# MARKET INSTITUTIONS AND ECONOMIC DEVELOPMENT: AN INVISIBLE HAND OR A PRISONER'S DILEMMA?

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## I.- INTRODUCTION

A well known expert in game theory has written about the Prisoner's Dilemma: "Models derived from Prisoner's Dilemma point to a clear refutation of a basic assumption of classical economics, according to which pursuit of self-interest under free competition results in collectively optimal equilibrium".[1] If this statement were true, the foundations of not just classical economics but also of market economics at large should be rejected. A free market economy could still be an efficient system, even the most efficient economic system; but new principles based perhaps more in a Kantian categorical imperative approach than in the utilitarian approach used by most economists in the last two hundred years should be found to explain such efficiency.

The thesis of this paper, however, is that such an argument is incorrect and derives from a misunderstanding of the orthodox economists' message. What mainstream economists say is not that the pursuit of self-interest results in an efficient solution for society in every instance, but that economic agents in pursuit of personal gain will produce a social optimum if, and only if, society has laws and institutions that reward effort and honest behaviour.

To explain this alternative perspective of the problem of social cooperation in this article I shall utilise the work of Adam Smith. The conclusion that the institutional framework is a fundamental factor for understanding the efficient functioning of markets certainly goes well beyond the work of Smith, encompassing current economic perspective on the role of law and institutions in economic development; but the foundations of the

[1] Rapoport (1987), 975. This idea can also be found in many introductions to game theory and has become quite popular.

model can be found in the works of Smith and most developments of the theory are founded on his analysis.

## II.- SELF INTEREST AND SOCIAL OPTIMUM

The main contribution of Adam Smith to contemporary economic thought is surely his theory that explains how self-interest results in socially optimal effects via the use of the market mechanism. If the invisible hand works, then one of most basic economic problems is solved, and the role assumed by the public sector is necessarily limited. Smith's well-known parable of the invisible hand constitutes the basis of his explanatory model of the functioning of a system of free market economy.

This idea is however only mentioned on very few occasions in his work. In *The Theory of Moral Sentiments* Smith asserts that people are selfish, but even when they look out for their private interest, all society benefits from their economic activity. And, what may be more interesting, self–interest produces a distribution of income not very different to that under initially equal distribution:

"…in spite of their natural selfishness and rapacity, though they mean only their own conveniency, though the sole end which they propose from the labours of all the thousands whom they employ be the gratification of their own vain and insatiable desires, they divide with the poor the produce of all their improvements. They are led by an invisible hand to make nearly the same distribution of the necessaries of life which would have been made had the earth been divided into equal portions among all its inhabitants; and thus, without intending it, without knowing it, advance the interest of the society, and afford means to the multiplication of the species". [2]

Better known is the reference to the invisible hand that Smith makes in *The Wealth of Nations*. Discussing why restrictions on the employment of capital do not make sense, and explaining why every individual endeavours to employ his capital in the support of the domestic industry, Smith writes:

"He generally, indeed, neither intends to promote the publick interest, nor knows how much he is promoting it. By preferring the support of domestick to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its

[2] Smith (1759/1976), 184-185

produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was not part of his intention." [3]

It is interesting to note that this reference is not made in the context of the analysis of markets developed in books I and II of the work, but in chapter 2 of book IV, in relation to a specific case of international economics, not central certainly to the main arguments of the work. In fact, it seems that Smith did not make of this idea the cornerstone of his model, as some other economists would later do. And he was conscious of possible market failures that do not allow the invisible hand to perform its role. It is also important to note that Smith wrote that the invisible hand works "in this as in many other cases", assuming that an inadequate institutional framework could produce all kinds of market distortions (market failures in modern economics language).[4] As it is shown in section III of this article, a substantial number of pages of *The Wealth of Nations* deal with these kinds of problems and the legal or institutional reforms that can be introduced to make the economy work better.

The parable of the invisible hand has been used and adapted by numerous economists, defending a system of free market economy in which the role of the state is very limited. One notion of the invisible hand is, for example, behind the theories of harmonious interests developed in the 19th century. Henry Carey and Frederic Bastiat, to mention only two well known names, argued that the interests of different social groups are harmonious; and Bastiat wrote a book called *Harmonies économiques* to show that, given this harmony of interests, the free activity of economic agents, with minimal government regulation, would produce the most efficient results.[5] Furthermore, some other models of social organizations based on the principle of individual freedom, such as Hayek's theory of spontaneous order, cannot be understood without some kind of invisible hand assumption. And the basic principle of a laissez-faire legal system, freedom of contract, assumes that the main role of public policy should be to allow individuals to achieve their private goals, social welfare being influenced by their behaviour. Sir George Jessel wrote in 1875 that a fundamental rule of public policy should be that "men of full age and competent

[3] Smith (1776/1976) I, 456
[4] Fleischacker (2004), 138-142
[5] Bastiat (1860)

understanding shall have the utmost liberty of contracting and that their contracts when entered into freely and voluntarily shall be held sacred and shall be enforced by Courts of Justice." [6] Mainstream economics uses this kind of argument in the formulation of the basic theorems of welfare economics. The first fundamental theorem of welfare economics says that competitive markets allocate resources in a society in the most efficient way; and, the reason for this has to be that, if the basic assumptions of a competitive market are fulfilled, the pursuit of self interest produces the best possible results under the direction of an invisible hand.

But what happens when behaviour based on individual maximisation does not lead to socially optimal results? In other words, what happens when economic agents behave like prisoners within the standard model in game theory?

The prisoner's dilemma was first framed by Flood and Dresher in the fifties and formalized in the well known model of prisoners with years of prison as payoffs by Albert Tucker. In the most popular version of this model a couple of thieves have been arrested by the police. Since the information that the prosecution has been able to get is incomplete, both know that they can get a reduced sentence (let us say six months in prison) if they do not confess and do not accuse each other. But thief A knows that if he does not confess and thief B does and accuses him, B would get only three months, and A's sentence would be 5 years (and vice versa, since the game is symmetrical). So, since they do not know what will be the accomplice's strategy, they accuse each other and both get five years.

There are some basic assumptions in this model. The first one is that the prisoners maximize their utility functions by minimizing the period of jail time they get. A second important assumption is that this game is usually presented as a one shot game and excludes both previous experience in similar cases and the possibility that the thieves negotiate their strategies. Both prisoners know that the outcome of such a game (five year sentences) is not optimal for them; so it would be in their interests to change one or more assumptions of the game to allow some kind of cooperation that would put them in a better position.

I think that the fundamental problem to be resolved by new institutional economics is the manner in which norms – understood in an ample sense, including not just laws but

[6] In *Printing and Numerical Registering Co. v Sampson* (1875). Quoted in R. Epstein (1999), 58

also customs, religious principles etc. – offer incentives to economic agents to escape from inefficient results based on rational strategies, if the assumptions of the prisoners dilemma are adhered to. These models of institutional analysis do not reject the possibility that the invisible hand may not function, but highlight the need to have an adequate legal and institutional framework.

Let us consider two cases in which legal regulations try to find through legal rules an efficient solution to a prisoner's dilemma. Let us call the first the manager's dilemma and the second the creditor's dilemma. In the first we have two managers of two competing companies that have to make a decision on raising or not their prices to increase their profits. The payoffs of their strategies are represented in Figure 1.

FIGURE 1.- The manager's and creditor's dilemmas

| | | B | |
|---|---|---|---|
| | | Cooperate | Defect |
| A | Cooperate | 10,10 | 2,14 |
| | Defect | 14,2 | 5,5 |

Cooperation in this game means reaching an agreement with the other company to raise prices. If both managers do that, each company will get a profit of 10. But if they do not trust each other and follow the strategy of defect, profits will be only 5. The worst possible solution is, of course, to cooperate when the other manager defects. If this is a one shot game and an agreement cannot be enforced, defect is a dominant strategy that offers the best payoffs for all possible strategies of the other player. And if both play defect they will see their profits reduced.

In the creditor's dilemma the players are two companies that have credits in a bankruptcy procedure, their value being 25 monetary units. But the total value of the debtor's assets is only 20. Two options again are offered to the creditors. Cooperation means in this case accepting to divide into two equal parts the debtor's assets and receive 10 monetary units each. To defect means to go to court in order to try to get the maximum percentage of the credit at the expense of the other company's interests. Figure 1 also represents this dilemma. Cooperation offers the best payoffs because it minimizes transaction costs. If both defect, however, a substantial part of the debtor's assets will be spent on legal expenses, reducing the net value of the recovered credits to five. Again in this case, if an agreement is not enforceable, to defect is a dominant strategy, giving the best payoffs with all possible strategies of the other creditor. Both parties will go to court and lose half of the net value of their credits.

Why have I presented two cases with the same potential strategies and the same payoff matrix instead of one? From the players' perspective both games are very similar; and there are no substantial differences in the way they can act. But if we look at these two cases from the point of view of the economy and the society to which these companies belong , these two games are really quite different. In the manager's dilemma, cooperation means more profits for both companies, but, at the same time, higher costs for society due to the higher prices that consumers have to pay and other inefficiencies that usually can be found in monopoly markets and cause dead weight losses. This is why antitrust law exists and forbids sellers to agree on raising prices in markets: an agreement in the manager's dilemma would be against the law in most legal systems.

Quite different would be the effects on society of a cooperative agreement in the creditor's dilemma. In this case cooperation is beneficial to players, but is beneficial also for society, since this strategy reduces inefficient legal expenditures and, therefore, social losses. And this is the reason why most legal systems forbid creditors from reclaiming their loans in a separate legal procedure and force them to act in a collective way to dispose of the assets of the bankrupt company.

If some of the initial assumptions of the prisoner's dilemma are changed, it is possible to find solutions that allow the parties to reach an equilibrium in which the players acquire a higher level of utility. Firstly, a different assumption might be to give the players the possibility of talking among themselves. If they can negotiate and reach an agreement that can be enforced the prisoners would be inclined to change their initial strategies and to cooperate. A second possibility would be to introduce into the model an assumption according to which the players have frequent dealings with each other. In this case the prisoners know that their interest is to maximize not their short run utility, but their long run welfare; if they have previously been arrested several times, they know that they will benefit if they act in a cooperative manner whenever a new arrest takes place. Or, finally, it is possible to create an external rule that forces the players to follow a cooperative strategy creating very high costs in the case of different behaviour (for instance, both prisoners are members of the Mafia and know the result of talking too much to the police).

The effects of these possible changes in the basic rules of the game have been studied and applied to different branches of economics. The first – the agreement to cooperate – assumes the existence of low transaction costs that allow the players to reach by themselves an efficient solution without any external regulation, in the spirit of Coase's model. If we look at the problem from a game theory perspective, this possibility of reaching an agreement might be enough to transform a non-cooperative in a cooperative game. The second assumption defines an iterated game in which players try to maximize their long run utility levels through cooperative strategies. A good example is the tit-for-tat strategy, in which a player cooperates as a first move and, in the following steps, mimics the strategy of another player or players (cooperate or defect).[7] The last one assumes the presence of an institutional framework that forces people to play cooperative strategies. These models are important for the economic analysis of law and institutions. Let us assume that an agreement through negotiations is impossible –or very difficult because transaction costs are too high. In these cases a legal rule forcing people to cooperate could be efficient, as we have seen in the bankruptcy creditor's game.

## III.- A FAILURE IN THE INVISIBLE HAND: MERCHANTS IN *THE WEALTH OF NATIONS*

Studies addressing Smith's analysis of self-interest and the invisible hand are generally based, for obvious reasons, on *The Wealth of Nation*s. Moreover, Smith's *Theory of Moral Sentiments* has also long been recognised as providing valuable insight into his

[7] Axelrod (1984) found that this strategy was the most successful solution to an iterated prisoner's dilemma.

view of human behaviour. Highlighted by Viner more than seventy years ago,[8] it is commonly suggested that Smith presented his model of self-interested behaviour in *The Theory of Moral Sentiments* as a general theory, without stopping to address possible shortcomings in the principle. Throughout *The Wealth of Nations*, however, Smith would dedicate many pages to highlighting situations where the principle of the invisible hand does not work.

It is true that Smith clearly postulated that when a person seeks his own self-interest he frequently promotes social welfare in a far more effective manner than when social welfare is his main objective.[9] The number of instances where individuals act in their own self-interest but do not promote social welfare, however, is numerous. As G. Stigler has pointed out, some of these cases coincide with what we identify today as market failures, which justify the public provision of certain types of goods. But the vast majority of these cases refer to situations where there are information failures or regulations that provide inadequate incentives to economic agents.[10] In the first type of cases, the agents are not capable of foreseeing the results of their actions. In the second, the legislator, for reasons of ignorance or bias, is not capable of foreseeing the effects of their own rules. This is well-throdden territory in the domain of the institutional economics of our times.

One of the social groups of which Smith was especially critical in *The Wealth of Nations* were merchants – in addressing their contribution to the welfare of the entire community. Smith's fundamental work is far from being a cry for business interests. On the contrary, the merchant and the businessman are usually presented by Smith as belonging to a group which one must treat with utmost caution, given that their endeavours to optimise their interests might induce damages that would be borne by the rest of society. It is true that Smith himself wrote a now well-known passage identifying that we obtain our meal due to the interests and not the benevolence of the butcher, the brewer and the baker.[11] But there were also numerous occasions where he identified a schism between the public

[8] Viner (1927/1960),
[9] Smith (1776/1976), I, 456
[10] Stigler (1971/1982), 144-145
[11] Smith (1776/1976), 26-27

interest and that of the merchants. And he did not hesitate in recommending that every regulatory proposal be attentively examined to avoid harm to the general public.[12]

It is important to identify that, for Smith, the problem was not just a clash of interests, but also that the State could worsen the situation via unsuitable regulatory measures. And this was of course not the only comment made by Smith in relation to this question. Very few paragraphs from *The Wealth of Nations* are more well-known than those which purport that rarely do members of the same business or profession gather together, even if the intentions are festive or for entertainment, without finishing up in a conspiracy against the public interests and the raising of prices. The following text which furthers this notion is much less known, where Smith affirms that:

> "It is impossible indeed to prevent such meetings, by any law which either could be executed or would be consistent with liberty and justice. But though the law cannot hinder people of the same trade from sometimes assembling together, it ought to do nothing to facilitate such assemblies; much less to render them necessary...An incorporation not only renders them necessary, but makes the act of the majority binding upon the whole. In a free trade an effectual combination cannot be established but by unanimous consent of every single trader, and it cannot last longer than every single trader continues of the same mind. The majority of a corporation can enact a bye-law with proper penalties, which will limit the competition more effectually and more durably than any voluntary combination whatever.[13]

The text is interesting because it communicates that the law should not try to reduce the transaction costs of forming agreements forged between special interest groups. Note that this reduction in costs allows merchants to escape the equilibrium result of a Prisoner's Dilemma, but as we have seen in the previous section, the case belongs to the set of problems in which the effect of the cooperative strategies by the players *is* harmful for social welfare; given that in this case, the social optimum is reached through competition and not through cooperation between the economic agents concerned.

In any case, there is an underlying notion in all of the arguments put forth by Smith according to which competition is the basic defence enjoyed by consumers against potential strategic behaviour by producers. To wit, this principle is explicitly identified on many occasions in his work. To cite just one example:

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[12] Smith (1776/1976), 267
[13] Smith (1776/1976), 145

"To widen the market may frequently be agreeable enough to the interests of the public; but to narrow the competition must always be against it, and can serve only to enable dealers, by raising their profits above what they naturally would be, to levy, for their own benefit, an absurd tax upon the rest of their fellow-citizens.[14]

Closed markets – be they a result of natural factors or measures undertaken by producers to keep markets small in size – restrict the functioning of a mechanism which transforms self-interest into public interest; and as such must be borne in mind, according to Smith, in the institutional framework as a condition for the functioning of the invisible hand.

## III.- MERCHANTS AND POLITICIANS BEHAVIOUR AS GAME STRATEGIES

Identified above, academic analysis of Smith's work on self-interest and the invisible hand has been centered on *The Wealth of Nations* and *The Theory of Moral Sentiments*. Insufficient attention has been granted however to some important texts found in the *Lectures on Jurisprudence*, which Smith expounded in Glasgow in 1760. These notes are, however, of substantial interest from the perspective of institutional economics, because therein Smith analysed numerous legal standards and institutions. And, what is more important, Smith in this work often presents an economist's vision, which ensures that his observations sometimes extend beyond conventional legal analysis, including important contributions of direct relevance to current work in the economic analysis of law.[15]

Salient to our discussion here, in these lectures Smith presented an interesting explanation of merchants' behaviour and that of members of other professions, which highlights a conduit to escape the Prisoner's Dilemma – referred to above – via institutions that shape the behaviour of economic agents. The following passage is long but is worthy of reproduction in its entirety.

[14] Smith (1776/1976), 267; the same idea can also be found in 84, among others.
[15] An analysis of Smith's theory of crime – presented in the *Glasgow Lectures* – from the perspective of the modern economic theory can be found in Cabrillo (1986).

"Whenever commerce is introduced into any country, probity and punctuality always accompany it. These virtues in a rude and barbarous country are almost unknown. Of all the nations in Europe, the Dutch, the most commercial, are the most faithfull to their word. The English are most so than the Scotch, but much inferiour to the Dutch, and in the remote parts of this country they (are) far less so than in the commercial parts of it. This is not at all to be imputed to national character, as some pretend. There is no natural reason why an Englishman or a Scotchman should not be as punctual in performing agreements as a Dutchman. It is far more reduceable to self interest, that general principle which regulates the actions of every man, and which leads men to act in a certain manner from views of advantage, and is as deeply implanted in an Englishman as a Dutchman. A dealer is afraid of losing his character, and is scrupulous in observing every engagement. When a person makes perhaps 20 contracts in a day, he cannot gain so much by endeavouring to impose on his neighbours, as the very appearence of a cheat would make him lose. Where people seldom deal with one another, we find that they are somewhat disposed to cheat, because they can gain more by a smart trick than they can lose by the injury which it does their character. They whom we call politicians are not the most remarkable men in the world for probity and punctuality. Ambassadors are still less so: they are praised for any little advantage they can take, and pique themselves a good deal on this degree of refinement. The reason of this is that nations treat with one another not above twice or thrice in a century, and they may gain more by one piece of fraud than (lose) by having a bad character. France has had this character with us ever since the reign of Lewis XIV*th*, yet it has never in the least hurt either its interest or splendour.

But if states were obliged to treat once or twice a day, as merchants do, it would be necessary to be more precise in order to preserve their character. Wherever dealings are frequent, a man does not expect to gain so much by any one contract as by punctuality in the whole, and a prudent dealer, who is sensible of his real interest, would rather chuse to lose what he has a right to than give any ground for suspicion. Every thing of this kind is (as) odious as it is rare. When the greater part of the people are merchants they always bring probity and punctuality into fashion, and these therefore are the principal virtues of a commercial nation."[16]

There are numerous interesting ideas in the above paragraphs. At the moment of explaining why individuals act in a certain manner, Smith did not look for simple

[16] Smith (1766/1978), 538-539. It is interesting to note that Smith made also reference to ambassadors and treaties in *The Theory of Moral Sentiments*. In part III, chapter 3, "Of the Influence and Authority of Conscience" Smith used his theory of the impartial spectator to explain ambassador's behaviour. He wrote that " The property of our moral sentiments is never so apt to be corrupted as when the indulgent and partial spectator is at hand, while the indifferent and impartial one is at a great distance…In war and negotiation, therefore, the laws of justice are seldom observed. Truth and fair dealing are almost totally disregarded. Treaties are violated; and the violation, if some advantage is gained by it, sheds scarce any dishonour upon the violator. The ambassador who dupes the minister of a foreign nation, is admired and applauded. The just man who disdain either to take or to give any advantage, but who would think it less dishonourable to give than to take one; the man who, in all private transactions, would be the most beloved and the most esteemed; in those public transactions is regarded as a fool and an idiot, who does not understand his business." Smith (1759/1976), 154-155. I am thankful to Prof. Carlos Rodríguez Braun for drawing my attention to this text.

arguments or common interpretations. He could have said that the Dutch are as a matter of custom, religion or history, for example, more honest than the Scottish; or that those who become active in politics do so because they have low moral standards when it comes to furthering their own self-interests. But, without denying that some persons tend, a priori, more towards probity and punctuality than others, he affirms that it is the constraints that govern individual activity that primarily explain individuals' behaviour. Moreover, Smith concretely identified the frequency of contract as being perhaps the most important factor to explain merchants' behaviour. And, as we have seen, frequency is precisely one of the most important factors that allow parties to convert a non-cooperative game into a cooperative one.

Smith's argument can be revised from this perspective. To simplify, let us suppose that there are only two professions –merchants and politicians-, that it can be proved empirically that the level of integrity is less in the second profession than in the first one and that people that belong to a specific profession have the same level of integrity. Let us assume, also, that before choosing a profession, everyone has the same level of integrity and that, therefore, their profession is the main determinant of their behaviour.

Figure 2 presents the merchant's model. M (the merchant) can choose, in each of his moves, a strategy of integrity (I) or one of fraud (F). Let us assume that the strategy of fraud brings large benefits in the short term, but prevents a merchant from continuing in his profession successfully because he earns a reputation as an untrustworthy person. Therefore, if we call B the benefit the merchant expects to get, each act of fraudulent behaviour will have a higher value than an honest act in each stage of the game:

$B_{12} > B_{11}$ , $B_{22} > B_{21}$ .... $B_{n2} > B_{n1}$

But the sum of the benefits that the merchant obtains when he can make another move due to his honest behaviour in the previous stages of the game is superior to what he would gain by being dishonest. That is:

$B_{11} + B_{21} > B_{12}$ ......$B_{n1} + B_{n+1,1} > B_{n2}$

FIGURE 2.- Merchant's model (repeated game)

$M_1$ $I \rightarrow B_{11}$ $M_2$ $I \rightarrow B_{21}$ $M_n$ $I \rightarrow B_{n1}$

F F F

↓ ↓ ↓

$B_{12}$ $B_{22}$ $B_{n2}$

The conclusion is clearly that integrity is profitable and the merchant who wants to maximize his gains will be honest. However, this does not seem to be the case of politicians as seen in figure 3, in which the game can only be played once. The economic agent here is the politician (P). As in the earlier case, we assume that

$B_{12} > B_{11}$

In this case, P has no incentives to follow the strategy (I) since the strategy which brings him more benefits is (F). Therefore, he will not behave honestly taking into account that good reputation has no value in games which are only played once.

FIGURE 3.- Politician's model (one-shot game)

$P_1$ $I \rightarrow B_{11}$

F

↓

$B_{12}$

Why do politicians find themselves in this situation? Smith' explains that a politician is not making contracts everyday and he can obtain large benefits in specific deals, with the result that the value of the loss of his reputation is less than the benefit obtained from his success in the short term. [17]

[17] The model is designed, no doubt, for a different world than our own, where the politician, at least in a democratic system, is constantly in the eye of the public so that he should think that the loss of his reputation would cost him dearly. However, many people still believe that today, as before, politicians do not stand out precisely for their integrity. See Albert and Cabrillo (2006)

That which we may call the politicians' game or the diplomats' game is a non-cooperative game because having a reputation for being honest and abiding by the law is of little economic value to the players. What is important to the economic agents in these cases is to achieve the best possible outcome in the short term. In one shot games, when the parties are faced with the option of pursuing a strategy of cooperation – in our case, of behaving honestly and abiding by one's word – and not cooperating – here the pursuit of immediate success – the parties will pursue the latter. The strategy pursued by a merchant who only realises a small number of commercial contracts, according to Smith, will behave similarly. The merchant who realises a large number of contracts everyday, however, will opt for a strategy of behaving honestly because this will render him the greatest returns in the long-term. This conclusion is well-known in game theory. Parties enjoy incentives to cooperate where they are involved in a repeated game without a specific deadline determining termination of the relationship (the latter is an important though certainly not a necessary condition for cooperation as it avoids the problem of backward induction). And this condition may be sufficient to explain why, though parties have the same objectives, it is possible to encounter very different strategies when the frequency condition is not present.

## V.- COOPERATION WITH DIFFERENT INSTITUTIONAL CONSTRAINTS: AN OPEN RESEARCH PROGRAM

Smith raised the dilemma associated with both types of strategies in a rather precise manner. He did not, however, offer institutional solutions for the problem. From the perspective of economic analysis of law, the next step would be the design of adequate rules for those cases where the pursuit of self-interest produces results contrary to the social optimum; that is to say, where the invisible hand does not work. One must bare in mind, of course, that the objective of Smith's text that we have discussed in the previous section was fundamentally to explain the different degrees of probity between various professional groups. Nevertheless, there can be little doubt that the argument would open a path of great interest for an analysis of appropriate institutional reforms, to further the functioning of different markets, understood in the broadest sense of the term.[18]

Different social groups offer different incentives for cooperation. There is no social group in which cooperation is more relevant than the family. Family members live in close proximity and have frequent contact, this preference for cooperative behaviour within the family as opposed to other social groups can be better understood. One of the most relevant of the various models that have been formulated is Gary Becker's 'theorem of the rotten kid,' which has given rise to much debate on the nature of cooperative behaviour in social groups.[19] This theorem basically establishes that, in the case of a family in which the father's conduct is in the interests of his two children $Ch_1$ and $Ch_2$, the selfish child - let us take $Ch_2$ - will not behave selfishly if, by doing so, the family income would decrease. His objective will be to maximize the family income because the father's reaction might worsen the situation of $Ch_2$ if the family income were to decrease. In other words, any member benefiting from belonging to the family group will try to maximize the income of the persons in the family and will internalize the effect of their positive actions. A striking corollary of the theorem establishes that, even for the envious child will be efficient to adopt a cooperative attitude to allow the family income to increase, even though in this way he will be favouring the welfare of his siblings that he would actually prefer to harm. Cooperative behaviour is thus imposed by the interests of each member of the family.

Quite different however are the principles on which modern societies are based. In this respect, it is interesting to recall Hayek's theory of what he calls "extended order", that is the market order, the social order of a modern free society. Hayek thought that the natural man living in a traditional society is unsuited to this extended order; and gives the example of the common notion that "cooperation is better than competition". In this order competition may be efficient, but to operate to the benefit of society, it requires that those

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[18] Unfortunately Smith did not continue to systematically develop these ideas, which would have permitted him to avail of a sounder model for the analysis of failures in theory of self-interest and possible solutions. One does encounter, however, some isolated references of interest. To give but one example – when in this book Smith spoke of the politician as "that insidious and crafty animal, vulgarly called a statesman or politician", he did so as a means to analyse politicians' behaviour in a very concrete case: the decision whether or not to adopt retaliatory measures when another nation imposes restrictions on international trade. After studying the issue Smith concluded that general principles bore little importance, given that the decisive factor was the skill of the politicians involved, who – and this is the important notion – are moved by "the momentary fluctuations of affairs." Smith (1776/1976), I. 468.

[19] Becker, G.S. (1991), 288-295.

involved observe rules rather to resort to physical force. "Rules alone –he wrote- can unite an extended order".[20] These rules have been developed through a long process of social evolution and are very different from the statutes sanctioned by parliaments to organize a social order under the control of political or interest groups.

The welfare state, for instance, is not part of this extended order and is based on the principle of cooperation; but it creates clear incentives for non-cooperative behaviour on the part of citizens, for at least two reasons. Firstly, the great benefits which groups can obtain by using political power for their own purposes. Strategies for acquiring income are inefficient for country's economy as a whole, but they may be very profitable for those that apply them successfully. Secondly, the individual advantages that may be reaped at the expense of others by acting as a free-rider, that is, by taking the benefits offered by the system while avoiding its costs. Not to pay taxes, to fraudulently receive unemployment benefit, etc., may be efficient from the point of view of the individual but these practices are very inefficient for society as a whole. Strangely enough, people do not always condemn this type of behaviour because the welfare state system, on the one hand, is opposed to the basic principles of an extended order and, on the other, is not governed by the principles and circumstances which would make such attitudes unsustainable in a traditional order. So institutions created to further social cooperation, that are efficient in a specific social model, may eventually become a source of anti-social behaviour if applied to more developed societies.

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