A Microeconomic Analysis of Institutions

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Abstract

This survey paper has three themes; a microeconomic analysis of institutions, an institutional analysis of microeconomics, and a discussion on the scope for an "institutional microeconomics" that takes insights from psychology and older institutional theory into account. Institutions are defined as the long run rules of the economy that have the character of public goods and whose main function is the reduction of transaction costs. The institutional requirements for the Walrasian equilibrium and for a cooperative solution in a Prisoner's Dilemma like game, are thoroughly analyzed. The paper briefly surveys the main results from the OIE and NIE schools and discusses the possibilities of an interdisciplinarily oriented institutional microeconomics.

Keywords: institutions, microeconomics, Walrasian equilibrium, game theory

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1. Introduction

In all actions that we pursue as economic agents, we are affected by institutions. When we buy apples at the local market, when we try to decide what pair of trousers to buy, when we consider whether it will be worthwhile to start a neighbourhood cooperation or not, institutions structure the way we think and constrain our behaviour. They constitute the rules of the game in game theory settings and the arena where individuals exchange goods and services in their attempts to reach equilibrium. Apart from being behavioural constraints, institutions also serve as a kind of knowledge in a world of imperfect information and imperfectly rational individuals. They can take an almost infinite number of forms; laws, university statutes, ethics, dinner table conventions, norms like egoism or hospitality, etc. Some institutions are more economically relevant than others and some might even be regarded as inefficient from an economist's point of view. However, without the presence of institutions, social interaction would be nearly impossible and there would be no reason why self-interested individual utility maximizers would not be engaged in a constant war of all against all in the struggle over limited resources.

The study of institutions is not a new area within economics. Already in the early twentieth century, institutionalism provided a forceful alternative to orthodox microeconomic theory. However, the institutionalist research programme has never become a part of mainstream economics, and for many years, the insights provided by economists like Thorstein Veblen were in disrepute and were shunned by the economics discipline. With the rise of "New Institutional Economics" in the 1970s, institutions were once again put on the research agenda. Among several prominent contributors, some names stand out; Oliver Williamson (1975), inspired by Ronald Coase, with his contractual theory of the firm, Douglass North (1990), analyzing economic history from an institutional perspective, Mancur Olson (1965) on the emergence of collective action, Robert Axelrod (1986) on the evolution of norms in dynamic game theory settings. But the analysis of the economic consequences of institutions is still confined to a rather small group of economists. In central fields within economics, like growth theory or general equilibrium theory, the existence and relevance of institutions are hardly recognized at all, and when institutions are recognized, they are simply assumed as given. There is further a serious conceptual confusion in the economic literature regarding terms like "institutions", "organizations", and "markets". It has been claimed that these confusions act as a serious obstacle to a sensible research on the subject (Khalil, 1995; Ménard, 1995).

New areas of research within other disciplines also appear to have great relevance for our thinking on institutions. Evidence from social psychology suggests that the utility functions of individuals tend to be misspecified (Rabin, 1998). Preferences may indeed by endogenous to the economic system (Bowles, 1998). In cognitive science, research on the working of the mind has shown that the human brain does not operate like a "lightning calculator", as standard economic theory suggests. Our thinking rather tends to be highly pattern based and path dependent, structured along so called *neural networks*. History and past experiences play crucial roles in the development of these paths (Clark, 1997). Research in economics based upon these findings has still been very limited, but the implications for our perception of individual economic choice are probably very important, perhaps particularly so for our thinking on institutions (North, 1998).

This paper has three purposes: (1) To analyze the microeconomic properties of institutions. In so doing, I will make an attempt to define and disentangle fundamental concepts like institutions and organizations so that a clear understanding of the nature of institutions can be attained. (2) On the basis of (1), to discuss the institutional properties of microeconomics, in particular two of the most commonly used model setups; the Walrasian equilibrium and game theory. (3) To critically survey the literature on the institutional challenge to neoclassical microeconomics and to discuss the scope for an "institutional microeconomics" that takes insights from cognitive science into account. Section two will deal with the nature of institutions (purpose (1)), section three with institutions in Walrasian equilibrium and game theory (purpose (2)), and section four with institutionalism and the future research agenda (purpose (3)). Section five summarizes the main conclusions.

2. The Microeconomics of Institutions

For the purpose of our discussion, I will define institutions as the humanly devised rules or constraints that shape human interaction. Institutions are the rules of the game which help people to form expectations of what other people will do in the presence of uncertainty and imperfect information. Because of this, institutions can be said to limit and define the choice set of individuals (Lin and Nugent, 1995; North, 1990). Institutions necessarily involve interaction of agents and are characterized by common conceptions, routines, habits, and values (Hodgson, 1998).

This very broad definition can be subdivided into *formal* and *informal* institutions. Among the formal institutions, we find for instance laws, constitutions, contracts, and property rights. These are the official rules of a society with a high degree of legitimacy. They are backed by explicit punishment. Formal institutions are purposefully created by the state, by private enterprises, or by other alliances or individuals in civil society and are often, but not always, in close correspondence with the underlying structure of *informal* institutions. [1]

Among the informal institutions, we find for instance norms, ethics, customs, taboos, and ideologies. These are the unofficial behavioural rules of a society, an integrated part of its culture. Informal institutions are learned through socialization and are largely the inherited view of the world from older generations. As such, informal institutions in turn structure the way that the present generation looks upon and thinks about society. In a sense, informal institutions are therefore a kind of knowledge. Boland (1979) claims that the only difference between "institutional knowledge" and ordinary knowledge is that the former takes longer to change.

Whereas it is usually rather simple to trace the origin of formal institutions, the origins of informal institutions is a much more complicated matter. Scholars in the neoclassically oriented "New Institutional Economics" (NIE) discipline would probably propose an instrumental view; all institutions have been consciously created in order to reduce the transaction costs of economic exchange and production. A very different but not uncommon point of view is that institutions are the unplanned consequences of a process of evolution and that institutions therefore can evolve spontaneously (Sugden, 1989). I will return to this discussion later.

Obviously, the prominence of institutions varies a great deal. The political ideology of a society certainly has a more far reaching influence than its dinner table conventions. Khalil (1995) has formalized this idea by categorizing institutions according to *grades*. If a family is a Baptist, Khalil reasons that the grade of the institution Christianity is a *deeper* institution than the grade of Protestantism, which, in turn, is deeper than the grade of Baptism.

A clear distinction must also be made between institutions and *organizations*. If institutions are the rules of the game, organizations (as well as the individuals that the

[1] Lindbeck (1995, 1997) provide interesting discussions on the interaction between economic incentives as defined by formal rules, and the structure of informal norms. The main argument is that norms tend to be "sticky" and that a change in the formal rules will only slowly alter the informal norms. Thus, for instance, the norm that saving is a good thing can live on and make people save long after the formal rules structure has been changed and made saving less profitable.

organization is made up of) are the *players* (North, 1990). [2] A tribe, a trade union, a firm, or a state, are examples of organizations in this sense. Obviously, institutions and organizations are most often strongly interdependent. In some sense, it might be claimed that organizations are the *embodiment* of underlying institutions. For instance, a congregation might be thought of as an organization based upon the institution religious faith. However, this is not always the case. There is ample evidence of organizations which have very little to do with the underlying institutions. Khalil (1995) argues that the implications of a separation of the concepts have not been fully understood by economists like North. The lack of clarity has resulted in a conceptual confusion in the literature where writers do not see or acknowledge the distinction and frequently refer to organizations as institutions.

A further complexity in the literature on institutions is that writers tend to use different concepts for similar phenomena. One such example is the term "social capital". Social capital is essentially equivalent to the set of informal institutions within a social unit. Coleman (1990) views sen entity of social capital as being characterized by two things; (i) some aspect of social structure and (ii) certain actions that are facilitated for those who are within the structure. Whereas physical capital is embodied in machines and human capital in people, social capital is embodied in the relations among persons. An important feature of social capital is therefore the prevalence of informal networks that improve the efficiency of society by facilitating coordinated actions (Putnam, 1993). In a recent empirical paper on growth, Hall and Jones (1999) refer to "social infrastructure", which is meant to capture formal and informal aspects such as the rule of law, corruption, openness to trade, etc. Both social capital and social infrastructure are essentially just variations of the institutions theme.

Another group of writers focuses on one particular type of institutions; *norms*. A norm is a purposively generated behavioural rule of the type: "Do *X*", or: "Don't do *X*", or more complicated rules like: "If you do *Y* (or are in state of nature *Y*), do *X*", or: "If others do *Y*, do *X*" (Elster, 1989). An important property of norms is that violations of a norm will result in some kind of punishment, either by oneself (feelings of guilt), by one's social environment (ostracism), or by society (court sentences). Likewise, compliance to a norm might give rewards. Those who hold a certain norm claim a right to apply positive or negative sanctions (Coleman, 1990). With very strong norms, there might even be a tendency to punish those who do not punish violators of norms. This phenomenon has been referred to as a *meta norm*

[2] Williamson (1998) distinguishes between "institutional environment" (rules) and "institutions of governance" (players). Lin and Nugent (1995) refer to "institutional arrangements" as the rules within a specific social unit

(Axelrod, 1986). Norms are distinguished from *habits* by the fact that the latter have no punishment associated with their violation. A *convention*, in turn, is a habit that is shared by many people which people follow mainly because they do not wish to deviate. When some moral aspects are added to habits and conventions, i.e. when the individual feels that he/she *ought* to take certain actions, then the habits or conventions have become norms. Norms, habits and conventions are institutions in themselves but can also be regarded as the smallest units in the construction of deeper and more complex institutions. However, by putting simple norms of the kind referred to above in the same category as democracy or national constitutions, one runs the risk of getting a definition of institutions that is too broad to be useful.[3]

To some extent, institutions have the characteristics of *public goods*. The benefits of law and order, for instance, can be enjoyed by anyone and by many people at the same time. Institutions are therefore often non-rival. It is, however, easy to think of situations when institutions can be at least partially excludable. A law or a contract might explicitly define for whom the arrangement is concerned, excluding all others. A more proper view of such institutions might therefore be to regard them as *club goods*.[4] For instance, a state's legal system is a good that only the club members, i.e. the citizens of that state, are supposed to enjoy. Even so, in most situations, it seems probable that the effects of an institution would tend to "spill over" to people who are formally not club members. In our example, the rule of law in one state might be a *positive externality* for citizens in neighbouring states.

As always with public goods, the possibility of *free riding* behaviour suggests that no individual agent will be willing to supply the Pareto optimal amount of the good (Samuelson, 1954). When the institution in question has the magnitude of law and order of a nation, the scale of operation is usually so great that only one particular type of agent can supply it; a *state*. The state is perhaps the most important supplier of formal institutions and it has been argued many times that it is the existence of natural public goods like defence and administration of justice that is the main reason historically for the emergence of states. The king or the state bears all the direct costs of the public good but expects taxes and/or services in return. Likewise, private business companies, political parties, and various other associations in society take the responsibility of establishing and enforcing formal institutions on behalf of their subjects. In so doing, organizations supply a public good in its technical

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whereas "institutional structure" is the totality of institutional arrangements including organizations and more universal rules.

[3] I am grateful to Michael Wallerstein for this last point.

sense, but apart from their own increased welfare, these organizations will expect some direct or indirect favours in return, like loyalty, sympathy, gratitude, votes, or even material benefits.

The situation is somewhat different for most of the informal institutions. Who is the principal for a norm like honesty? The only reasonable answer is that there cannot be a single "supplier" of this type of behavioural rules. As I have mentioned before, informal institutions might be hard to change. A ruler can prescribe and enforce almost any type of formal rules but he cannot immediately alter the way people think. No single agent has ever had such an influence over the minds of his fellow human beings. [5] But if this is so, how then are informal institutions created? For the moment, I will confine myself to the observation that the costs of establishing and enforcing informal institutions must, at least to some extent, be borne *individually* by all those involved. For a norm to get established in a group, each individual has to convince him/herself of its righteousness to the degree that he/she is willing, not only to comply, but also to punish possible defectors. This process of becoming convinced must incur some costs, for instance in terms of time or effort. If there are no costs, the individual is either already convinced or is totally incapable of critically assessing ideas. Once in place, the pattern of behaviour that the informal institution prescribes is a public good which anyone can benefit from.

What are the functions of institutions? Lin & Nugent (1995) claim that there are two basic functions; *economizing* and *redistribution*. Economizing refers to the notion that institutions reduce the transaction costs of exchanges between agents. This type of costs include those of negotiation over a contract, of obtaining information about exchange opportunities, of monitoring the contract, and the costs of enforcement when some party starts to defect. Institutions reduce these costs in a number of ways. Law and order see to that trade and production can take place without the agents having to engage in costly protection activites. A system of monetary exchange decreases the costs of transportation since one physical commodity not necessarily has to be exchanged for another physical commodity. A common sense of morale ensures that people will not be stealing or robbing from each other even in situations when they have the opportunity of doing so.

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[4] The theory of club goods was introduced by Buchanan (1965).

[5] Not even the prophets of Christianity or Islam had such an influence. Even though Jesus Christ spent his whole life trying to reform the informal institutions of the Jews, he had relatively little success during his lifetime. In our age, a striking example of the impotence of government efforts to alter the informal institutions, is the quick revival of typically Central European habits and norms even after forty years of communist regime.

The transaction costs approach is usually considered to have sprung from Coase (1937) who used it as an explanation for the emergence of firms, an idea that was later picked up by Williamson (1975). In his famous paper on the "Coase theorem", Coase (1960) stated that in a situation when an externality is present and when there are no transaction costs, it does not matter how property rights are allocated; the agents will trade rights until the optimal solution is reached. However, when transaction costs are present, this proposition does not apply. Thus, in such situations, the allocation of rights matters a great deal. Especially the last point seems to have been rather neglected in the huge literature that the Coase theorem has induced. Wallis and North (1986) and North (1990) extends the transaction costs implications and outline a theory of economic history based upon the idea that only those societies which succeed in creating institutions that efficiently reduce transaction costs, will thrive in the long run.

The other basic function, redistribution, has got more to do with an idea of fairness than with efficiency. Although for instance property rights insure the individual the right (limited or unlimited) to dispose of the property that he or she owns, the situation might arise when a handful of property owners own almost all productive resources while the majority owns nothing. In most societies, this is not regarded as a desirable situation. Ideology, solidarity and charity to the poor, are examples of institutions which might cause resources to be redistributed for the sake of attaining a higher level of equality.

At this stage, it should be pointed out that institutions are far from always efficient. Institutions do not always decrease transaction costs but might actually, when they are inefficient, *increase* transaction costs. Welfare state policies might for example create disincentives towards working and saving (Lindbeck, 1995, 1997) or asymmetries in information and power might encourage harmful rent seeking behaviour and corruption (Krueger, 1974). I will return to this issue later.

3. The Institutions of Microeconomics

One of this essay's main motivations is the observation that in the core of neoclassical microeconomic theory, institutions are taken as given or are simply assumed away. As an illustration of this negligence, I will make an institutional analysis of two of the most often used scenarios in microeconomics; the Walrasian general equilibrium and the Prisoner's Dilemma in game theory.

3.1 Walrasian General Equilibrium

Consider the usual representation of an Edgeworth box with two consumers and two goods with convex, continuous indifference curves, convex budget sets, and initial endowments of the two goods, as shown in Figure 1. If trade occurs when consumers are at their initial endowments, it is possible to reach a Walrasian equilibrium at point E which has the property of Pareto optimality (*First Fundamental Welfare Theorem*). It can also be shown that from any competitive equilibrium, a Pareto optimal allocation can be reached by proper lumpsum redistribution of wealth (Second Fundamental Welfare Theorem). [6]

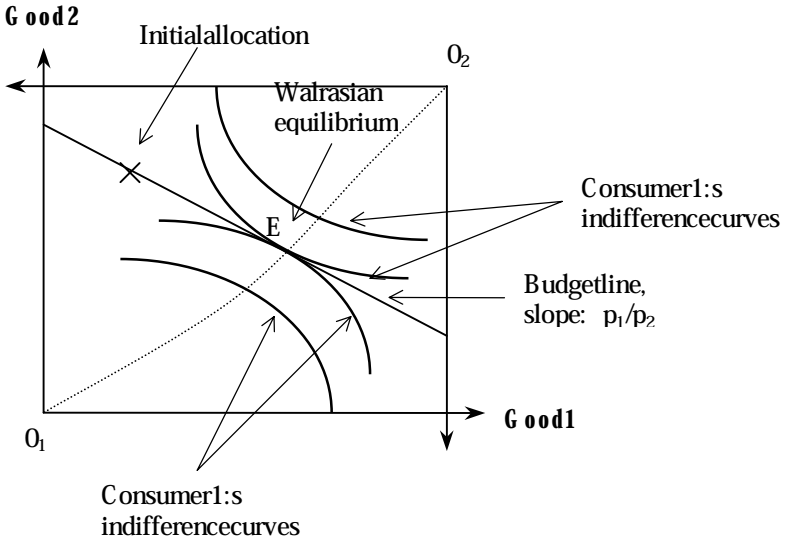

Figure 1: The Edgeworth box representation of a Walrasian equilibrium.

Needless to say, the implications of these two theorems are of paramount importance and serve as the main powerful arguments for a laissez faire economy. Indeed, the First Fundamental Welfare Theorem is nothing but a formal representation of Adam Smith's "invisible hand". With free trade and perfectly competitive markets, a vector of prices will be found that clears all markets so that all excess demand and supply vanish. At this allocation, it is impossible to make anyone better off without making someone else worse off, i.e. we have reached the Pareto optimum. Furthermore, if a social planner should find that the initial endowments were unfairly distributed so that, for instance, one of the agents had a much

greater budget set than the other, a redistribution of resources can be arranged so that another Pareto optimal allocation can be reached.

In this world of free competition and optimal allocations, why would we need institutions? The point of the example is that *the general equilibrium model can work only if a number of institutions, which are usually not mentioned, are in place*. In the section below, I will discuss some of the most important such institutions and argue that they are necessary prerequisites for the Walrasian market solution.

(a) *Self interested agents* with *stable preferences* seeking *utility maximization.* These fundamental institutional assumptions of human behaviour are usually regarded as given by "nature" and applicable to all social situations. This view has often been criticized, for instance by Hodgson (1998). The egoistic utility maximizer is not a universal law in Hodgson's eyes but a special case among many different and equally plausible behavioural assumptions. Sen (1977) remarks that the neoclassical view of the individual is difficult to reconcile with the observation that individuals tend to act according to what he calls "commitments" which are formed by a person's values and sense of morale. In reality, people *do* care about the well being of other people. "Economic man" must therefore me regarded as something of a "social moron" or a "rational fool" (Sen, 1977). Bowles (1998) presents evidence from experimental social psychology which shows that the institutional setup often affects people's preferences, thereby making preferences endogenous and inherently instable. From an evolutionary perspective, Simon (1990) develops a model where altruistic behaviour (socialization) stands just as great chances of surviving the natural selection process as individualism. It has also been suggested that individuals are not maximizers but "satisficers" with "bounded rationality" (Simon, 1982).

(b) *Private property rights and free trade laws*. The two prospective sellers in the Edgeworth box must legally own their endowments of goods so that the goods are excludable. Otherwise there would be no reason for trade; the strongest of the two consumers could just take possession of the weaker agent's whole endowment. Through economic history, efficient private property rights have certainly not always been the case (North, 1981). Nor has free trade. It would rather seem as if unfree trade has been the standard situation throughout history. Even today, when free trade is the official ideology of more or less all governments in

[6] See for instance Mas Colell, Whinston, and Green, (1995), chapter 15.

the Western world, institutionalized barriers to free trade still persist in for instance the EU market for agricultural commodities.

(c) A *market*. A market is indeed a whole set of institutions. It requires social norms for peaceful trade and established information networks (Hodgson, 1998). For trade to occur, there must exist some market place or market mechanism through which the prospective traders can carry out the exchange. Markets usually do not evolve spontaneously but require some kind of planning and coordination. History is full of examples of how the state often consciously have founded cities, market places and fairs. Goodfriend and McDermott (1995) pursuasively argue that a certain critical level of population density is required for agents to abandon primitive production and enter into increased specialization and market exchange.

(d) *Rules of exchange*. First of all, the agents must have a means of communication in common, i.e. they must speak the same *language* (Field, 1984). Further, the rules of exchange must include rules of how to exchange information about the products which are to be traded. The buyer must somehow be able to control that the seller's goods are what they are claimed to be. In this regard, various standards and generally agreed upon measures of height, weight, density, etc, are usually necessary. Some mechanism through which (relative) prices are determined, must also be in place. In the original model, this problem is solved by a "Walrasian auctioneer", who is of course an institution in him/herself. More realistically perhaps is to acknowledge that the price determination process should be greatly facilitated by established rules of negotiation procedures and by the use of a monetary system within which all goods could be put in abstract value. A further requirement must be that the contracts that eventually are settled are enforceable. If they are not, it would once again be optimal for the self interested agent without moral norms to steal back all the goods that he has sold.

(e) *A neutral social planner with perfect information* is necessary for the wealth redistribution in the Second Welfare Theorem. Such a social planner is usually thought of in the form of a state. It is hard to imagine any other agent in the economy who can calculate optimal taxes or redistributions and then carry the changes through. However, states are complex, purposefully created organizations built upon innumerable formal and informal institutions. Their objectives are not necessarily in line with those of its majority of citizens, as public choice theory has indicated. Nor can it be taken for granted that they have perfect

information. The pure version of the Second Welfare Theorem therefore seems to have little relevance to the study of real economies.

But even in a situation when all the institutions above are in place, other institutions might lead to market failures. Through history, various forms of *price regulations* have often been used by governments and policymakers. Price regulations in the Edgeworth general equilibrium model means that the market clearing price might not be attainable (since the budget line might not have the "right" slope). This gives rise to excess demand for some goods and excess supply of others. *Trade quotas* have almost the same effects. Markets will not clear and whereas people will queue to get hold of certain commodities, other commodities will lie in waste since no one wants to buy them. During such arrangements, *blackmarkets* may arise as well as unproductive *rentseeking* activities aimed at "getting past queues". With the prevalence of *asymmetric information* regarding the quality and quantity of the goods, the trader with least information might prefer not to trade at all due to fear of adverse selection. A symmetric information might be institutionalized for instance when firms are allowed to keep the recipes of their commodities secret or when employers are forbidden by law to make certain tests on employees due to reasons of personal integrity.

A part from the aspects above, many institutionalist writers would question the whole idea of a static general equilibrium analysis. Such an analysis would miss the evolutionary aspects of the economy and would only be like a snapshot of reality. Furthermore, at least the older institutionalists would argue that the economy does not have the sort of automatic adjustments of imbalances and self correcting mechanisms that the neoclassical market theory suggests. Instead, a more correct depiction of reality might be "cumulative causation" scenarios where imbalances cause even greater imbalances and development gets stuck in vicious circles (Hodgson, 1989). I will return to this debate below.

3.2 Game Theory

In game theory language, the Walrasian general equilibrium can be considered as a "cooperative game" (Field, 1984). Interagent communication is assumed to exist and in the end, binding and enforceable contracts are produced. What I will now move on to is the non cooperative version of microeconomic analysis, effectively analyzed in a game theoretic framework.

As a frame of reference for the discussion below, consider an extension of the famous "Prisoner's Dilemma" example of a noncooperative, simultaneousmove game. [7] There are two selfinterested players who both have a surplus of a commodity which they consider trading in exchange for their neighbour's surplus commodity. The alternative is to stay home and live in autarky. However, should they decide to bring the commodity to the market for peaceful trade, each of them face the risk of their neighbour betraying them, perhaps by committing robbery or fraud. Should both players go to the marketplace in pursuit of betraying their counterpart, some kind of trade war will erupt where both players will suffer losses. There are thus three possible actions that each player can take; (a) *abstain from trade*, (b) *trade* and *betray* your neighbour, (c) *trade* and *cooperate*. Should any of the players decide to abstain from trade, both players will remain at status quo and get a payoff of 0 (utility units). This follows the logic that there has to be at least two traders to achieve a market. Should both players choose to cooperate (betray), they will both receive a payoff of 1 (1). Should, however, one player decide to betray while the other would choose to cooperate, the betraying party will get 2 and the cooperating –2. The payoffs and the pure strategies of this game are shown in Figure 2.

		Player2		
		a	b	c
Player1	a	0,0	0,0	0,0
	b	0,0	1,1	2,2
	c	0,0	2,2	1,1

Figure 2: "Trade game" version of Prisoner's Dilemma.
Note: Based upon Basu (1995). "a" – *abstain*, "b" – *betray*, "c" – *cooperate*.

The "socially" optimal solution to this problem – i.e. the solution that would maximize the players' joint payoff is obviously "trade and cooperate" (c,c). Each player will go home from the trading with a payoff of 1 and will be strictly better off than without trade. One might even say that this is the only strategy that can cause economywide growth. However,

[7] The example is based on Basu (1995). I will assume that the basic elements of game theory is well known to

due to the possibility of betrayal, cooperation can never be a dominant strategy in this game. It turns out that the Nash equilibrium payoff actually is (0,0), i.e. at least one player will always abstain from trade. Hence, no market economy will arise and there will be no utility growth. Rational, self interested players thus necessarily end up at a solution that is clearly not optimal.

If it, for some reason, is impossible to abstain, so that the (0,0) payoff squares are not considered, we have the classical Prisoner's Dilemma situation, so frequently cited that it has almost become a cliché. In this case, each player's (strictly) dominant strategy will be to betray (b,b) and the Nash equilibrium will end up at (1,1). There will be a trade war and both players will be net losers.

So where do institutions enter this story? They do it in two ways. First, as we said earlier, institutions are often defined as the rules of the game. We have already briefly gone through these rules. Unlike the Walrasian equilibrium example above, we are now in a non cooperative framework where communication is impossible. Just like in the Walrasian world, we have self interested, rational players who maximize their own utility and who have perfect knowledge of their counterparts' goods. We also have a generally agreed upon market place and laws that allow free trade. However, we do not have perfectly enforceable property rights since it is possible to rob unsuspecting fellow merchants. Nor do we have a continuing process of adjustment. The example above is a simultaneous, one shot game.

The second way that institutions enter the game is that institutions determine the strategies available and their respective payoffs. Deceitful behaviour in the trade game assumes an norm that says that it is acceptable to betray someone as long as you yourself stand to gain. In the same manner, cooperative behaviour is also based upon a norm. Institutions thus define the choice set of the players. The payoffs are also affected by institutions. Given that certain strategies exist and are played, a neutral social planner might try to punish certain strategies which he/she considers harmful for society. For instance, taxes, fines, penalites, etc could change the payoff matrix in Figure 2 considerably.

With these remarks in mind, let us go back to the Nash equilibrium solutions of the trade game (a,a) and the pure prisoner's dilemma without the possibility of abstaining (b,b). In Alexander James Field's words, in a setting with self interested players, it really seems as if there exists no explanation to why the world does not degenerate into "a Hobbesian war of all against all" (Field, 1984, p685). People either go to war with each other or live in isolation.

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the readers. For concepts and details, see Mas Colell, Whinston, and Green (1995), chapter 8.

Yet, in our everyday world, one frequently observes stable social existence. How can this paradox be explained?

As the discussion above probably has indicated, institutions can help the players to overcome this problem. The logic of *collective action* is treated in Mancur Olson's (1965) pathbreaking work on interest group formation. Without loss of generality, it is also possible to dicuss the formation of institutions using Olson's basic framework. In all situations regarding collective action, the central question is why anyone would work for the establishment of an institution when an institution has the character of a public good which free riders can utilize? The basic setup in this analysis is the non cooperative game situation outlined in Figure 2. What Olson wants to find are the required elements for making both players play *cooperate*. Olson and his followers conclude that, in general, collective action is more likely (i) the smaller the number of players, (ii) the more homogenous the origin of the players, (iii) the longer the players have been associated with one another before their first game, (iv) the closer the social and physical proximity between them, and (v) the greater the sensitivity of the players to the losses incurred by betrayal (Lin and Nugent, 1995). In other words, the success of collective action and of forming new institutions depend on already existing institutions. As a limiting case when social institutions are very strong, the *betray* strategy will be gone from the choice set of both players. There are then be only two strategies left; *abstain* or *cooperate*. As becomes evident from Figure 2, this transformation of the game implies that *cooperate* becomes the (weakly) dominant strategy for both players, which in turn implies a unique Nash equilibrium at the socially optimal solution (c,c). Such a solution does not seem implausible. It is also a promising one; in the long run, trustful cooperation is the only norm that can create prosperity.

Another strategy that might achieve the optimal solution is to allow the game to be played repeatedly. This means that the game is no longer a one shot affair but a so called *supergame*. Taylor (1976) assumes that nature can be described as an infinitely repeated Prisoner's Dilemma situation. Even though there are no social institutions to begin with, since the game is played an infinite number of times, the players will eventually "learn" to play (c,c) which they realize is the only strategy that avoids a war situation. This outcome is only possible with an infinite time horizon. If there is a terminal date, it will always be optimal to betray in the last round. Likewise, in the second last round, it will also be optimal to betray, and so on. By backward induction, we must conclude that the *betray* strategy by all players constitute what game theorists would call a *subgame perfect Nash equilibrium* (Mas Colell, Whinston and Green, 1995). Thus, it is not enough just to have a repeated game; it must be

infinitely repeated. Can the real world be considered an infinitely repeated game? If one assumes that each generation loyally continues the strategies by their predecessors and if each generation is unselfish enough to attach some utility to the payoffs of future generations, then perhaps the world can be considered to be an infinitely repeated game. However, that is not self evident.

A problem with the idea of "social optimality" is that unlike the Walrasian equilibrium, the "socially optimal" solution in our games is not *Pareto optimal* (Field, 1984). A quick look in Figure 2 shows that the move from (b,c) to (c,c) increases the sum of the players' payoffs from 0 to 2. But the move fails the criterion for Pareto improvement which says that a change is Pareto efficient if it makes someone better off without making *anyone else* worse off. The move from (b,c) to (c,c) causes Player 1:s payoff to decline from 2 to 1. Hence, the move to (c,c) cannot be a Pareto improvement.

In the game theory literature on institutions, it is often *evolutionary games* that are played and discussed. This type of analysis has its roots in evolutionary models in the natural sciences in which species play games against nature. [8] Here, I will only make a very brief outline of the main ideas. An evolutionary game looks much like an ordinary game except that the players are not players in the usual sense but *phenotypes*, born to play a certain fixed strategy. All other people of the same phenotype also play the same fixed strategy. Further, the payoffs of an evolutionary game are not von Neumann Morgenstern utlility levels but the players' *fitness*. Hence, if one phenotype always tends to receive lower fitness in the repeated evolutionary game, then that phenotype will gradually die out from the population. Eventually, only those individuals with the right phenotype will be left. If a new phenotype now appears, called a *mutant*, it will have to play games against the old phenotype. The invasion of mutants will be very small to begin with and will vanish if the old phenotype turns out to be more fit in the long run than the mutant. In that case we say that the old phenotype is *immune* to the invasion from the mutant. If a certain phenotype turns out to be immune against all invasions of mutants, then the strategy that this surviving phenotype plays is an *evolutionary stable strategy*. This strategy is therefore also a Nash equilibrium.

Institutions enter the evolutionary game in the sense that the phenotypes can be thought of as norms for human behaviour. A norm is evolutionary stable if it has been proven to be immune against all other competing norms. Thus, the set of norms or institutions that a society has at a particular time is that which has survived evolutionary competition. These

[8] For a more thorough discussion of evolutionary games, see Maynard Smith (1982) or Basu (1995).

institutions have served their "minimal function" of making their users survive (Basu, 1995). However, this is not to say that they necessarily are optimal for the phenotypes' fitness.

According to Basu (1995), a mutant in a nation is much like a migrant with a set of institutions constraining his/her behaviour. History is full of examples of how small fractions of people move from one culture to another and play games against the prevailing phenotype. The English in India in the eighteenth and nineteenth centuries and Indians in England today are examples of successful settlements of such migrants. The Greek colonies around the Mediterranean in ancient times is another such success story, as well as most Jewish groups in the Western world. Many other mutants have proven less successful in their new environments and their institutions have been dissolved. Even militarily strong migrants, like the Mongols in thirteenth century China or the Germanic barbarians in ancient Rome, have been losers in the evolutionary game and have assimilated the institutions and culture of their defeated enemies.

When a small group of mutants is immediately successful against a whole population of a prevailing phenotype, Basu (1995) claims that the invaders exploit what he refers to as a *normative loophole* in the old phenotype's set of institutions. For instance, in a society where "Jante's law" [9] is a dominant norm among people, a mutant who has a norm towards maximizing his personal exposure in all kinds of situations, would be enormously successful. Basu thinks that the Spaniards' relatively easy conquest of the American civilizations in the sixteenth and seventeenth centuries and the British conquest of India during the eighteenth, can in part be explained by the hypothesis that the invaders successfully exploited normative loopholes in the institutions of the old populations.

4. The Scope For An Institutional Microeconomics

An alternative to the neoclassical microeconomic paradigm is provided by the heterogeneous collection of ideas which are sometimes brought together under the broad heading *institutionalism*. In this section, I will give a brief overview of the two related modes of thought *Old Institutional Economics* (OIE) and *New Institutional Economics* (NIE) and their critique of and challenge to neoclassical microeconomic theory.

[9] The expression stems from a famous novel by Sandemose (1933).

4.1 Institutional Economics

To put it simply, institutional economics recognizes the notion that the Walrasian market equilibrium and the game theoretic framework that we analyzed in the previous section, necessarily require *a number of institutions which can and should not just be taken as given* . Although probably all institutionalist writers would agree to this statement, the brief analysis below will show that there is disagreement between the old and the new traditions on many other aspects.

OIE had its roots in the German and English historical schools and produced prominent writers like Veblen, Mitchell, Commons, and Myrdal. [10] The old institutionalists saw themselves as an alternative not only to the neoclassical way of thinking but also to the Marxist school. Many of the writers were inspired by evolutionism which had then started to influence the social sciences. During the interwar years in the first half of the twentieth century, their influence was at its peak and institutionalism was by some considered to be more "mainstream" than neoclassicism. Institutionalist ideas also played a major role in the formation of the New Deal package.

One of the most striking differences between OIE on the one hand and NIE and neoclassical microeconomics on the other, is their views on the individual agent in the economy. OIE writers are highly critical of the neoclassical assumption of a self sufficient, egoistic, economic man who is also "a lightning calculator of pleasures and pains" (Veblen, 1919). Hodgson (1998, p176) writes:

> "...despite the temporal adjective, the "new" institutionalism is built upon some antiquitated assumptions concerning the human agent, derived from the individualism of the Enlightenment. In this 300 year tradition, a key idea is the notion that the individual can, in a sense, be "taken for granted". Accordingly, the individual is taken as the elemental building block in economic theory."

Like Karl Marx and Max Weber, the old institutionalists claim that the individual is a product of his social environment and that "economic man" is not necessarily a universal phenomenon. Rather, economic man is an institution that has emerged from specific historical and social settings.

[10] This section bears heavily on more extensive overviews such as Foster (1991), Samuels (1995) and Hodgson (1998).

Neither should markets be taken as given. Old institutionalists argue that the market is indeed just a metaphor for a set of institutions which operate within a broader institutional framework. The Walrasian market is therefore only a special case, although an important one. This view should be contrasted with the quite different point of departure of many of the NIE writers, summarized in a famous statement by Williamson (1975, p 20): "...in the beginning, there were markets". Markets are not the only important objects of analysis. It is the whole organizational and institutional structure in an economy that allocates resources and distributes income. The force governing economic outcomes is rather the system of *power relations* than the market price mechanism (Foster, 1991).

Whereas NIE and neoclassical microeconomics are mainly *static* in nature, institutionalism highlights the *dynamic* nature of economies and socities. In the OIE tradition, history plays a fundamental role. Through careful analysis of case studies, it is possible to reach a good understanding of economic processes. In so doing, OIE researchers are often interdisciplinary with methods borrowed from sociology, biology, or psychology. The important thing is that theory has *realism*. The old institutionalists are critical of the neoclassical tendency to formalize social relationships in abstract mathematical models from which hypotheses are formed and tested econometrically. This type of analysis, OIE writers claim, misses fundamental aspects of the economy.

The main goal of OIE is to find appropriate policy prescriptions that will improve the functioning of society. OIE therefore has an activist approach to the research agenda. "Social control" is a keyword for many old institutionalists and the economic role of government is often stressed. This aspect is of course something that institutionalism had in common with contemporary Keynesianism but certainly not with neoclassicism.

OIE gradually lost in importance after the Second World War. It has often been claimed by neoclassical writers that institutionalism failed because it did not manage to present a coherent and well specified theory of the economy. An equally important explanation, however, was probably that neoclassical theory improved its theoretical apparatus during the time and, in some cases, attained a synthesis with Keynesian economics in the postwar era (Rutherford, 1997).

The revival of institutionalism is mainly considered to have taken place during the 1970s, although some of its central works appeared earlier. Among many important inspirators, Ronald Coase (1937, 1960) is probably the most influential contributor with his emphasis on the implications of transaction costs. Coase's early paper on the nature of the firm inspired Williamson's (1975) theory of the firm as a collection of contractual agreements; a very

different view from the prevailing neoclassical notion of the firm as primarily a technological solution. Williamson (1985) claim that there are in fact three earlier traditions with which NIE is usefully compared: (1) the neoclassical conception of the firm as a production function, (2) the Arrow Debreu extension of general equilibrium to deal with uncertainty, (3) the applied price theory orientation favoured by postwar Chicago economists. By emphasizing the prevalence of institutions, NIE reaches new conclusions and implications from these basic theories. Hence, NIE uses neoclassical concepts and methodology to a much greater extent than OIE. The way that NIE differs from neoclassicism can be said to be that NIE makes a shift of focus away from "within rules choices" to choices with rules or institutions as constraints (Buchanan, 1991). To complete the analogy, OIE differs from neoclassicism and NIE in that it regards institutions both as constraints to individual behaviour *and* as influencing individuals' preferences and objectives (Hodgson, 1993).

NIE is now a vibrant field which has attracted scholars from various backgrounds. A complete survey of the literature is certainly beyond the scope of this essay. [11] Lin and Nugent (1995) divide NIE into those subdisciplines studying (implicitly or explicitly) the *demand* for institutions and those studying the *supply*. Those studying the demand for institutions usually take as their point of departure the notion that economic exchanges and interactions give rise to transaction costs. We saw in section 3 what types of costs this refers to; costs of obtaining information, of negotiation, of monitoring that contracts are fulfilled, of punishing defectors, etc. Coase (1937) and Williamson (1975) see these costs as the primary reason for the establishments of firms. Transaction costs are also the basis for Douglass North's (1990) more macro oriented discussion on institutions and economic performance. Institutions' primary purpose is to reduce transaction costs and thereby enhance economic performance. The "Law and Economics" subdiscipline of NIE studies the behaviour of rational agents in a setting where rules of law impose prices on various nonmarket decisions (Posner, 1987). A related area is the economics of property rights and contracts (Alchian, 1965).

Risk is another factor that might positively affect the demand for institutions. The Arrow Debreu equilibrium theory of contingent goods lends itself conveniently to analyzing the development of risk sharing contracts and insurance institutions in the presence of uncertainty. A often used example is that of a landlord and a tiller where the landlord is the *principal* and the tiller the *agent* and where the quantity and quality of harvests depends on the weather, which might be good or bad. [12]

[11] Eggertsson (1990), Lin and Nugent (1995), and Foss (1995) provide extensive surveys on the NIE literature.
[12] See for instance Otsuka, Chuma and Hayami (1992).

The study of the supply side of institutions is concerned with the issue of how institutions are formed. A key concept within this discipline is the previously discussed *collective action* (Olson, 1965). The collective action approach also offers a convincing explanation to why small lobby groups often can be so effective in their pursuits. The main reason is that the other citizens in society might be "rationally ignorant" about the matters that the interest groups work for, which in turn might lead to the "exploitation of the great by the small". When rent seeking interest group behaviour becomes an accepted institution in society, there is a risk that too much resources are devoted to unproductive activities, which might imply lower growth (Olson, 1982).

Sugden (1989), inspired by Austrians like Hayek, argues that at least informal institutions can arise without conscious human design through what he refers to as "spontaneous order". The idea that people can stand outside society and rationally appraise its institutions is, in fact, nothing but an illusion. Instead, the institutions of a free society are the unplanned consequences of a process of evolution. The development of institutions should thus be seen as a part of an evolutionary development where the capacity of replication and survival are more crucial than economic efficiency.

4.2 Towards an Institutional Microeconomics?

The success of NIE might be summarized as; (i) the creation of a coherent theory of how contracts and collective action can be seen as the logical outcome of rational individuals' utility maximization in a world of uncertainty, (ii) an analysis of how these institutional constraints alter the pattern of individual choices as predicted by othodox microeconomic theory.

Like all schools in economics, NIE has received its fair share of criticism. Hodgson (1993, 1998) writes that although the NIE tradition has introduced an important dimension into economic theory namely that of institutions as constraints to individual behaviour NIE still follows the route of "methodological individualism" by taking individuals as given. Atomistic individuals, along with their behavioural characteristics, are seen as the elemental building blocks in theories of social or economic systems, but the NIE has so far failed to explain the evolution of the rational individual utility maximizer him/herself. Nor has NIE been able to show how institutions, once in place, affect individual preferences and characteristics.

Is this a satisfactory state of the art? Perhaps the study of how individual behaviour and preferences evolve, is not an issue for economists? Hodgson (1993) and Frey (1993) argue that economic theory *should* attempt to explain how institutions like self interest, rationality and preferences evolve and how they, in turn, affect markets and prices. Stopping short of such fundamental aspects does not make economists credible in their analyses of society. Indeed, Hodgson (1998) suggests that it should be possible to develop an "institutional microeconomics" that takes these aspects into account.

How then should such an institutional microeconomics proceed? One such path seems to be to learn from *experimental social psychology*. Rabin (1998) presents evidence from various experiments that convincingly refutes some of the basic axioms of in our modelling of individual utility functions. For instance, individuals often seem to be more concerned with *changes* in outcomes, relative to some reference level, than with absolute levels of outcomes. It is further shown that people indeed have difficulties in evaluating their own preferences and that one can not disregard norms like fairness as an important part of human behaviour. In a similar vein, Bowles (1998) shows that the economic arrangements in a society, in particular the market situation, tend to influence the evolutions of tastes, values, and personalities, thereby making preferences endogenous.

Research on the working of the brain has also confirmed the widespread suspicion that the human mind does not act as a perfectly logical calculator which takes every relevant fact into account. Rather, human thinking appear to follow so called *neural networks.* [13] These structure our reasoning and in many ways determine how we think. The development of neural networks depends on our learning, through formal education and socialization, and on our past experiences. What we are taught by our fellow human beings is in turn a product of the experiences of older generations. Our thinking is thus highly *path dependent* in the meaning that our past, and other people's past, influence how we think today. Our perception of the world is also very much *pattern based*; given that we recognize a certain pattern in our everyday life, our mind almost instinctively tells us how to act. If we do not recognize any familiar pattern in a situation that we encounter, we act in accordance with the pattern that the situation is most similar to.

It has been suggested that these insights from cognitive science also should be applicable to the theory of how institutions evolve (North, 1998). Indeed, institutions are in their essence simply mind constructs or patterns which are formed by our thinking. In Clark's (1997) terms,

[13] The part on neural networks relies heavily on Clark (1997).

they are the "scaffolds" of choice situations. The development of institutions is therefore also highly path dependent and to a great extent a function of our history. This would explain the great divergence in institutional structure that can be observed between societies which have been isolated for a considerable time, for instance the previously mentioned difference in institutions between the Spaniards and the Indians in the sixteenth century.

In summary, a synthesis of cognitive science and microeconomic theory would probably have great implications for our view on institutions and the economy in general. It might even have the potential of laying the grounds for an institutional microeconomics that considerably would improve the realism of models on individual human behaviour.

5. Conclusions

In this essay, I have tried to outline a careful description of the nature of institutions. I have defined institutions as the rules of human behaviour which act as constraints in economic situations and define our choice sets. Institutions can be formal or informal and of varying prominence. A clear distinction must be made between institutions, which are the rules of the game, and organizations, which are the players. Norms, conventions, and social capital are basically just different words for institutions. Institutions often have the character of public goods, or, more specifically, club goods.

Although seldom explicitly mentioned, institutions enter microeconomics in a number of ways. For the Walrasian general equilibrium solution, some of the required institutions are (i) self interested, utility maximizing individuals, (ii) private property rights and free trade laws, (iii) a market, (iv) rules of exchange, and (v) a neutral social planner. In game theory settings, basic rules regarding cooperation, order of playing, and utility maximization are in fact institutions, as well as the set of strategies available and the payoffs of different outcomes. Institutions can also be the solution to a move from socially nonoptimal outcomes, like abstaining from trade or betrayal, to the optimal solutions like trade and cooperate. Evolutionary game terminology provides some valuable insights to how phenotypes with a socially optimal norm during certain times can become immune to mutants with nonoptimal norms, thereby creating periods of prosperity.

The institutionalist challenge to neoclassical economics has an old (OIE) and a new tradition (NIE). The OIE criticized the neoclassical assumption of rational utility maximizers and self equilibrating market mechanisms. History and dynamic aspects of the economy were

seenasmoreimportantthantheneoclassicalstaticanalysis.OIEsawthepuremarketsolution as a special case which was not always a valid description of reality. The NIE tradition is moreinfluencedbyneoclassicaltheoryandseesinstitutionsmainlyasbehaviouralconstraints inutilitymaximizingsituations.Thedisciplinehasgainedmanyfollowersinrecentyearsand hascomeupwithnewinsightstothetheoryofthefirm,toeconomichistory,tothestudyof goverment and voting behaviour, and to the theory of collective action. However, NIE has still failed to present a comprehensive analysis of the formation of informal institutions like normsandbeliefswhichoftenarenecessaryprerequisitesforformalinstitutions.NorhasNIE been able to show how institutions, once in place, affect individual preferences and objectives. The road ahead for institutional theory appears to be a synthesis between microeconomicsandcognitivescience,i.e.aninstitutionalmicroeconomics,whichrecognizes thepathdependenceandevolutionaryaspectsofhumanthinking.

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