without rejecting them. The market is not a two-step process with a competition phase followed by an exchange phase. The type of representation puts the creation process of products and demand for these products in parenthesis, a process which we know involves a web of close connections between designers, producers, distributors and consumers. Preparing the final transaction, that is to say, capturing a customer and engaging her in an exchange from which each party leaves as a stranger involves—and this is obviously one of the paradoxes that has to be noted—a long process of networking.

It is to the understanding of this counter-intuitive mechanism (in

order to prepare the market relationship, it is first necessary to relate, connect and associate) that Patrick McGuire and Mark Granovetter's chapter provides a powerful contribution. Their aim is to follow the early evolution of the electricity industry. Each decision on which the structure of the fledgling market will depend, the content of the goods offered and the modalities of competition are all analysed simply in terms of connections and networking. Whether it concerns the choice between central stations and isolated systems, between AC and DC or between 25 and 60 cycles, the same logic is always present, that of existing networks into which the industry fits and which, in turn, it rearranges. The agents who manage to occupy key positions draw the boundaries of competition, eliminate competitors, select technologies and thus capture the demand. We witness the creation of what ANT (Actor-Network Theory) called a socio-technical network which, by dint of exclusion, managed to organize highly regulated competition allowing a few agents to derive sustainable profits. In this struggle—in which the structure of the industry, the forms of competition and the technologies were shaped simultaneously—anything goes when it comes to strengthening ties: creation of professional associations, enrolment of the trade press, leadership of occupational or professional clubs, corporate welfare and employee clubs, lobbying the public authorities and even—ANT prepared us for this—the constitution of a collective laboratory which imposes technical standards for the production of lamps. We cannot show more clearly that the very nature of competition is to rarefy competition. One can refer here to the work of Burt ('the substantive richness of competition lies in its imperfection') and the subtle analysis of firms niche strategies by White (White, 1981, 1988). Defining imperfect competition by comparing it to a model of perfect competition (as for example in neoclassical theory), is totally justifiable when we view economics as a device intended to perform the economy, that is to say, to establish calculative agencies detached from one another. However, this position is misleading when our aim is to construct an anthropology of the markets. What McGuire and Granovetter show, in the case of electricity although there is no reason not to believe in the generality of the statement, is that perfect or imperfect competition—defined as a situation in which 'a set of firms produce the same or related products'—can emerge only in a highly structured industry. The more or less imperfect competition prevailing in organized markets is a latecomer in a long-lasting process. Competition, whether perfect or imperfect, is not a starting point but a finishing

point. It can exist and really does exist—and that is what makes it so valuable. However, it occurs only when the boundaries, the technical options, have been selected and stabilized, ie in a world that is already highly structured and shaped. Now—and this is where McGuire and Granovetter are so important—this structuring is the last step in a long process dominated from the beginning to the end by rivalry between calculative agencies.

How are the dynamics of this rivalry to be described? Why are certain calculative agencies able to impose the events, actions and relations that other calculative agencies have to take into account in making their decision? One answer is that the power and modalities of calculation are not equally distributed among all the agencies: there is no reason why the metrological instruments and equipment available to each one should be identical. The calculative power of an agency depends on that of its calculating tools. These are characterized above all by the number and variety of relations and agents which they are able to take into account.[31] We showed this for accounting tools and marketing management: a tool which breaks down the unity of the product, which integrates the preferences of diverse sub-populations of consumers, and which takes into account the quality of the service provided, the volume of stocks and the changes of opinion in favour of or against a particular controversial technology, is more likely to result in successful actions. The more an agency is able to complicate and broaden the network of entities and relations to be taken into account, the greater is its capacity to create asymmetries between itself and other agencies. Competition between calculative agencies, focused on their ability to have their decisions recognized and accepted (for example to propose a given product on a given market segment), is largely determined by the respective qualities of the calculating devices. The probability of gain is on the side of the agency with the greatest powers of calculation, that is to say, whose tools enable it to perform, to make visible and to take into account the greatest number of relations and entities.

The struggle between two agencies is therefore rarely equal; it is reminiscent of the match between Kasparov and the IBM Deeper Blue. Calculative agencies engage in power struggles which are measured by the tools with which they are equipped. In certain cases these power struggles may lead to a situation of dependency. The most obvious form of this dependency corresponds to the 'parasiting' of one calculative agency by another which imposes (a part of) its calculation tools and rules, and consequently forces the host

agency to engage in its own calculation. It is almost as if Kasparov—and this is not far from what happened—had to start calculating his moves not by playing like Kasparov but by imagining himself in the computer's position, that is to say, by borrowing from it its algorithms and calculation rules. The game would then no longer be between Kasparov, an autonomous and independent agency, a player in his own right formulating his own strategies, and the computer, also an independent and autonomous agent. It would be a game in which Kasparov was transformed into an appendix, a mere branch of the computer, as if the latter had delegated the execution of a part of its own calculation to the former. Engaging in one's opponent's game by entering into his calculating power means accepting dependency.

This type of situation is frequent in economy. Imposing the rules of the game, that is to say, the rules used to calculate decisions, by imposing the tools in which these rules are incorporated, is the starting point of relationships of domination which allow certain calculating agencies to decide on the location and distribution of surpluses. That is how the predominance of some forms of organization—for example the American form—is explained. The extension of a certain form of organized market, an extension which ensures the domination of agents who calculate according to the prevailing rules of that particular market, always corresponds to the imposition of certain calculating tools.

Market laws

As we reach the end of this long detour it is time to return to the original question.

By ridding ourselves of the cumbersome distinction between economics (as a discipline) and the economy (as a thing) and showing the role of the former in the formatting of markets, we find ourselves free from a positivist or, worse still, a constructivist conception of law. Market laws are neither in the nature of humans and societies—waiting for the scientist, like a prince charming, to wake and reveal them—nor are they constructions or artefacts invented by social sciences in an effort to improvise simple frameworks for explaining an opaque and complex reality. They account for regularities progressively enforced by the joint movement of the economy and economics, a movement that we have attempted to describe in this introduction. These regularities perform behaviours

and therefore have the obduracy of the real; yet in turn they are performed by these behaviours and therefore have the contingency of an artefact.

These regularities, related to the stabilization of particular forms of organization of market relations, remain limited in time and space. It is therefore wrong to talk of laws or, worse still, of the law of the market. There exist only temporary, changing laws associated with specific markets.

The examples of the Hungarian and Japanese economies perfectly illustrate this point. Each of these economies is a particular historical and contingent—yet perfectly explicable—form of market organization. There is no other way of describing the Hungarian economy than that proposed by Stark: 'Parallel to the decentralized reorganization of assets . . . the centralized management of liabilities'. This arrangement shapes a network of assets and liabilities as well as a network of calculating agencies which develop hedging strategies.[32] These strategies in turn contribute to the emergence of regularities which, by allowing calculations and what economists would call expectations, lead to their own reinforcement. Not only are these regularities local and genuinely Hungarian, what is more, no general underlying or meta law—for example, a presumed optimizing behaviour of agents, whether Hungarian or Persian—can account for it. This is because the behaviour of the agents and their calculations are so embedded in the local reality that the mere transposition of financial tools imported without any other process leads straight to economic and political collapse. Gao confirms this absence of a founding, underlying law which, in its fine simplicity, would explain the diversity of forms and organizations. There exists no infrastructure which as a last resort might explain the social order. In the cosmos of the Japanese archipelago, in the space of a few decades, the laws governing the economy have changed completely. No simple explanation—and it is on this point that the demonstration revolves—can account for this phenomenon. The market laws of the first period, laws which themselves were local and historical, can at a pinch be considered as the driving forces behind the change, without however explaining the content of this change. The economic agents of the first period calculated their decisions, but in so doing they did not engender the market of the second period. We can see here the significance of the thesis of variability of forms of calculation and calculative agencies. It is not enough to have calculative agencies to explain a given evolution. The reason is simple: calculation can not take into account all the

relations and actions since it exists only when framed, that is to say, closed off to overflowing which it tolerates and which acts obscurely, so contributing to the emergence of an unexpected reality. We cannot explain one form of market by another; however, what we do explain without anthropology is how we shift from a certain formatting of calculative agencies to another.

This point of view is at one with the old and sound intuition of anthropology supported by Sahlins among others (Sahlins, 1976) and recalled in this respect by Abolafia: rationality is always situated and the anthropologist strives to explore decision-making in natural settings. It is also akin to the classical analysis of Polanyi and his classification of economic institutions (reciprocity, redistribution, market). But beyond these (too) general classifications and *petitio principii*, the anthropology that we have proposed has the immense advantage of opening the field to empirical studies in order to reconstruct the diversity of formatting.

The recognition of the existence of local and transitory regularities is not unrelated to one of the mechanisms carefully studied by economic theory: that of lock-in and path dependency (David, 1984). Lock-in denotes all the mechanisms through which the evolution of a market or an institution becomes more and more irreversible. The choices and decisions made during the first period play a part in limiting the range of possible choices and decisions during the second period. Progressively the range of possible options narrows down, closes and locks, so that the agents have no alternative but to renew the choices made earlier. They are prisoners, trapped in networks from which they have neither the resources nor the desire to escape; they are submerged in the very structures they helped to set up. The role of technology in the construction of these interdependancies, these cases of lock-in, is capital. The simple decision to invest in a given technology sets off a dynamic of learning and accumulation which rapidly leads to unequal development. The chosen technology becomes increasingly attractive and profitable, not by virtue of its intrinsic qualities, but because substantial investments have been devoted to its improvement. This theory of lock-in has been the subject of an abundant literature, aimed in particular at accounting for the permanently open possibility of lock-out.

The notion of lock-in is rich but ambiguous; ambiguous because it takes as a reference the model of the flexibility of decisions and the openness of choices and scope of action. Lock-in is a deteriorated form of the market yet, as we have already mentioned, from an anthropological point of view the opposite is true. Organization of

the market and the openness of choices vary inversely. McGuire and Granovetter show that the opening of options, particularly technical, is maximal at the outset when the market does not yet exist or, rather, is at its zero degree of organization. This opening, an outcome of the non-existence of the market, is situated not at the level of the agents but at the level of a virtual collective. Some agents opt for decentralized systems, others continue to fight for gas and yet others are keen on direct current, but each one sticks to his own course. To reconstitute the options as alternative ones, we need to imagine a social planner gathering all the relevant information and embarking on opportunity calculations. We thus get a glimpse of one of the possible reasons to justify planned economies: they are the only ones to make concurrent decisions comparable and calculable, at least on paper, when the options are still open. It is only when certain options have been eliminated and that the range of options has been drastically reduced, that the market is finally organized (firms are similarly structured, occupational categories are standardized and extra-organizational structures are created to manage competition and articulate common goals), and that individual agents can calculate the comparative merits of the options which remain open. Lock-in is not a deteriorated form of the market, it is its compulsory companion, a necessary symptom of it. However, the lock-in in question and the interdependancies it implies should not be likened to the abstract lock-in of North which reduces it to the mere institutional rigidification of initial game rules (North, 1990), or even to the more material lock-in of David who took into account the role of technology. It is deployed and unfolds in heterogeneous arrangements (which are solid because heterogeneous) where one finds, knit together—McGuire and Granovetter provide their quasi-exhaustive inventory—not only technology but also forms of organization and governance, relations between firms and public authorities, both local and national, associations and clubs, research centres, bribes, accommodating journalists, and so on.

It is thus under the condition of a double reversal that the notion of lock-in manifests its richness. Firstly lock-in is not the progressively deteriorated form of perfect flexibility; it is, on the contrary, the condition of a manageable flexibility which, if it exists, can only be limited. Secondly lock-in consists of a hetereogeneous arrangement which frames the calculative agencies against a background of visible interdependancies. It is thus as varied and multiple as the forms of market organization.

Once organized and hence locked-in, the market becomes calculable by the agents. Once the work of standardization (at least partial) of calculating tools is well on its way, each agency is in a position not only to calculate her decision but also, by construction, to include, at least partially, in her calculations the calculations of the other agencies. This integration, which is the material side of what we call anticipation, is far easier when, during the process of market organization, a calculative agency manages to impose directly her instruments and mode of calculation (here, the anticipation is perfectly rational because each agency makes the same calculations and follows the same procedures). In this case the calculated decisions produce the anticipated effects, aside from opportunistic behaviour, which is another way of saying that the market considered obeys certain laws which may be formulated in mathematical language. If mathematical economics can be realistic under certain conditions, it is not because human behaviour is naturally 'mathematizable"; it is because the calculative agencies are there to introduce interrelated calculations in decisions and in the formulation of actions.[33]

For an anthropology of markets

With this theory of the formatting of calculative agents we also avoid another difficulty, that of the impossible choice between the denunciation and the celebration of the market. This concerns social sciences to the highest degree. We have seen the positive and performative role of economics and its contribution to organizing markets. Sociology is implicated as well on the condition it avoids two pitfalls. The first corresponds to a strategy of enriching the economic theory of the agent. Economic sociology has rarely been able to resist this temptation. Underscoring the complexity of economic phenomena, a complexity to which economic theory with its cold and disincarnated view of *homo economicus* cannot do justice, sociology strives to give this abstract agent a bit more soul—the life and warmth he lacks—by mobilizing notions such as those of value, culture, rules or passions. Pareto dreamed it, economic sociology makes it. Yet, as we suggested, economic agents do not need be enriched. If they manage to become richer it is because, on the contrary, they were cooled, reduced and framed, particularly by economics! What we expect from sociology is not a more complex *homo economicus* but the comprehension of his simplicity and poverty.

The second pitfall for the sociology of markets is that of denunciation, which is not unrelated to the previous one. Let us heed Durkheim's warning:

> Political economy . . . is an abstract and deductive science which is occupied not so much with observing reality as with constructing a more or less durable ideal: because the man (sic) that the economists talk about, this systematic egoist, is little but an artificial man of reason. The man that we know, the real man, is so much more complex, he belongs to a time and a country, he lives somewhere, he has a family, a religious faith, and political ideas (Durkheim, {1988} 1970 quoted in: Smelser and Swedberg, 1994).

The fuel of this denunciation is again the acknowledgement of the impoverished and abstract character of *homo economicus*, that being of reason, severed of all ties. But this acknowledgement does not lead Durkheim to propose enriching economic theory. The sociologist denounces this reductionism in order to disqualify economic theory and propose replacing it by another theory, a sociology of real man, one taken in a bundle of links which constitute his sociality and hence his humanity. To paraphrase Galileo facing his judges, we could retort: *eppure calcolano!* (and yet they calculate!). This strategy is therefore no more convincing than that of enrichment. Both carefully avoid the only question worth posing: how can the emergence and formatting of calculative agencies be explained?

Whether we choose to enhance the economic theory of the agent or to denounce it, in both cases we formulate the same critique: *homo economicus* is pure fiction. This introduction as well as the entire book in fact, maintain the contrary. Yes, *homo economicus* really does exist. Of course, he exists in the form of many species and his lineage is multiple and ramified. But if he exists he is obviously not be found in a natural state—this expression has little meaning. He is formatted, framed and equipped with prostheses which help him in his calculations and which are, for the most part, produced by economics. Suddenly new horizons open up to anthropology. It is not a matter of giving a soul back to a dehumanized agent, nor of rejecting the very idea of his existence. The objective may be to explore the diversity of calculative agencies forms and distributions, and hence of organized markets. The market is no longer that cold, implacable and impersonal monster which imposes its laws and procedures while extending them ever further. It is a many-sided, diversified, evolving device which the social sciences as well as the actors themselves contribute to reconfigure.

Notes

1 Specialists in the history of economic thinking point out, as an exception to this lack of interest, the two chapters by Marshall (Marshall, {1920} 1961) and Robinson (Robinson, {1974} 1979). Coase confirms this: economic theory is interested in the theory of market prices but 'discussion of the marketplace itself has entirely disappeared' (Coase, 1988). The sociology of the market has not received any more attention (the reader is nevertheless referred to: Baker, 1984; White, 1981; White, 1988.

2 It was certainly the French economist Cournot who was the first explicitly to formulate the (abstract) market: '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 free intercourse with one another that the prices of the same goods tend to equality easily and quickly' (Cournot, {1838} 1927). It was Mill who implicitly introduced the notion of supply and demand. J.-B. Say is credited with the formulation of the term 'the law of the market'.

3 The whole world may be looked upon as a vast general market made up of diverse special markets where social wealth is bought and sold.

4 This assumption is clearly made by Williamson in his discussion of the notion of trust: 'Calculativeness is the general condition that I associate with the economic approach and with the progressive extension of economics into the related social sciences' (Williamson, 1993). In order to emphasize the link with this notion of calculativeness I prefer to qualify agents as calculative rather as calculating.

5 Decentralization, among other things, is a form, itself multiple, of distribution.

6 This essential dimension is often overlooked. It is constantly present in economic or socio-economic theory. Weber stresses it at great length, summarizing his position in the striking, oft-cited phrase: the market is a 'battle of man against man: a peaceful conflict'. This view of the market as a process is obviously at the heart of the neo-Austrian conception (Menger, von Mises, von Hayek). Chamberlin, Schumpeter and later the Evolutionists are part of this tradition. White also emphasizes this point by showing that markets are the juxtaposition of niches that competition causes firms to construct.

7 This point is essential. In an excellent book commented on below (Thomas, N., 1991), Nicholas Thomas expresses it clearly in his comparative analysis of commercial transactions and gifts.

8 This definition of calculation is obviously compatible with what is commonly called rational action or formal (substantive) rationality. It is nevertheless more general, in so far as it defines, in a sense, the conditions in which rational action can emerge. It makes the emergence of calculation analysable rather than taken for granted.

9 H. Simon with his notion of bounded rationality is not entirely spared from this critique: he limits the agent's capacity for mental calculation rather than distributing it.

10 This sums up the revolution introduced in cognitive science by Hutchins (Hutchins, 1995).

11 Such situations of radical uncertainty, which should rather be called situations of ignorance, correspond to cases where the list of possible states of the world is unknown and where no probability can thus be assigned to their occurrence.

12 Without wanting to go into a critique of the content of this text, we would like to highlight one of its paradoxes. Since the (revisable) contract must retain the possibility of annulation (so as not to lose its quality of a contract) it is necessary to imagine a super contract, *ab initio*, which contains all the possible development of the contractual relationship. Renegotiation will imply not the rewriting of a new contract, but the application of the initial super-contract. The life of a contract thus retains its classical form of the execution of an established plan—a contradiction with the situation of radical uncertainty in which the contract is signed.

13 And if the solution opted for by the agent, rather than being that of successive renegotiations, was to accept the incomplete stage of the agreement, it would mean, without any ambiguity whatsoever, that s/he was engaging in a long-term interpersonal relationship.

14 'The human economy is embedded and enmeshed in institutions, economic and non-economic' (Polanyi, {1957} 1971).

15 This analysis enables us to requalify the actors who supply money: the Federal Reserve may at best share this ability with important private actors, the most dominant of which are financial institutions, albeit non bank ones.

16 For a sharp analysis of disinterestness see: Karpik, 1995.

17 It is the viewpoint argued by Levi-Strauss in his famous critique of Mauss whom he accuses of being misled by his native informant (Lévi-Strauss, 1960). The analysis of the mechanisms whereby the agent misleads himself is not unrelated to the old Kantian question of duty and the possibility of revealing a secret urge for self-esteem behind the greatest sacrifice, that which we believe we accomplish purely through duty whereas it is only accomplished in conformity with duty. Similarly, an act of generosity can always be analysed as conforming to generosity and at the same time denied as an authentic act of generosity. On this point see Bourdieu, (Bourdieu, 1997) p.303.

18 This solution is usually preferred by economists. It explains, according to Coleman, why in situations of extreme uncertainty it is rational for an agent to delegate his or her own will to a third party (the case of speculation) (Coleman, 1994).

19 In the case of the gift, as analysed by Bourdieu, the absence of framing of the counter-gift allows for the proliferation of entanglement from which the receiver can no longer extricate him/herself: 'The obligation which starts at the moment when the initial act of generosity is accomplished and which can only increase as the recognition of this debt, always liable to be settled, turns into incorporated recognition, into the inscription in bodies—in the form of passion, submission or respect—, of an insolvable debt said to be eternal' (Bourdieu, 1997). In other words, without framing, ie without a minimum of disentanglement, the ties gradually become irreversible insofar as they become incorporated. Instead of two distinct agents we have two agents bound together eternally.

20 In this respect the case of labour laws is illuminating. The respective rights of employers and employees are constantly reconfigured, thus extending the range of imputable and calculable actions. Until recently sexual harassment or racial discrimination were part of the expensive and offensive overflowing which the law did not contain and which, not being framed, was not taken into account in the calculation of decisions and relations.

21 See also: Swetz, 1987.

22 Moreover, we talk of the disciplining of the market.

23 Law, for example competition law as analyzed by Dumez and Jeunemaître in the

case of cement industry, obviously promotes the calculability of decisions by framing authorized actions and relations.

24 In passing, Miller gives an example of these theoretical debates which take place in hybrid forums and which oppose those who are supposed to be theoreticians and those who are supposed to be practitioners. Rowland, for example, referred to discounting techniques as dangerous non sense and sheer insanity because the accountant should not lift the veil concealing the future. That Rowland ends up being wrong is not important. What is striking is that the theoretical reflection encompasses all the actors.

25 What the English word currency denotes so well.

26 See: Mugnaini, 1994. 'We find here the variety of messages transmitted by bank notes and the power of these inscriptions to repersonalize what was a relationship between strangers.' Like a prostitute who admitted: 'That evening I loved you naturally. Not you though; you did it . . . and when you switched on the light again you gave me the usual hundred lire note. I wrote the day and the date on it' (Eduardo de Filippo, *Filumena Marturano (I Capolavoir di Eduardo)*, Turin, Einaudi, 1973, t.1 P 332).

27 For a complete demonstration see: Thomas, 1991.

28 DiMaggio talks of framing rules to account for the different logics: those which calculate and those which do not calculate. He discovers half the solution with his notion of framing, but immediately loses it with the notion of rules. Yes, it is a matter of framing, but of framing heterogeneous arrangements.

29 Or in scientific institutions. For a complete demonstration see: Law, 1994.

30 We recall here the analyses proposed by R. Boyer who distinguishes four types of capitalist economies corresponding to four different modes of state regulation of the economy: market capitalism (eg, the UK), meso-corporatist capitalism (eg, Japan), social-democratic capitalism (eg, Sweden) and latin capitalism (eg, Italy and France).

31 We have seen how the zero degree of calculation—the gift—corresponds tot the total externalization of relations. Everything is entanglement.

32 It is striking to note that hedging, which is the word used by the actors themselves (eg, hedging a bet) is a perfect synonym for framing.

33 As indicated, the movement is circular. By making use of mathematics, economics provides the economy with calculating tools. This, in turn, enables economics to calculate the laws resulting from the composition of calculations made by calculating agencies. On the explanation of the mathematization of economics by economic agents' use of mathematical tools, see Porter (Porter, 1995).

References

Appadurai, A., (1986), *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press.

Appadurai, A., (1996), *Modernity at Large. Cultural Dimension of Globalization*. Minneapolis: University of Minnesota Press.

Baker, W., (1984), 'The Social Structure of a National Securities Market'. *American Journal of Sociology 89* 775–811.

Bensa, A. and Freyss, J., (1994), 'La société kanak est-elle soluble dans l'argent?' *Terrain* 23: 11–26.

Block, F., (1994), 'The Role of the State in Economy'. In *The Handbook of Economic*

Sociology, ed. Neil J. Smelser and Richard Swedberg 691–710. Princeton: Princeton University Press.

Bourdieu, Pierre, (1979), *La distinction*. Paris: Le Seuil.

Bourdieu, Pierre, (1997), *Méditations pascaliennes*. Paris: Le Seuil.

Burt, Ronald S., (1993), 'The Social Structure of Competition'. In *Explorations in Economic Sociology*, ed. Richard Swedberg 65–103. New York: Russel Sage Foundation.

Callon, M., (1986a), 'The Sociology of an Actor-Network'. In *Mapping the Dynamics of Science and Technology*, ed. M. Callon, J. Law, and A. Rip. London: Macmillan.

Callon, Michel, (1986b), 'Some Elements for a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay'. In *Power, Action and Belief. A New Sociology of Knowledge?*, ed. John Law. 196–229. Sociological Review Monograph. Routledge and Kegan.

Callon, M., (1991), 'Techno-economic Networks and Irreversibility'. In *A. Sociology of Monsters: Essays on Power, Technology and Domination*, ed. J. Law. 132–161. London: Routledge.

Callon, M., (1994), 'Four Models for the Dynamics of Science'. In *Handbook of Science and Technology Studies*, ed. S. Jasanoff, G.E. Markle, J.C. Petersen, and T. Pinch. 29–63. London: Sage.

Callon, M. and Cohendet, P., (1997), 'Between Uniformity and Diversity'. In *Engineering, Innovation and Society*, CAETS, London: The Royal Academy of Engineering.

Chamberlin, E., (1933), *The Theory of Monopolistic Competition*. Cambridge MA: Harvard University Press.

Coase, R.H., (1988), 'The Firm, the Market and the Law'. In *The Firm, the Market and the Law*, ed. R.H. Coase. 1–31. Chicago: Chicago University Press.

Coleman, J.S. (1988), 'Social Capital in the Creation of Human Capital'. *American Journal of Sociology 94*, 95–20.

Coleman, J.S., (1994), 'A Rational Choice Perspective on Economic Sociology'. In *The Handbook of Economic Sociology*, ed. Neil J. Smelser and Richard Swedberg. Princeton: Princeton University Press.

Cournot, A., [1838] (1927), *Researches into the Mathematical Principles of the Theory of Wealth*. New York: Macmillan.

D'Andrade, R., (1995), *The Development of Cognitive Anthropology*. Cambridge University Press, Cambridge.

David, P.A., (1984), 'Clio and the Economics of QWERTY'. *American Economic Review* 75 no. 2: 332–337.

Deleuze, G. and Guattari, F., (1972), *L'Anti-Oedipe. Capitalisme et schizophrénie*. Paris: Minuit.

DiMaggio, P., (1994), 'Culture and Economy'. In *The Handbook of Economic Sociology*, ed. Neil J. Smelser and Richard Swedberg. 27–57. Princeton: Princeton University Press.

Dobbin, F., (1994), *Forging Industrial Policy: The United States, Britain and France in the Railway Age*. Cambridge: Cambridge University Press.

Dumez, H., (1985), *L'économiste, la science et le pouvoir: le cas Walras*. Paris: PUF.

Durkheim, E., (1970), *Cours de sciences sociales*. Paris: PUF.

Eymard-Duvernay, F., (1996), 'Les supports de l'action dans l'entreprise: règles, contrats, engagements'. In *L'état des relations professionnelles. Traditions et perspectives de recherche*. Presse de l'Université de Montréal et Octarès.

Fligstein, N., (1990), *The Transformation of Corporate Control*. Cambridge MA: Harvard University Press.

Fligstein, N., (1996), 'Markets as Politics: A Political-Cultural Approach to Market Institutions'. *American Sociological Review 61* (August 1996): 656–673.

Fligstein, N., (forthcoming). *Markets, Politics and Globalization*. Uppsala: University of Uppsala Press.

Fox, R. and Swazey, J., (1992). *Spare Parts: Organ Replacement in American Society*. Oxford: Oxford University Press.

Garcia, M-F., (1986), 'La construction sociale d'un marché parfait: Le marché au cadran de Fontaines-en-Sologne'. *Actes de la Recherche en Science Sociales* no. 65; 2–13.

Granovetter, M., (1973), 'The Strength of Weak Ties'. *American Journal of Sociology 78*. 1360–1380.

Granovetter, M. 'The Strength of Weak Ties.' *American Journal of Sociology 78* (1973): 1360–1380.

Guesnerie, R., (1996), *L'économie de marché*. Dominos, Paris: Flammarion.

Hart, O. and Moore, J., (1988), 'Incomplete Contracts and Renegotiation'. *Econometrica*, July 1988, pp. 755–785.

Hatchuel, A., (1995), 'Les marchés à prescripteurs'. In *L'Inscription sociale du marché*, ed. A. Jacob et H. Vérin, Paris: L'Harmattan.

Hennion, A., (1993), *La passion musicale*, Paris: Métailié.

Hodgson, G.M., (1994), 'The Return of Institutional Economics'. In *The Handbook of Economic Sociology*, ed. Neil J. Smelser and Richard Swedberg. Princeton: Princeton University Press.

Hoyle, L.F., (1995), 'Standardization across Non-Standard Domains: The Case of Organ Procurements', *STHV, Vol 20*, no. 4.

Hutchins, E., (1995), *Cognition in the Wild*. MIT Press, Cambridge University, Mass.

Karpik, L., (1995), *Les avocats. Entre l'Etat, le public et le marché*. Paris: Gallimard (forthcoming: Cambridge University Press).

Latour, B., (1987), *Science in Action. How to Follow Scientists and Engineers through Society*. Cambridge Mass: Harvard University Press.

Law, J., (1984), *Organizing Modernity*, Oxford: Blackwell.

Lebaron, F., (1997), 'Le dénégation du pouvoir: le champ des économistes français au milieu des années 1996'. *Actes de la recherche en sciences sociales* 119: 3–26.

Lévi-Strauss, C., (1960), 'Introduction à l'œuvre de Marcel Mauss'. In *Sociologie et Anthropologie*, ed. Marcel Mauss, Paris: PUF.

Marshall, A., [1920] (1961), 'On Markets'. *In Principle of Economics, ed. Alfred Marshall*. 323–330. 1. London: MacMillan and Co.

Maupassant, Guy de, (1987), *Le condamné à mort, Contes et Nouvelles* La Pléiade, tome I. Paris: Gallimard.

Mauss, M., [1925] (1969), *The Gift: Forms and Functions of Exchange in Archaic Societies*. London: Cohen and West.

McCloskey, D.N., (1985), *The Rhetoric of Economics*. Madison Wisconsin: University of Wisconsin Press.

McCloskey, D.N., (1990), *If You're So Smart: The Narrative of Economic Expertise*. Chicago: University of Chicago Press.

Meyer, M.W., (1994), 'Measuring performance in Economic Organizations'. In *The Handbook of Economic Sociology*, ed. Neil J. Smelser and R. Swedberg. Princeton: Princeton University Press.

Mugnaini, F., (1994), 'Messages sur billets de banque. La monnaie comme mode d'échange et de communication'. *Terrains, 23*: 63–80.

Nee, V., (1996), 'Symposium on Market Transition'. *American Journal of Sociology 101*: 908–1096.

North, D.C., (1990), *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.

North, D.C., (1977), 'Markets and other Allocation Systems in History: The Challenge of Karl Polanyi'. *Journal of European Economic History* 6 703–716.

Polanyi, K., [1957] (1971), 'The Economy as Instituted Process'. In *Trade and Market in the Early Empires: Economic in History and Theory* , ed. Karl Polanyi, Conrad Arensberg, and Harry Pearson. Chicago: Henry Regnery Co.

Porter, T.M., (1995), *Trust in Numbers*. Princeton: Princeton University Press.

Portet, F., (1994), 'L'argent de la moto. Créer une richesse ou accepter la pénurie'. *Terrain* 23: 115–122.

Robinson, J., [1974] (1979), 'Markets'. In *Collected Economic Papers*, ed. Joan Robinson. 146–167. 5. Oxford: Blackwell.

Sahlins, M., (1976), *Culture and Practical Reason*. Chicago: University of Chicago Press.

Simmel, G., [1908] (1955), *Conflicts and the Web of Group Affiliations*. New York: The Free Press.

Smelser, N.J. and R. Swedberg, (1994), 'The Sociological Perspective'. In *The Handbooks of Economics Sociology*, ed. Neil J. Smelser and Richard Swedberg. 3–26. Princeton: Princeton University Press.

Smith, C.W., (1994), 'Auctions: From Walras to the Real World'. In *Explorations in Economic Sociology*, ed. Richard Swedberg. 176–192. New York: Russel Sage Foundation.

Star, S.L. and Griesemer, J., (1989), 'Institutional Ecology, "Translations" and Boundary Objects. Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39" '. *Social Studies of Science. 19*: 387–430.

Strathern M., (forthcoming), 'What is intellectual property after?' In J. Law (ed.), *Actor Network Theory and After*, University of Keele.

Swedberg, R., (1994), 'Markets as Social Structure'. In *The Handbook of Economic Sociology*, ed. Neil J. Smelser and Richard Swedberg. 255–282. Princeton: Princeton University Press.

Swetz, F., (1987), *Capitalism and Arithmetic*. Chicago: Chicago University Press.

Thomas, N., (1991), *Entangled Objects. Exchange, Material Culture and Colonialism in the Pacific*. Cambridge, Mass: Harvard University Press.

Traimond, B., (1994), 'La fausse monnaie au village. 'Les Landes aux XVIIème et XIXème siècles'. *Terrain* 23: 27–44.

Walras, L., [1926] (1954), *Elements of Pure Economics*. 4th ed. Homewood Ill.: Richard D. Irwin.

Walzer, M., (1983), *Spheres of Justice: A Defense of Pluralism and Equality*. New York: Basic Books.

Weber, M., [1922] (1978), *Economy and Society: An Outline of Interpretive Sociology*. Guenther Roth Claus Wittich ed., Translated by Ephraim Fischoff *et al.* Berkeley: University of California Press.

Weber, M., [1923] (1981), *General Economic History*. New Brunswick, NJ: Transaction Books.

White, H., (1981), 'Where do Markets Come From?' *American Journal of Sociology 87*: 517–547.

White, H., (1988), 'Varieties of Markets'. In *Social Structures: a Network Approach*, ed. B. Wellman and S.D. Berkowitz. Cambridge: Cambridge University Press.

Williamson, O., (1993), 'Calculativeness, Trust and Economic Organization'. *Journal of Law and Economics XXXVI* April: 453–486.

