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COGNITIVE CONSTRAINTS AND REVERSIBILITY OF INTERNATIONAL ECONOMIC INSTITUTIONS. THE CASE OF THE EUROPEAN MONETARY SYSTEM

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Abstract : This paper builds on the case study of the birth and death of the fixed exchange rate system in Western Europe, prior to the launch of the Euro. The analysis of this case aims to highlight how "new" international economic institutions may suffer the processes of "preference reversals" and thereby implode. De facto, the paper focuses on the cognitive factors that are deemed to have played an important role in determining the originating decision-making processes in favour of a system of fixed exchange rates and, then, in determining the abandonment of that system. After briefly explaining events such as the "currency snake" and the "European Monetary System" (EMS), the paper highlights how processes of this nature are conditional on the extent of the limits of rationality of the decision-making agents, with the consequence of producing cognitive imbalances. These imbalances are determined by the "fuzziness" with which agents evaluate not only opposing objectives, in particular those of employment and the balance of payments, but especially objectives achievable in an intertemporal dimension (Walliser, 2008: ch. 4).
In fact, we illustrate how the actual inflationary differentials between the countries concerned determine the imbalances in the balances of payments. We also highlight how the policies to bring inflation under control can determine changes in the electorate in the preferences defined in the area of economic policies. The collapse of the monetary snake and the European Monetary System is representative of such a change in preferences. The conceptual framework of analysis used is that of temporary equilibria.

1. Introduction

Modern analysis of the formation processes of social and economic institutions is largely based, especially when using models based on the game theory, on the assumption that the emergence of a new institution or, if preferred, of a new rule of socially accepted conduct, is the result of a rational evaluation, i.e., a comparative evaluation of costs and benefits arising from the new institution and costs and benefits arising from maintaining the old institution (Buchanan and Tullock,1962). It follows that rational evaluation can also be the result of a comparative calculation of costs and benefits, extended on multiperiodal time horizons as appropriate, by virtue of which general agent, *j*, part of set, *N*, of subjects linked together by a defined tie calculates the convenience obtained in maintaining, or abandoning, a rule of conduct pursued until then, in respect of a new rule of conduct. This, in accordance with Bicchieri (1997: 21), who wrote, "rational choice theory defines action as the outcome of a practical inference that takes preferences and beliefs as premises". When referring to rules of social conduct, the choice of a rule is conditioned by the choices that the other *n-1* agents may make. This is highlighted, for example, by models resulting from the concept of "prisoner's dilemma", in which every agent, i , with $i=1,2,j\ .,n$, is able to make a comparative calculation of costs and payoffs arising from the strategies that may conditionally follow the strategies of the other $n-1$ agents.
The "computational capacity", is an important component of decision-making processes, both those of individual agents and those of collective agents. It goes without saying that the analysis of a collective agent's computational capacity (which may, for example, be the government of a state) leads to the area of the contracts theory, where the question of information structures of both the principals (voters) and of agents (governments) exercises a fundamental role, as well as leading to the area of collective choice theory (Buchanan and Tullock, 1962). Governments are called to take decisions, formally on behalf of the voters, based on an information universe, which in general does not necessarily coincide with one that voters are in possession of. Furthermore, it should be noted that the elaboration of objectives, synthesizable into a useful collective function, must take account, however, of the different preferences of the individuals who that same government represents, with the known difficulties, in the case of at least three objectives, and at least three agents (Ordershook, 1986 : 61) that are emphasized in Arrow's (1951) impossibility theorem. Finally, it should be pointed out that in choices relating to international economic institutions, if governments generally have an informational universe that is greater than that of the voters', it is also true that the information

universe is not necessarily complete, and therefore the decisions are made on the basis of bounded informations on the relation between such choices and the possible payoffs arising from them, under the constraint of a bounded computational capacity and significant cognitive distortions. I shall expand on this.
The problem associated with Arrow's impossibility theorem can formally be surmounted by imposing restrictive conditions to the structure of the collective utility functions of the voters of a country, reducing them to mono-argument functions, in this way the choice of strategy proposed in that country can be made through the voting system. Therefore, governments, called to negotiate monetary regulations, must identify the rule on which to agree, considering the constraints assigned them by their voters. International agreements have the purpose of regulating situations that will occur in the future; this is why the question of cognitive imperfections of the subjects involved is important. Indeed, because of these cognitive imperfections it will be difficult for them to make perfect forecasts on the future states of the world. In this regard, we recall Furobotn and Richter (2000: 180): "imperfect foresight has the effect of making it impossible to enumerate and contract upon conceivable contingencies that the future will bring".
A possible solution to the problem of identifying equilibria solutions in the multi-periode context, is the use of the temporary equilibrium method (Furobotn and Richter, 2000: 180), by virtue of which it is possible to represent, with sufficient logical coherence, the changes which may occur in the choice of strategies. In fact, the computational limits and cognitive distortions of both principals and agents, may sometimes result in the failure of the ex novo rules established and a return to the rules that were changed. This was the case of the monetary union project, from the end of the Second World War up to the collapse of the European Monetary System (EMS). This matter may suggest a kind of institutional reversibility, at least during the period concerned.

2. From the Monetary Snake to the EMS. A case study

Standard economic literature on the costs and benefits of monetary cooperation strategies on an international level is infinite, not to mention, that which is dedicated to examining the birth of the Euro. Broadly speaking, in the literature, the rules that are put in place based on a money market functioning, performing forms more or less driven by cooperation between different governments, are viewed as constraints chosen by agents based on preferences given and defined on the space of economic policy actions, *K*. Nevertheless, in the case of international monetary institutions, rarely is the possibility referred to that, a process of interaction (with some form of circular causation) occurs between cognitive processes and the choices of institutions, although this interaction - on a general level- is beginning to become the subject of more detailed analyses (Engel and Weber, 2007). I believe that from this interdependence the possibility should derive that forms of "preference reversal" come about relative to the rules adopted. The reason I focus attention on the events resulting from the process of the European monetary integration is that these were, from 1972 to 1992, a significant example of how the propensity to monetary cooperation between European countries met with real failures. These failures will be analyzed in terms of dynamic inconsistency between actual plans and behaviour in the future, paying attention to cognitive factors that may contribute to determine this inconsistency. A previous paper of mine (Mistri, 2007) shows how the emergence of a perfectly integrated European trade system involves the consolidation of an Inter-European monetary and financial system focused on the stability of exchange rates and monetary policy regulations that can turn into genuine "constitutions". This is a central issue in discussions that were held in the 1970s and 1980s in Western Europe; in these debates, there were two intertwining issues, namely that of achieving full employment and that of the exchange rate stability between European currencies. This is a duplicity of objectives, which, for example, emerges in the Werner Commission report published in 1970. According to the Werner Report, the basis of a monetary union must be the total and irreversible convertibility of the currencies and, therefore, the elimination of the exchange rate fluctuation margins obtained through the irrevocable fixing of parity rates.
In the Werner report, a hypothesis of the creation of a single currency, as an alternative to the hypothesis of fixing foreign exchange rates, had already been proposed. At that stage the two strategic options suggested were considered theoretically replaceable by one another in the sense that it was hoped that the same effects would manifest themselves, albeit with the conviction that a system of fixed exchange rates could not have borne, in the long term, the pressure on the economic policies of individual governments that would have occurred both as a result of unfavourable events and following the resurgence of new and stronger national propensities to inflation.

The Werner Commission, at the time, already revealed a serious concern regarding the ability of national governments to keep faith with commitments made on that matter.
At the same time, it was apparent that the option of a single currency would not have received the full consent of governments, which, however, were worried about the adverse effects, at least in the medium/long term, that the policies necessary to maintain a single currency would have on employment levels in each country. Studies on so-called "optimum currency areas" Mundell (1961), had identified the preconditions that could ensure the proper functioning of an integrated monetary market. However, to many analysts these preconditions seemed unrealistic given the structure of national labour markets and the diversity in national propensities to inflation. For example, following Meade (1952), Dehem (1972) denied that the national governments knew to resist the political consequences of unemployment, which he counted among the negative consequences of a monetary union, at least in the short term. Among other things, Dehem emphasized that the sufficient conditions identified by Mundell, such as labour and capital mobility within the area, could not be met in Europe.
The same debate on optimum currency areas revealed how the utility functions of governments may be focused on two possible strategic options: a first option focused on the rule of "floating exchange rates", aimed at achieving higher levels of employment in the short term; (b) the second option focused on the rule of "fixed exchange rates", designed to maintain exchange rates stable between their European currencies. In short, it is possible that governments adopt a rule that is a mix of the two previous rules, aimed at maintaining exchange rates sufficiently stable within a determined fluctuation band, in order to reconcile the possibility of achieving higher levels of employment with what, to use an oxymoron, might be called a "flexible" exchange rate stability. This latter rule, used in the case of the EMS, appears problematic as it ends up being unstable, so much so as to bring about the abandonment of the objective of exchange rate stability. The particular attention paid to the objective of full employment *versus* that of currency stability was also due to the crisis triggered by the 1973 and 1974 oil shocks; in fact, in debates kindled in the 1970s in connection with the approach of the optimal currency areas, it emerged that the objective of full employment and that of the exchange rate stability end up appearing, essentially, as alternatives.
In concrete terms, the choices of the Commission and those of the governments unravel amidst Keynesian propensities towards more active policies concerning employment and the more "orthodox" calls to the fight against inflation and the commitment to the exchange rate stability. In this respect in 1972, the governments of the six founding countries of the European Common Market (ECM) gave life to a system of joint fluctuations of their currencies against the dollar, with a determined fluctuation band (monetary snake); this system lasted until March 1973. After a period of substantial currency anarchy in Europe, an attempt to revive a monetary system based on some form of cooperation between governments was made. In 1979, the European Economic Community (EEC) gave life to the European Monetary System (EMS), with the objective of creating a common currency, but based on a system of floating exchange rates within a tight fluctuation band. However, even the EMS entered in crisis in 1992 and both Italy and the UK abandoned it.

3. From one institution to another. The role of cognitive disequilibrium

The fluctuation trend of the choices made, in the period concerned, by the European governments in terms of policies concerning currencies, can be regarded as an example of the *institutional crisis* mentioned by Aoki (2001: 241), according to whom, the transition from a system of rules to another should be seen as the result of a general *cognitive disequilibrium*; in other words, the result of a lack of consistency between structural results expected and actual results. In connection with this Aoki (2001: 239) wrote "when an existing sets of rules does not produce satisfactory results relative to an agent's aspirations, the agents may start questioning the relevancy as well usefulness of their own subjective games".
In particular, when such an imbalance manifests itself, which can no longer be reabsorbed by the protection mechanisms of the system of dominant rules, the agents can be induced to review the rules adopted earlier and to seek some entirely new ones. Aoki assumes that the search for new rules, within the framework of a problem solving based approach, can be implemented by Schumpeterian type players whose actions are directed towards finding solutions to problems which do not seem to be able to be solved with existing institutions (op cit.). In Aoki's vision the loss of consistency between results expected and actual results, in general, is a consequence of the dynamic effects resulting from radical changes in the outer environment to

which the adaptation processes of the behaviours adopted by the agents themselves do not necessarily correspond.
At the base of the issues cited by Aoki, there are also however, cognitive factors determined by the difficulties that the agents (in our case the governments and central banks of the countries concerned by the currency coordination policies) have in assessing the dynamic factors of the economy. The dynamics of the fundamental economic variables are not accurately predictable and this depends on both the imperfect knowledge of agents and from cognitive constraints that limit their computational ability (Simon, 1972). To this can be added that, within the general cognitive disequilibrium, the difficulties of understanding the real meaning to be allocated to signals coming from counterparties also play a role. It is therefore possible that an institution's choice made in the initial phase of the period of the finite time, Δt_1, results in regret in the final phase of that period (Loomes and Sugden, 1982). In some cases, this regret may bring the agents to review, in the following period, Δt_2, their own decisions to the point of using a different rule.
The assumption that I make here, to a certain extent, is in line with the analysis carried out by Hodgson in "Economics And Institutions: A Manifesto for a Modern Institutional Economics" (1988). Hodgson's recall to the role played by cognitive processes in the formation of social institutions is to be wholly recuperated for analysis of the formative processes of international economic institutions, considering the preference systems of voters and governments. I have already affirmed that one and the other are able to derive a system of preferences, defined on the space of actions of economic policy, *K*. For operational simplification, it can be assumed that the preferences of a national government coincide with the preferences of its electorate; in the same way that it can be assumed that the knowledge and beliefs of a national government coincide with the knowledge and beliefs of its electorate.
In determining the objectives and constraints, the agents, to a certain extent, are inspired by the theoretical models dominant in each phase of the period concerned: (a) in the first phase they are inspired by Keynesian type models, with their function of collective preference for two arguments in which dominant weight is assigned to one of the two - full employment; in the second phase they are substantially inspired by monetarist type models, with their function of collective preference for an argument, or objective, i.e. the exchange rate stability. Nevertheless, the problem of the computational and information limits of agents remains to be solved; Sargent (1993), amongst others, spoke of these computational limits, while on the question of incomplete information in monetary policies we refer you to Issing and Tristani (2005). Sargent considers that the concept of bounded rationality should be introduced in macro-economic analysis as an operational strategy necessary to exit from the logical contradictions of models based on rational expectations. In fact, rational expectations impose two conditions on economic models: (a) the Olympic rationality of individuals; (b) mutual consistency of the perceptions concerning the outer environment. Sometimes the idea of rational expectations is explained informally assuming that it reflects a process in which individuals, through observation, learn to eliminate their forecasting errors. In this respect Sargent (1993: 21) notes that the formal estimation and inferential procedures of the econometric models which incorporate the rational expectations assume that the theoretical agents know subjects and dynamics that the econometricians restrict themselves to estimate.
There is, therefore, an asymmetry between the forecasting capacity of the theoretic *homo economicus* and that of the model that should describe the behaviour. Sargent considers that it is possible to eliminate the asymmetry using the principle of bounded rationality, with which the need to impose the condition of mutual consistency of the perceptions of subjects is eliminated. The consequences of abandoning the hypothesis of rational expectations are immediate if you think, for example, that the theoretical monetarist approach structure and the model of optimum monetary policy depend largely on this hypothesis. For example, following this approach Kydland and Prescott (1977) claim that, in the presence of rational expectations, the optimal policy is one that sets, a priori, a rule that requires public action in subsequent periods with respect to the rule fixed initially, preventing them from changing later. If, however, one were to assume, as I do, that the expectations are conditioned by the computational limits of agents and by incomplete information, then it is clear that those expectations may not be "rational" in the sense of Munth (1961). It therefore becomes difficult to maintain, in time, the rule set initially. In this way, the consequences on determining an optimum time horizon are immediate.
According to Sargent (1993. p 22), to eliminate the asymmetry that exists between what *homo economicus* knows and what economists estimate, the limits that the economist is subject to should be assigned to the very same *homo economicus.* For example, *homo economicus* could be likened to the "classic econometrician", who is certain of the model but is uncertain on the values to be allocated to the parameters. In particular, Sargent's analysis, which reverts to Kreps (1990), assumes that one element of weakness in the

rational expectations approach is the fact that this approach is mainly oriented to defining the environmental conditions that lead to a point of equilibrium, known as the attractor point. However, as Kreps noted (op cit), developments of the game theory show that in some cases there may be a multiplicity of equilibria and therefore players must choose from amongst these equilibria; the question to then put is in which way players choose one equilibrium over another. In this regard, Kreps believes that the answer should be sought in the behaviour of individuals who move in conditions of limited rationality, therefore learning from past experience and adjusting their strategies from time to time. The reflections of Kreps and Sargent probably have more of a “questions” than “answers” flavour. However, for our purposes, the answer to the problem presently outlined should be sought in the fact that players of an imaginary game of strategy are inclined to use techniques that are intended to resolve a "current" coordination problem using substantially analogous schemes that do not always ensure a sufficient capacity for "processing" the information available in order to resolve "future" coordination problems.

4. Bounded rationality and chaotic dynamics in the 1970s and 1980s

Thus, the computational bounds of agents together with incomplete information, in a context of strategy games can lead to the failure of finding a stable equilibrium. Therefore, those same agents could challenge an equilibrium found in such a context, once the results have been verified, in the event that they are unsatisfactory and give rise to “regret" phenomena. As will be seen further on, I make the emergence of regret phenomena dependant on the logical structure of bounded rationality and, in particular, the ratio of chaotic dynamics that have arisen in the market and the consequent difficulties to process the information in a coherent and rational way. In this specific case, it should be noted that the difficulty of obtaining consistent forecasts of the evolution of economic and financial systems of the main European countries, obliges the governments and the national central banks to make forecasts in the short/medium-term subject to revision. This is an approach that, in fact, may find its theoretical framework of reference in a temporary equilibrium scheme.

Thus, bounded rationality and temporary equilibria represent the conceptual framework to interpret the situation of the European economies that manifested itself following publication of the Werner Report.

The events that happened, for example, between 1968 and 1974, made it impossible for any European government and for any European Central Bank to make reliable forecasts in relation to the currency and labour market dynamics. In 1970 convertibility of the dollar against gold fell. The 1973 and 1974 oil shocks triggered inflation first from the cost side and subsequently from the demand side. The short/medium term being the only reasonable term in which to frame the reaction strategies of the governments and central banks of Western Europe. In this context, it would not have made sense to speak of equilibria in the long term nor of monetary policies that would necessarily have had as their conceptual reference such a long-term equilibrium. Amongst other things, the scheme to which I refer assumes that the imbalances between two or more balances of payments are determined by the manifestation of differentials in national inflation rates. On the other hand, I hypothesize that national levels of labour productivity remain sufficiently constant in time because of the continuing inertial forces of an institutional nature (the role of unions, structure of public expenditure), whereby no adjustments in production scales will manifest themselves in any of the national production systems. The lack of adjustment of this nature determines, for each period of time, the equality between the long-term national supply function and the short-term national supply function. It follows that it is possible to consider the dynamics of national economic systems as a succession of temporary equilibria that can be modified only by any changes in the national rates of inflation.

The inflationary dynamics that intensely affect the economies of some European countries are complex, in that, the causes of the inflationary processes that have plagued the economies of the main European countries in the period concerned are manifold. Amongst them, we can identify the following: (a) inflation from costs, following the oil shocks; (b) inflation from costs arising from wage increases exceeding the average labour productivity gains; (c) inflation arising from asymmetries in the bargaining power of various social groups and pressure groups, with a consequent increase in public spending and debt. These are inflationary processes that results in the growth of prices expressed in monetary terms.

The complexity of this phenomenon and all the intertwining causes, may explain, at least to some extent, the governments’ and European central banks’ oscillation between a propensity to use expansion of aggregate demand policies and a propensity to use inflation containment strategies. The two policies, as demonstrated,

characterize objectives that are not easily compatible and correspondingly identify two fundamental exchange rate models.
As seen, the choice of establishing the EMS is aimed at achieving the objectives of full employment and exchange rate stability, without excluding an attempt to mediate between them. There is of course the possibility that, in time, real reversals in preferences make themselves known. These changes can result from an error in estimating the short and medium-term effects that a deflationary policy can have on the welfare of the voters. In other words, it is possible that the governments underestimate the medium-term negative effects and underestimate the short-term positive effects of such a policy; these are known respectively as the *overconfidence* and *underconfidence* phenomena. For this reason, it may also be useful to speak in terms of "temporary equilibria", because in this way it is possible to adequately represent the sequence of stages that such a process has gone through with the corresponding changes of preferences to the rules of conduct.
In the field of international monetary policy, the problems of bounded rationality of agents (governments and/or European central banks) may implicate those fluctuations in the choice of behavioural models referred to. It may be useful to refer to Issing and Tristani (2005) who expose the existence of a gap between economic theory models and the problems of the real world with respect to monetary policy management. Referring to the European monetary integration, Issing and Tristani bring to light that "there are episodes where the level of uncertainty reached exceptional heights and the limitation of knowledge emerged most strikingly. However, extensive one's knowledge of the economy before such events, it is possibly irrelevant afterwards " (2005: 14).

5. The monetary regime and the set of objectives

It must necessarily be assumed that the stability of a system of fixed exchange rates is based on the capacity of individual governments to maintain the exchange rate values between the respective national currencies. For this to be the case, the economic, fiscal and monetary policies of individual governments must be able to ensure adequate control of national inflationary dynamics. If there are no supranational tools to maintain this control, it must be entrusted to the choice of individual national governments. The significant difficulties in the European monetary integration process based on fixed exchange rate systems resulted in structural imbalances in the balances of payments. One of the causes of these structural imbalances is represented by diversity in national propensities to inflation. The propensity to national inflation concisely reflects the choices that each national government makes in the area of economic policy. These choices reflect the structural differences that exist between the collective preference functions of the individual national governments in their public spending policies, tax policies, and so on. The creation of a fixed exchange rate system consequently entails that the individual governments agree to adopt monetary, fiscal and economic policies capable of guaranteeing the convergence of national rates of inflation to values that fall satisfactorily around a value negotiated previously. Moreover, it goes without saying that the governments of countries with high inflationary propensity should be able to ensure stability of the equilibrium that might appropriately be reached, creating in the event, institutions that "tie their hands". (Giavazzi and Pagano, 1988). In fact, the governments of countries with high inflationary propensity are not always able to guarantee the commitment made, especially if they are called upon to mediate between two short to medium term objectives that are deemed conflicting, i.e. the objective of full employment and exchange rate stability. It follows that the choice and permanence of one or other system of exchange rates derives from the structure and the evolution of the functions of collective preference of the individual governments that are committed to building an integrated monetary area. We saw, in the period of the history of the European monetary integration considered, that the preference functions of policies concerning currency usually had two objectives, in the sense that they tried to incorporate both objectives of full employment and exchange rate stability. These are objectives, which, especially in the short/medium term, are difficult to reconcile since the aim of full employment, particularly in the short/medium term, may increase the national inflation propensity, generating an imbalance in the balance of payments. In fact, the trade-off between inflation and production (employment) can be found on every short-term aggregate supply curve. To reduce inflation it is necessary to reduce the level of demand negatively affecting production levels, generating a recession that impedes wages growth through an increase in unemployment.
In general it can be assumed that a generic government, Gj, is called to derive a utility function, u_j, defined on the space of institutional rules, K, such that $u_A : K \rightarrow R$, a function that incorporates the two fundamental

objectives of full employment and exchange rate stability. I have indicated these objectives with x_1 and x_2, so that the utility function is of a multi-objective kind (Goodwin and Wright, 2004: 123 et seq). It may be expressed as $u_j = (k_1 x_1 , k_2 x_2)$, where k_1 and k_2 are the possible values, or weights, which are assigned to the two "rules", or objectives. The problem that the government has to resolve is that of allocating the weights, k_1 and k_2 to the two objectives; standardizing to obtain $k_1 + k_2 = 1$. The weight assigned to each objective reflects the system of preferences of economic policy of the government. For example, for a government to allocate $k_1 = 1$ and $k_2 = 0$ means it believes the objective of full employment to be fundamental and the exchange rate stability irrelevant. By contrast, where a government allocates the values $k_1 = 0$ and $k_2 = 1$ to the weights of the two objectives, indicates that the government's primary objective is the stability of the exchange rate and that full employment is unimportant (or at least unachievable). Now, although generalizing, we can say that in the first case we would have a government of Keynesian economic culture, while in the second case it would be a government of monetarist economic culture. At the same time, we must not forget that there may be a case where a government intends to implement a strategy intended to adapt the objective of full employment to that of exchange rate stability, using a system of fluctuating exchange rates around the rate of exchange of reference. In this case it could be said that $0 < k_1 < 1$ and $0 < k_2 < 1$, with the constraint $k_1 + k_2 = 1$. This last case could be that of the monetary rules used at the time of the EMS.

The allocation of weights in the form described just above may suggest that the two objectives are independent; in fact, in the case of a Keynesian type approach, they may be parameterized to a third alternative, that is, the national inflation rate, ${}_j p'$, in the sense that it is assumed that the movements of such a rate of inflation are positively correlated to movements in the level of employment and negatively correlated to movements in the balance of payments. In short, we can say that the exchange rate, e, is a function of the relationship between the national inflation rate, ${}_j p'$, and the rate of inflation of the partner countries, ${}_w p'$; equally briefly, we can assume that the level of the national income, Y, and therefore the level of employment, L, are functions, all other conditions being equal, of the national inflation rate, ${}_j p'$. This can be written as:

[1] $e = f({}_j p' / {}_w p')$

[2] $L = g({}_j p')$

If you assume that ${}_w p' = cost$, then the system represented by the equations [1] and [2] can be solved parametrically with respect to ${}_j p'$, i.e. the national inflation rate. It is then possible to derive an equation that expresses the relationship between the level of foreign exchange and the level of employment in a given country, whereby an increase in the value of the national currency in respect to a foreign currency negatively influences the national employment level.

In a more strictly monetarist approach, instead, we assume that movements of the rate of inflation have consequences on the balance of payments and do not have lasting effects on the levels of employment. In this case, the only objective to be assigned a weight, and more specifically the value 1, is x_2. All other conditions being equal, it follows that the key variable is the rate of inflation so that if one country, in a given period of time, shows an inflation rate higher than that experienced in other countries, the balance of payments is a deficit that can be eliminated only if adequate monetary policies and fiscal measures are adopted. This strategy is reverted to when it is desirable to adopt a system of fixed exchange rates. Having assumed that the variable around which the strategies of the governments involved in a monetary integration project revolve is the national inflation rate and, reverting to [1], we observe that the parity rates will be maintained only if ${}_j p' = {}_w p'$, or at most, if the national inflation rate significantly converges on the inflation rate of the partner countries, i.e. ${}_j p' \rightarrow {}_w p'$. Of course, this applies to countries that show structural deficits of their balance of payments and who, therefore, are called to implement deficit recovery policies.

With reference to the case studied (EMS), such conditions can be outlined assuming the countries in the integrated monetary area concerned form two groups, namely the group of countries in surplus of their balances of payments and the group of countries in deficit of their balance of payments. The first countries show low inflation propensities and the second show higher inflation propensities. To simplify, the first group of countries is represented by a single country-type just as the second group of countries is. Therefore, the problem is reduced to the relationship between the exchange rates of the two country-types and attention focuses on the inflation recovery strategies adopted by the country with higher inflation and in the keeping, in time, to such strategies.

6. Controlling inflation, cognitive biases and decisional failures

In the situation formulated above, the country that must implement measures to adjust its balance of payments is the country with greater inflationary propensity indicated with *A*, whose government, G_A , must engage in a programme focused on the objective of reducing the national inflation rate, making it converge on the country with the lower rate of inflation. This is a commitment that G_A makes when drawing up a programme, usually multiperiodal, which entails estimating both the expected value of some fundamental economic data and the capacity of G_A to keep to its own programme. The estimates of G_A are based on a set of information conditioned by the nature of the inflationary process that characterizes the economy of *A* and, therefore, by the operations that the government will have to implement. It is assumed that the conditions in which G_A moves are characterised by bounded rationality and therefore the forecasts that each Government makes will have a limited time horizon and the multiperiodal plans will take place in a sequence of periods. At the same time, it can be assumed that the forecasts of G_A are affected by cognitive biases that entail inevitable forecasting errors. We know from cognitive science that one of the causes of forecasting errors can be the overestimation of low risks and the underestimation of higher risks (Gigerenzer, 2007: 66).

In the finance field, forecasting errors are largely also made by experts to whom, in many cases, a kind of "overconfidence in predictions" (Hilton, 2003:277) can be attributed. It has been noted that "people are more confident, for example, in the accuracy of others' responses than in the accuracy of their own responses" (Eply, 2007:247). Nor can we ignore the fact that agents and experts tend to overestimate their own ability to govern the processes that they themselves set in motion (Rachlinski, 2007: 577). On experts' forecasting errors we refer you to Camerer (1981), Russo and Schoemaker (1991). In regard to balance of payments, governments rely largely on the experts of central banks and other international economic organizations, adding their likely forecasting errors to the forecasting errors that governments themselves make in terms of reliability of their future conduct. In support of the theory that economic and monetary policy strategies may be affected by assessment and forecasting errors we refer to Phelps (1983) who showed that fully rational expectations are not particularly credible in situations where optimum individual actions depend not only on the beliefs of the individuals themselves, but also on their belief on the beliefs of others. A forecasting error that a government can make is on the differential that may occur in the short/medium term between productivity growth and growth of the monetary base. It was Friedman (1959) himself who emphasised how it is not possible in the short/medium term, by the authorities which oversee economic policy, to accurately forecast the relation between money stocks, prices levels and the level of the national product.

The monetary base can grow at a greater rate than the average productivity of the national economic system if the government is induced to create liquidity and, if anything, to inefficiently allocate the resources it receives from the fiscal system, directing that allocation to the attainment of adequate social consensus in the short/medium term. Harrod (1972: 44), dwelling on the sociopolitical bases of inflation in the period concerned, at that time said "the new wage-price explosion is altogether unprecedented….. the causes of which are sociological". According to this approach, inflation is analysed essentially as a monetary phenomenon (Laidler and Parkin, 1975:741). Indeed, according to Friedman "inflation is always and everywhere a monetary phenomenon..... and can be produced only by a more rapid increase in the quantity of money than in the output" (Friedman, 1970:24). However, if inflation also expresses itself through monetary dynamics, then from a national inflationary process continued over time, the strength of contractual rules established in the national labour market must be identified, beyond the veil of monetary policy. However, if the government of a country that has a greater inflationary propensity compared to other countries, decides to adopt a fixed exchange rate system, it does so on the basis of being able to estimate the immediate and future advantages arising from the stability of its currency against the immediate and future disadvantages related to the choice of such an economic policy (reduction of the growth rate of employment).

With reference to the case of the EMS, Paul Krugman (1995: ch.7) notes that the European governments with high inflationary propensity committed an error in assessing their ability to politically manage the consequences of structural rigidities in the national budgets. In fact, according to Krugman, the planners of the EMS trusted in the theories according to which unemployment would be eliminated thanks to the flexibility of prices and wages obtained with operations that were assumed politically inexpensive; but this did not happened. Thus, there is a sort of asymmetry in the estimation of expected results; an asymmetry analogous with what is normally called "myopia" and arising from the tendency of individuals to act in the light of their short term interests instead of extending their time horizons to the maximum (Elster, 1992: 35).

As Zaleskiewicz (2006: 712) noted "psychologists have shown that most people tend to overestimate the likelihood of positive outcomes and underestimate the likelihood of negative outcomes". This is a phenomenon that cognitive psychologists call myopic discounting. Recalling Winston and Woodbury (1991), who, in turn, refer to Strotz (1956) said, "a myopic discount function 'overvalues' the more proximate satisfactions relating to the more distant ones [….]. With a myopic discount function, their relative present values do depend on the time perspective τ from which this valuation is made" (Winston and Woodbury, 1991: 328-9). All the more reason that the asymmetry in estimations is reinforced by the fact that the positive effects seem to materialise in the proximate time period, termed Δt_1 , while the negative effects seem to materialise in a more distant period, termed Δt_2 . A little like the case of someone who is in debt and underestimates the difficulty they will have in the future to honour the debt.

7. Inflation targeting and myopic utility functions

Underestimation of the negative consequences expected in the subsequent period, Δt_2, of an action carried out in the current period, Δt_1, leads to behaviour that manifests anomalies, in respect to the principles governing Olympic rationality, amongst which the stability of preferences in time is the assumed focal point, characterised by a discount rate that is constant in time. (Klochko and Ordershook, 2005: 4). In this paper, however, it is assumed that the preferences defined in the space of economic policies, and amongst these those of exchange rates, can, due to the effects of agent's forecasting errors and the effects of regret, change what may occur in the period following that in which an economic policy decision was taken.

We know that a country with a structural deficit of its balance of payments, at least in the short/medium term, must implement a policy of inflation control if it wishes to maintain its exchange rate stable. In a slightly simplistic way, it can be expressed as deflationary policies; in actual fact, the concept of deflation is a little ambiguous, if by deflation, a pure and simple decrease in the general level of prices (Siklos, 2005) is intended. This concept can be supplemented with a policy geared to progressively reducing the growth rate of prices; such a policy has, de facto, the nature of inflation targeting. In its "powerful" version, inflation targeting consists of establishing mandatory rules to control inflation. In the "weak" version, it consists of establishing a framework to derive a flexible or discretionary monetary policy (Bemanke et al, 1999:4). It goes without saying that an inflation targeting policy must be based on an adequate understanding of the forces that determine inflation and, above all else, the cause of the (positive) inflation differential of the country that shows the balance of payments deficit. We suppose this to be country *A*. From a short/medium-term perspective, the changes in the general level of prices in *A* are conditioned, ceteris paribus, by the relationship between wage dynamics and the dynamics of average labour productivity. In this case, inflation is substantially determined by social and institutional factors, i.e. by the wage negotiations between the social partners and the rules of tax policy and public expenditure management on the part of G_A.

As is known, a scheme designed to represent the inflationary process of a country open to international trade is that which is based on the Scandinavian inflation model (Kierzkowsky,1976). In this model, the key sectors of national economies are divided into two main categories, namely the category of sectors that compete in the international market and the category of sectors that do not compete, which are protected.

In the standard Scandinavian model, it is assumed that in the sectors open to international trade, characterized by higher levels of average labour productivity, the wages tend to grow faster than wages earned in protected sectors, characterized by a slower growth of average labour productivity. In fact, the Scandinavian model is intended to represent a process of imported inflation by the stimulus that the wages of the most dynamic sectors exercise on the wages of less dynamic sectors. The Scandinavian model however belongs to the broader family of structural inflation models (Frisch, 1983: 5), in which the rigidity of wages in the low growth sectors of the average labour productivity, plays an important part. However, I believe we can reverse the hypothesis that is the basis of the relationship of dependency of the wages of low-productivity sectors from the salaries of the highest productivity sectors, assuming the wages of the first sectors (such as public employment, some types of professions, some commercial activities) are considered "independent variables", whilst the salaries of open sectors are considered dependent variables. This happens, in particular, if the recipients of wages of low-productivity sectors are able to influence policy decisions on the allocation of the national income.

In this case, the growth rate of wages is parameterized on the wages of the protected sectors and is independent of the growth rates of productivity in the sectors concerned. This leads to an inflationary gap determined by the differential between the rate of growth of the average level of wages and the rate of

growth of average labour productivity. The structural characteristics of such a labour market reflect the structural features of *institutional relations* governing the negotiation of pay levels. It follows that an inflation targeting policy should be accompanied by an income policy, intended however as a policy capable of linking the rate of wage increase of the protected sectors to the rate of increase in labour productivity in these sectors.
In other words, it would be a policy that is able to affect the national income distribution mechanisms, altering the previous structure of that distribution. It supposes a situation of fixed exchange rates and assumes that the government implements a policy aimed at redressing the balance of payments that is in deficit because of a positive differential between the growth rate in wages and the growth rate of average labour productivity that is generated in Δt_1. In the period considered, such a policy generates specific cognitive dynamics in monetary recipients; dynamics that can lead to the reversal of preferences between exchange rate stability and inflation reduction. Reversing the preferences, or inconsistency between plans and effective actions, is an area of investigation on which economists have measured themselves and cognitive psychologists offered economists some important models of interpretation of the phenomenon (Kahneman, 1994). The diversity of models is a consequence of the different ways in which cognitive processes intervene and through which the subjects interpret and represent the phenomena that condition their decisions (Hsee, Zhang and Chen, 2007). Of particular interest is an interpretative scheme called *impact bias* (Frederick and Loewenstein, 1999; Kahneman, 2000; Wilson and Gilbert, 2003). The impact bias can emerge when agents, after having completed an action, change the expectations relative to the effects of this action. In contrast, in the case of negative consequences expected in Δt_2, it can produce, in Δt_1, an underestimation of the consequences. Only when the agents have reached Δt_2 can they revise their opinions on these effects and modify the weights of the arguments in the utility function.

8. The problem of choice in temporary equilibria

Just above, reference is made to the features that an economic policy should have that is geared to ensure - through the governance of inflation- the exchange rate stability. Of course, the effects of this policy should be considered in their own time dimension and can be divided into two groups of effects: those in the short term, and those in the medium term, according to an approach based on the role of bounded rationality, where there is no room for long-term analysis. The short-term effects are correlated to monetary measures aimed at exchange rate stability, while those in the medium term are manifested through a reduction in the level of employment. Of course, the consequences of an eventual adaptation of the real economy to the new governance of inflation have not yet manifested themselves.
In fact, transformations of the real economic system are subject to inertial forces that will manifest their effects in a longer time period, beyond the short term. It can therefore be said that it is the positive effects, which the deflationary policy produces on foreign exchange, that are mainly emphasized in the short term, while in the medium term, it is mainly the negative effects on employment levels that are emphasised. As it is the positive effects nearest to the time with which the decision maker draws up his plans, the result is an overestimation of the positive effects and the underestimation of the negative future effects. The distinction between the short and medium-term effects allows subdividing the timeliness within which the function of collective utility of G_A in more periods, is expressed. For simplicity let us suppose that there are two periods i.e. Δt_1 and Δt_2. In Δt_1 the decision maker G_A is having to assess in particular, the positive effects of stabilization of the exchange rate, overestimating them; he therefore assigns a high enough value to weight k_1 and underestimates the negative effects that occur in Δt_2; and consequently will assign a relatively low value to weight k_2.
If, on first inspection it immediately appears that it is possible to represent, in a more formalized way, the transition from one institutional condition to another, making recourse to an approach that recalls the temporary equilibrium scheme, it should be noted that there are some differences between the temporary equilibrium approach of Lindahl-Hicks (Lindahl, 1929; Hicks, 1939), subsequently formalized by Grandmont (1988), and the scheme that I here present. However, the unifying element between the Lindahl-Hicks-Grandmont scheme and that which is used in this work, is that the decision maker, G_A, takes his decisions sequentially in time and that these decisions cover two distinct periods, with the possibility that the agents modify their preferences from one period to another. Using the temporary equilibrium approach,

representation of both the situation that has characterized the period of stabilization of the exchange rate and the situation that has characterized the period successive to exiting from the EMS, is immediate.
The transition from one period to the other is therefore marked by the change of rules, consisting of a change in weight of the strategic objectives that express the function of the collective preference of G_A.
We assume G_A must maximize a defined expected utility function, as mentioned, on the possible strategies, K, sub-divisible into two spaces, K_1 and K_2, where K_1 represents the specae on which the strategy to promote full employment takes its values, and K_2 represents the space on which the strategy to encourage the exchange rate stability takes its value. These values are defined on the partition of the real numbers that range from 0 to 1; each basket of strategies used by G_A is definable on the space identified by the Cartesian product $K_1 \ X \ K_2 = A_i$, where $i=1,2$ show the periods concerned. A_1 therefore indicates the basket of strategies in Δt_1 and A_2 the basket of strategies planned in Δt_1 for Δt_2. For the period Δt_1, having been given a signal $s_1 \in S_1$ the government, G_A, chooses a strategy a_1 in A_1. Furthermore, in Δt_1 the government can choose a plan represented by a measurable function $a_2(.)$ from S_2 in A_2, which describes the choice $a_2(s_2)$ that they intend to make in Δt_2 if estimating the signal s_2 in that period. The constraints which G_A will face may depend on its current and future environment and from the action chosen in Δt_1, and are represented by $a_1(s_1) \in \beta_2(a_1, s_1, s_2)$. G_A must maximize a intertemporal utility function. In fact, the strategy utility function becomes a function of expected utility, $u(.)$, in the sense of Von Neumann-Morgenstern (1944), which is a real variable function defined on the connected space of strategies. It follows that $u(.)$ determines a complete pre-order on that space that depends entirely on the order of the preferences of G_A. The decisional problem of G_A is to describe a choice between a simultaneous action to be carried out in the current period and a plan to be implemented in the successive period (Grandmont, 1982:884).
Therefore, G_A makes a prediction that takes the form of a distribution probability on S_2. It can then be defined as an expectation function, ψ, that takes its values on the space of the probability functions $M(S_2)$ on S_2. Therefore, G_A, because it knows s_1, will execute both the choice of a_1 and that of $a_2(.)$ so that the distribution of probability induced on the space of the relations of preference, R, maximizes its preferences.

$$[3] \qquad v(c_1, c_2) = \int_{S_2} u(\lambda(a_1, a_2(.)))d\psi(s_1)$$

Where λ is a suitable parameter, while $a_1 = k_1 x_1$ e $a_2 = k_2 x_2$.
The baskets of possible strategies, a_i, for each period are parameterized with respect to the weights assigned to their objectives. We imagined that G_A would increase the weight of the policies to contain inflation, and therefore, following what was said above, it is considered that it intends to plan, for Δt_2, a decrease in the weight of k_1 and an increase in that of k_2;, namely altering through the change of weights, their preferences of strategies. By way of an example, imagine that in [3] a_1 and a_2, in Δt_1, have the following structure

$$[4] \qquad a_{1,1} = (0{,}5\, x_1,\ 0{,}5\, x_2) \qquad a_{2,1} = (0{,}2\, x_1,\ 0{,}8\, x_2)$$

The diversity of the structures of a_1 and a_2 shows that G_A intends to strengthen, in Δt_1 for Δt_2, the policies that allow greater control of the deficit of the balance of payments, namely the deflationary policies. In contrast, on reaching Δt_2, forces of a social nature occur, which prevent G_A from reaching the target set so that, in Δt_2, a_2 the following structure may present itself

$$[5] \qquad a_{2,2} = (0{,}6\, x_1,\ 0{,}4\, x_2)$$

In this case, the economic policies pursued by G_A failed to change the structure of the distribution of income and to act on average labour productivity jointly with the average level of wages. This is a phenomenon that may be, at least in the abstract, assimilated to that of addiction, in respect of which a subject contradicts with their actual behaviour in a given period, the commitments undertaken with self, in a previous period.
The addiction therefore is explained as a contradiction between plans devised and effective behaviour. In the same way that some cases, and more precisely in those that have to deal with an *imperfectly anticipated inflation*, indicate a certain incapacity of one or more of the governments to control inflation, under the pressure of a number of forces of a social order. In fact the causes of an inflationary process can be manifold; however, this work is focused on the type of inflation which is determined by the choices of economic and monetary policies of governments, in that we are not as interested in the inflation processes themselves, as in

those that are not fully controllable by the governments and which, for that reason, bring into question the effectiveness of the commitments made in favour of stability.
Well, from an institutional viewpoint we can assume that the persistent deficit in balance of trade and payments of country *A* in respect of country *B* is due to a negative difference in productivity not corrected by an appropriate negative gap in wage levels. These differences in productivity may occur especially if in country *A* significant segments of the labour market exist that are protected by foreign competition, where the monetary wages are established irrespective of the levels of productivity of those sectors, according to an approach that to some extent is inspired by the Scandinavian inflation theory. Situations of this kind can also be created by virtue of the existence of collective bargaining rules that do not respect a more urgent principle of labour efficiency and the allocation of financial resources. The habits in labour market management are certainly not affected by the determination of the differentials in labour productivity between two or more national economies.

Conclusions

The objective of this work is to offer an interpretative model of the change of international economic institutions using the experience of the EMS by way of verification. The breaking of rules based on a system of fixed exchange rates, but oscillating within a determined range of fluctuations, leads some governments to surrender to inflationary influences. This happens for reasons that are exogenous to economic logic, that is, for social and political reasons. However, when it happens, the effects are economic in nature and result in a drive to exit from the rules established. In this analysis we refer to cognitive science concepts and methods mainly because it is considered that the creation of expectations and regret belong to the sphere of these disciplines, although they may be introduced in strictly economic schemes from a methodological point of view.

References

Aoki,M. (2001), *Toward a Comparative Institutional Analysis*, Cambridge, MA: The MIT Press

Arrow, K.J.(1951), *Social Choice and Individual Values*, New York: Wiley

Bernanke, B.S., Laubach,T.,Mishkin, F.S. and Posen, A.S. (1999), *Inflation Targeting*, Princeton, NJ: Princeton University Press

Bicchieri,C.(1997), "Learning to cooperate", in C.Bicchieri, R.Jeffrey and B.Skyrms (eds), *The Dynamics of Norms*, Cambridge, UK: Cambridge University Press, pp. 17-45

Buchanan, J. and Tullock,G.(1962), *The Calculus of Consent. Logical Foundations of Constitutional Democracy*, Ann Arbor:The University of Michigan Press

Camerer, C.F.(1981), « General Conditions for the Success of Bootstrapping models », *Organizational Behavior and Human Performance*, 27:.411-22

Dehem,R. (1972), "Le mirage monétaire européen: son cout et ses aléas", *Recherches Economiques de Louvain* : 201-15

Engel,C. and Weber,E.U. (2007), "The impact of institutions on the decision of how to decide", *Journal of Institutional Economics*, (3),n.2:323-49

Elster, J.(1992), "Intertemporal Choice and political Thought", in G.Loewenstein and J.Elster (eds), *Choice over Time*, New York: Russel Sage Foundation, pp.35-53

Eply,N.(2007), "A Tale of Tuned Decks? Anchoring as Accessibility and Anchoring as Adjustment", in D.J.Koeler and N.Harvey (eds), *Blackwell Handbook of Judgement & Decision Making*, Malden,MA: Blackwell, pp.240-57

Frederick, S. And Loewestein, G.F.(1999), "Hedonic Adaptation", in D.Kahneman, E.Dieter, and N.Schwartz (eds), *Well-being: The Foundations of Hedonic Psychology*, New York: Russel Sage Foundation, pp.302-29

Friedman, M.(1959), "Statement in Monetary Theory and policy", *Joint Economic Committee Hearings, Employment, Growth and Price Levels*, Washington,US Government Printing Office, pp.605-12

Friedman,M.(1970), "The Counter-Revolution in Monetary Theory", *Occasional papers*,n.33, London,IEA,

pp.22-32
Frisch, H. (1983), *Theoris of Inflation*, Cambridge,UK: Cambridge University Press
Furobotn, E.G. and Richter,R.(2000), *Institutions and Economic Theory. The Contribution of the New Institutional Economics*, Ann Arbor: The University of Michigan Press
Giavazzi, F. and Pagano, M. (1988), "The Advantage of Tying One's Hands. EMD Discipline and Central Bank Credibility", *European Economic Review*,(32): 1055-82
Gigerenzer, G.(2007), "Fast and Frugal Heuristics: The Tools of Bounded Rationality", in S.J.Koeler and N.Harvey (eds), *Blackwell Handbook of Judgement & Decision Making*, Malden,MA: Blackwell, pp.62-88
Goodwin,P and Wright,G. (2004), *Decision Analysis for Managemen Judgement*, New York: Wiley
Grandomont, J.M.(1988), "Temporary General Equilibrium Theory", in K.Arrow and M.Intriligator (eds), *Handbook of Mathematical Economics*, vol.2, Amsterdam: North Holland, pp.879-922
Harrod,R.F.(1972), " The Issues: Five Views", in R. Hinshaw (ed), *Inflation a a Global Problem*, London: John Hopkins Press, pp.32-57
Hicks, J.R.(1939), *Value and capital*, Oxford, UK: Clarendon Press
Hilton, D.J. (2003), "Psychology and Financial Markets. Applications to Undestanding and Remedying Irrational Decision-Making", in I.Brocas and J.D.Carrillo (eds), *The Psychology of Economic Decisions*, Vol.I, New York : Oxford University Press, pp.273-297
Hodgson,G.(1988), *Economics and Institutions: A Manifesto for a Modern Institutional Economics*, Oxford, UK: Basil Blackwell
Hsee,H.,.Zhang,J.,and Chen, J.(2007), "Internal and Substantive Inconsistence in Decision Making", in D.J.Koeler and N.Harvey (eds), *Blackwell Handbook of Judgement & Decision Making*, Malden,MA: Blackwell, pp.360-78
Issing, O and Tristani, O.(2005), "Monetary Policy in Unchartered Territory", in O.Issing, V.Gaspar, O. Tristani and D.Vestin (eds), *Imperfect Knowledge and Monetary Policy*, Cambridge, UK: Cambridge University Press, pp. 12-73
Kahneman, D.(1994), "New Challenges to the Rationality Assumption", *Journal of Institutional and Theoretical Economics:* 18-36
Kahneman, D.(2000), "Experienced Utility and Objective happiness: A Moment-based Approach", in D.Kahneman and A.Tversky (eds), *Choices, Values and Frames*, Cambridge,UK: Cambridge University Press, pp.673-92
Kierzkorwsky, H.(1976), "Theoretical Foundations of the Scandinavian Model of Inflation", *The Manchester School of Economics and Social Studies Review:*.232-44
Klochko, M.A. and Ordershook, P.C.(2005), *Endogenous Time Preferences in Social Networks*, Cheltenham, UK: Elgar
Kreps, D.M.(1990), *Game Theory and Economic Modelling*, Oxford, UK: Oxford University Press
Krugman,P. (1995), *Pedding Prosperity: Nonsense in an Age of Diminished Expectations*, New York: Norton & Co.
Laidler,D. and Parkin,M.(1975),"Inflation: A Survey", *Economic Journal*, (85): 741-809
Lindhal, E. (1929), "The Place of capital in the Theory of Prices", reprinted in *Studies in the Theory of Money and Capital*, New York: Rienhart, pp.269-350
Loomes,G. and Sugden,R. (1982), "Regret Theory. An Alternative Theory of Rational Choice Under Uncertainty", *The Economic Journal* (92): 805-24
Meade,J.E. (1952), "The Balance of Payments Problems of a Free Trade Area", *The Economic Journal* (62): 379-96
Mistri,M. (2003),"Addiction and Economic Rationality: A Theoretical Contraddiction?", *Studi Economici* (81), n.3: 5-18
Mistri, M.(2007), "Institutional Changes and Shifting Ideas: A Constitutional Analysis of the Euro", *Consitutional Political Economy*, vol.18,n.2: 107-126
Mundell, R.A.(1961), "A Theory of Optimun Currency Area", *The American Economic Review* (51): 657-64
Muth,J.(1961), "Rational Expectations and the Theory of Price Movements", *Econometrica*: 315-35
Von Neumann, J. and Morgenstern,O. (1944), *Theory of Games and Economic Behavior*, Princeton, NJ: Princeton University Press
Phelps, E.S.(1983), "The Trouble with Rational expectations and the Problem of Inflation Stabilization", in R.Frydman and E.S.Phelps (eds), *Individual Forecasting and Aggregate Outcomes."Rational*

Expectations" Examined, Cambridge, UK: Cambridge University Press, pp.31-41
Rachlinski, J.J. (2007), "Heuristics, Biases, and Governance", in D.J.Koehler and N.Harvey (eds), *Blackwell Handbook of Judgement & Decision Making,* Malden,MA: Blackwell,pp.567-84
Russo, J. And Schoemaker, P.J.(1991), *Confidential Decision-Making: How to Make the Right Decision Every Time,* London: Platkus
Siklos, P.L. (ed)(2005), *The Economics of deflation,* Cheltenham, UK: Elgar
Simon,H. (1972), "Theories of Bounded Rationality", in C.B.Radner and R.Radner (eds), *Decision and Organization,* Amsterdam:North Holland, pp.161-76
Sargent, T.J.(1993), *Bounded Rationality in Macroeconomics,* New York: Oxford University Press
Strotz, R.H.(1956), "Myopia and Inconsistency in Dynamic Utility Maximization", *Review of Economic Studies,* (23): 166-80
Walliser, B.(2008), *Cognitive Economics,* Berlin: Springer
Wilson, T.D., and Gilbert, D. (2003), "Affective Forecasting",*Advances in Experrimental Social Psychology,* 35, pp.345-411
Winston,G.C. and Woodbury,R.G.(1991), "Myopic Discounting:Empirical Evidence", in E.Frantz et all (eds), *Handbook of Behavioral Economics,* vol.2B, London: JAI Press, pp. 325-42
Zaleskiewics,T.(2006), "Behavioral Finance", in M.Altman (ed), *Handbook of Contemporary Behavioral Economics,* New York: Sharpe, pp.706-728

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