

The Economist Confronted by Epochal Innovations: The Relationships between History and Theory

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*Robert Boyer**

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* Directeur de recherche au CNRS, Directeur d’études à l’EHESS, CEPREMAP-ENS, 48, Boulevard Jourdan, 75014 Paris, France. Tel.: (33) (0)1.43.13.62.56 ; Fax: (33) (0)1 43.13.62.59 ; E-mail: robert.boyer@cepremap.cnr.fr

Abstract: Citizens and policy makers look to economists' expertise, particularly when paradoxical evolutions take place and the best-informed expectations turn out to be erroneous. The problem is that economic theory has prospered by adopting a methodological standpoint based on the assumption that economic regularities and mechanisms are static. This article deals with the search for relevant tools in order to analyze epochal economic problems. Could previous methods and concepts be retooled or should new ones be sought? How should we use the lessons of economic history? Three contemporary challenges are used in order to test the relevance of alternative strategies: the restructuring of Russia after 1990, the launching of the euro, and the "New Economy."

INTRODUCTION: A PARADOX AT THE HEART OF ECONOMICS

When economies are prospering, economic growth is strong and stable, and full employment is assured, the respect accorded to economists sometimes grows while the role they play in the economy diminishes. At such times, their role is simply to make the sources of this prosperity comprehensible. Several theories to explain prosperity may coexist, but in general a particular body of theory tends to prevail. For example, Keynesianism provided the prevailing economic theory for the thirty glorious years of post-war growth. In such a climate, there are few major problems that demand the economist's expertise.

That level landscape changes completely as soon as we encounter unexpected disequilibria that intensify over time, multiply, and reinforce one another. In response to the appearance of stagflation, large variations in exchange rates, the rise and persistence of European unemployment, or repeated financial crises, the prevailing interpretive system(s) cannot hold, and the economist is forced to reassess his theoretical framework in order to provide a better, more applicable explanation for these events. Given that policy-makers and sometimes the general public turn to economists for answers on how to assess reforms and resolve these problems, this ability to reinterpret and revise theoretical frameworks is crucial. In the process, a dilemma arises, for the economist, if he is honest, must admit that he cannot respond to these queries with certainty if he has not created the proper tools, and creating those tools is difficult if he lacks both an analytical distance from the confusion of events and certainty about their precise character.

This dilemma, however, is no accident because it lies at the very heart of the economist's discipline. It deserves to be revisited in the context of the major economic transformations that have come to pass since the 1980s and in light of the evolution of economic theory that has accompanied these transformations.

The Scientific Method Presupposes the Repetition and the Reproduction of Phenomena...

If economics took the scientific method used development of the physical sciences as its reference point, it should set itself the tasks of defining basic concepts, deriving measurable quantities, developing hypotheses relating to the relationships among phenomena, and systematically verifying the fit between a theory's predictions and observable data. Each anomaly should then result in a process of adjustment to the theory, and if that anomaly proves to be major, in the search for a new paradigm. This scientific methodology combines three major characteristics. First, it involves deriving from theory consequences related to observable variables. Second, it entails a process of testing predictions, with the understanding that the laws set forth are *atemporal*, that is, they can be the object of repeated experiments over time and across space. Finally, it involves updating the theoretical framework in such a way that an increasing number of phenomena can be taken into account within a context of a small group of axioms and postulates. Over time, this process of theoretical revision has demonstrated its generalizability and analytical power.

This model, moreover, has driven/fueled/has been used in the development of modern economic theory, which has adopted the requirement of elaborating seminal general concepts in the discipline, in particular those that explain the formation of prices and incomes, which together constitute what has become known as the "theory of value." The notion of an equilibrium should have as its aim ensuring the reproducibility of experience, even if it is only conceptual. The notion of rationality, on the other hand, aims to define a general principle of human behavior in the economic sphere and more generally in the context of social interactions. In theory, it is the task of econometrics to verify the existence, stability, and generalizability of the relationships and results set forth by the theoretical economist. Both econometrics and theoretical economics, however, presuppose a stationary world, or at the very least, one in which certain regularities can

be applied over time and space to describe relationships. In this way, the economist is perceived as a faithful disciple of the natural sciences.

But Big Economic Questions Often Derive from Unprecedented Phenomena

This ideal within the discipline of economics remains elusive despite two centuries of progress in the conceptual precision, the coherence offered by generalizable models, and the sophistication of econometric techniques. Indeed, in tandem with its increasing internal coherence, economics has developed significantly in response to observations of major discrepancies between the predictions derived from particular theories and apparently paradoxical developments in a wide variety of domains, particularly during severe economic crises.

John Maynard Keynes's macroeconomic concepts emerged from the following observations: first, so-called "classical" theory could not explain the persistence of an equilibrium of under-employment, and second, the functioning of financial markets is often disturbed by speculative bubbles which, to say the least, do not enjoy the stabilizing function ascribed to them by conventional theories' emphasis on an equilibrium's deriving from a "fundamental value." In this context, one can read his *General Theory* in two distinct ways. Without a doubt, Keynes attempted to demonstrate that, contrary to general interpretation, classical theory is not generalizable and even incoherent. At its base, his critique also dealt with the incapability of existing theories to account for significant transformations within financial and labor markets, historical transformations which themselves call into question the relevance of classical conceptions and negate their validity. In Keynes's view, his theory did not represent a correction to the errors of classical theory as much as it represented a response by the economist to the destabilization of classical theory by a series of unprecedented structural transformations.

One could develop the same interpretation with regard to the decline of Keynesian theory after the 1970s. For many observers, this decline derived from the logical failures of Keynes's framework, while for others, it was precisely the transformations resulting from the Keynesian revolution that gave rise to unprecedented events: attenuation of business cycles accompanied by inflation even during recessions, the series of stagflationary crises following the oil shocks, tensions within national and international financial systems. Within this context of disequilibria, a series of hypotheses and alternative theories emerged: the renovation of monetarist theory, supply-side economics, the theory of rational expectations, the concept of NAIRU, models of real business cycles, theories relating to asymmetrical information, endogenous growth theory, new conceptions of international trade, etc.

This dependence, whether explicit or implicit, of economic theory on the central economic questions of each era has long been characteristic of the development of economists' work. But the deepening division of labor within the community of economists introduced yet another tendency, namely the closing in of the economics field on itself (in other words, the self-referential explanation of economics). A rapid historical retrospective on this matter is enlightening and worthwhile.

A Dilemma that Traverses the History of Economic Theory

In the beginning, the emergence of a trading and then an industrial economy gave rise to the ideas of classical economics. Did not the quantitative theory of money emerge precisely from the problems created by the arrival of large quantities of gold from Latin America in Spain and the rest of Europe? Did not the French physiocrats respond precisely to the crown's search for the best way to raise taxes in a society dominated by agricultural production and agrarianism? Did not David Ricardo study the consequences of the rise of manufacturing on revenue distribution? Did Ricardo not posit decisive arguments in favor of free trade that are still used

today? In short, the origins of the preoccupations of classical political economy lie in problems suggested by contemporary developments in the world.

Subsequently, the prevailing interpretive system of classical economics that emerged from the responses to these problems split into two branches or, more precisely, into two research agendas that tended to drift apart over time.

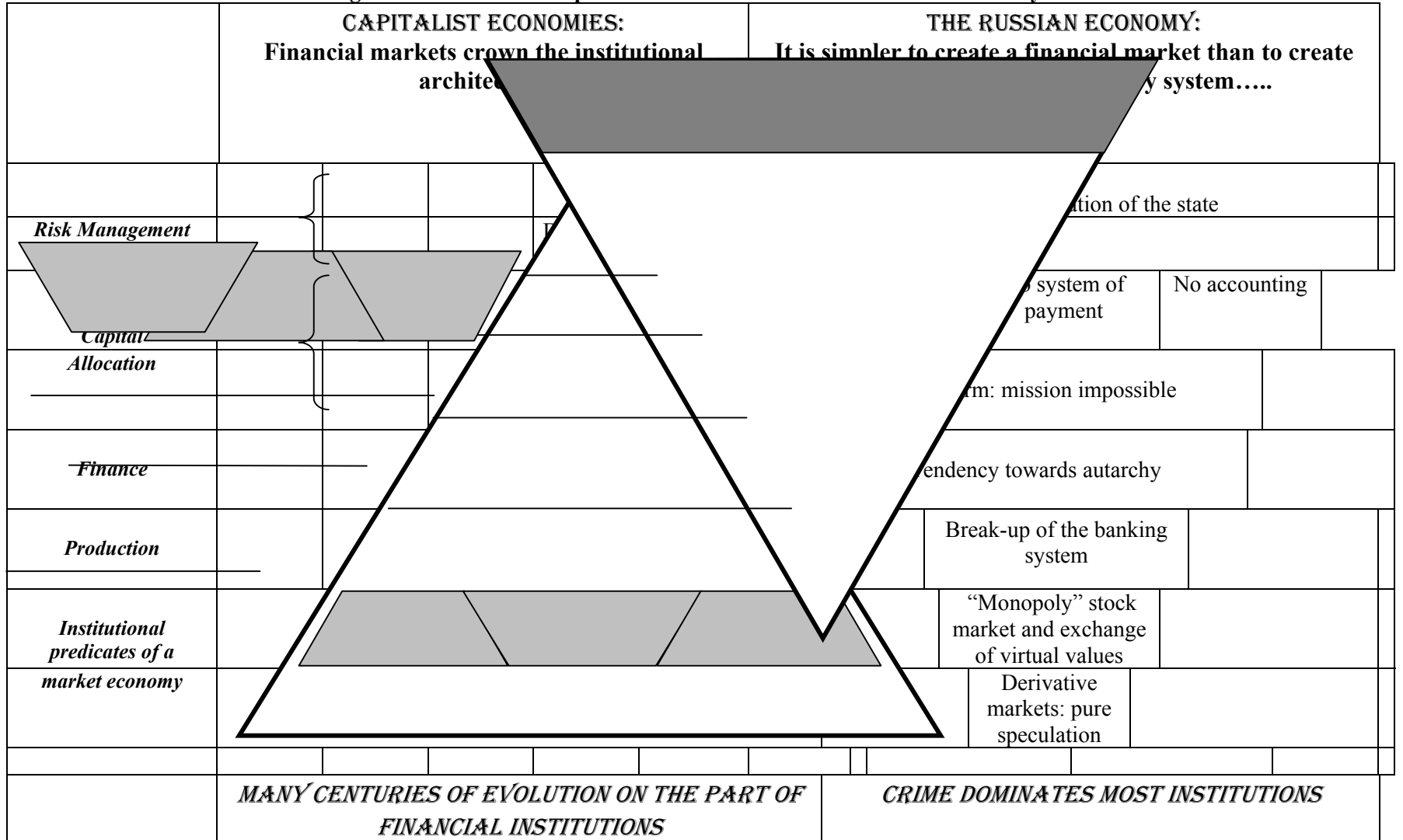
Historicists Emphasized the Idea that Capitalism Induces Endogenous Changes for Which Theory Should Be Able to Account

Each in his own way, Malthus, Smith, Marx, Schumpeter, and Keynes responded to the questions that derived first, from the great demographic transition that gave rise to both manufacturing and the market, second, from the recurrence and worsening of major industrial and financial crises, and third, from the role of entrepreneurs and innovators in the alternation between periods of prosperity and stagnation. In this way, they situated themselves firmly within the classical tradition, which made relevance the essential criterion of value for any theory. In doing so, however, these economists reached conclusions that appeared to be contingent and which shaped policy debates and became part of the strategic options available to governments. By insisting upon the historically determined character of economic regularities and the powerful linkage between the economic and the political, they seemed to qualify the reach of scientific inquiry in their own analyses. But is it not the case that circumscribing the range of validity of an analysis also part and parcel of scientific inquiry?

Logicians Became Devoted to Analyses of Reproduction, Equilibrium, and Stationary States

But this same development enriched notions of historical development and the concepts that allow one to think about it productively. It gave rise to an internal development within the economics discipline that was based upon logical analysis of the relationships among diverse concepts, their links to quantitative measurement, and their connections with more qualitative phenomena. Not surprisingly, a research agenda enamored of logic and aimed at providing axiomatic foundations for the discipline referred to as “Pure Economics” emerged. This clan of logicians, who opposed the theories of those economists who advocated the historically contingent character of economic analysis, included Walras, Pareto, Pigou, and Marshall. Their development of “pure” economics culminated in the theory of general equilibrium, the Greek temple of the discipline marked by the rigor of its construction and its æsthetic appeal. Contemporary neoclassical theory has extended and adapted this tradition and refined its foundations by centering on three canonical hypotheses: the rationality of human behavior, market equilibria, and rational expectations, as well as the related requirement that relationships be treated as static. These hypotheses have the advantage of defining a coherent whole, conducive to modeling that is appropriate to the study of an economy subjected to stochastic, or random, shocks (Figure 1). Reversibility in the vicinity of an equilibrium and the presumption of the intrinsic ineffectiveness of government policy are often associated with this kind of analysis.

Figure 1: Institutional Sophistication Cannot Be Created Instantaneously



There is no doubt that progressive axiomatization, mathematization, and formalization have lent unprecedented rigor to economists' work. This change sometimes wins them the recognition of their colleagues in the natural sciences, for both use the same methods and tools. The essential question, however, is perhaps slightly different: does this theoretical current, in its proliferation, really shed adequate light on the great problems encountered by economists of North and South, the rich and the poor alike?

Contemporary Change in Search of Theories

Apparently, not at all! And this is no accident. Methodological individualism conquered the terrain of the social sciences at the same time that unprecedented structural problems were being encountered. The ideas of static economic variables and the stability of economic laws have been seriously called into question by developments since the beginning of the 1970s. Disequilibria in both the labor market and international relations have arisen and persisted, refuting the hypothesis of re-equilibration by spontaneous market adjustment. The hypothesis of rational expectations has introduced yet another paradox, which has colored many contemporary research efforts: all economic agents recognize the deterministic aspects of a true model of the economy...except for the economists themselves, who, at least for the time being, have reached no consensus on questions such as the slowing of economic growth that emerged between the two oil shocks and the vibrant growth of the United States during the 1990s.

Is this not at the heart of the paradox? At a time which Karl Polanyi would easily characterize as a "great transformation," theoreticians, econometricians, and political economists have constructed a research agenda that neglects, if not excludes, the possibility of such structural changes, or at least makes them very difficult to understand. Major endogenous shocks, which in fact represent significant changes, are dismissed as minor and exogenous. As a first example, let us take the fact that, even 25 years later, there is no agreed interpretation of the slowing growth of factor productivity in nearly all developed countries. One should recall that this was the point of departure for the Regulation School, which was conceived as a critical update of Kaleckian and Marxist theories in light of their inability to account for either the regular and dynamic nature of growth until the early 1970s *or* its dramatic slow-down and unevenness thereafter.

A Research Agenda

Developments during the last two decades have raised still other questions. How are we to explain the fact that the "transition" of the Russian economy has been so difficult? Do we have theories at our disposal that can account for the effects and the viability of the euro? Does the concept of the "New Economy" designate the emergence of a stable growth régime that can spread from the United States to most other countries? This article aims to explore these three themes with the intent of drawing a few conclusions about the future of economic research. Each theme illustrates the inadequacy of the founding hypotheses of economics in the majority of contemporary scholarly work (Table 1).

Table 1: Economic Theory Confronted by Two Situations

	RECURRING EVENTS	RADICAL INNOVATIONS
<i>Hypotheses</i>	<ol style="list-style-type: none"> 1. <i>Substantive</i> rationality 2. The <i>market</i> as unique form of coordination 3. Rationality of <i>conceptions</i> 	<ol style="list-style-type: none"> 1. <i>Procedural/contextual</i> rationality 2. Organization, association, community, networks, state : other forms of coordination and trajectories of deliberation 3. <i>Belief</i> in a “new era”
<i>Characteristics</i>	<ol style="list-style-type: none"> 1. All agents end up knowing the “true model” of the economy 2. <i>Reversibility</i> in the vicinity of an equilibrium 3. <i>Intrinsic</i> ineffectiveness of public action 	<ol style="list-style-type: none"> 1. <i>Radical uncertainty</i> about the final configuration of the economy 2. Presumption of <i>path-dependence</i> 3. Window of opportunity for <i>certain</i> collective interventions

The hypothesis of “substantive rationality” exceeds the real cognitive capabilities of most actors and should be replaced by an hypothesis that can illustrate the procedural and contextual aspects of rationality. The market is far from the sole form of coordination of a series of decentralized actions, although its reach has grown as a result of privatization, deregulation, and the success of the firm. The three examples under review here show the importance of deliberation, representation, and politics and policy, and therefore of the role of organizations, associations, networks, and, paradoxically, the state. Their objectives and means are not invariant in the long run, and their structure and hierarchies change over time and thereby define modes of coordination that are theoretically and empirically different. Finally, the centrality of rationality in conceptions of the workings of the economy represents a useful constraint in the development of models, but it also violates, among other things, the most elementary observations of the functioning of financial markets and the spread of the *belief* in a “new era.” Confronted by the emergence of an unprecedented economic reconfiguration in a transformation that is at once technological, financial, and social, even the best-informed actors tend to reject the lessons drawn from earlier periods.

The joining of these three hypotheses allows the observer to understand several of the characteristic traits of contemporary economies. First, these hypotheses or concepts imply path-dependence more than they do a complete reversibility in the vicinity of an equilibrium that is presented as shared by the vast majority of countries. Second, it is important not to ascribe to economic agents a breadth of knowledge that even professional economists do not necessarily have, in order to remind oneself that a certain degree of uncertainty always prevails within the mechanisms governing a particular society and economy. Finally, despite repeated assertions of certain erroneous political-economic concepts, it is improper to assume that public authorities always and everywhere have a negative impact on economic efficiency and social justice. Indeed, there are several historical episodes during which it has been the state’s *inability* to act that has given rise to situations of crisis and profound uncertainty.

We can examine this general interpretation in the context of the first of our case studies, namely, developments in Russia after the collapse of the Soviet Union.

THE GREAT RUSSIAN TRANSFORMATION: KALEIDOSCOPIC APPROACHES TO SYSTEMIC CHANGE

It was expected that the elimination of central planning and the disappearance of the Communist Party in the Soviet Union would allow for a relatively rapid and easy passage to a market economy and a democratic political system. The ultimate end point seemed well known, since it had come to pass in several Western countries, and the previous régime was unpopular enough to elicit broad support for a political and economic program to effect expansion of individual freedom and a rapid improvement in the standard of living. The enlightened councils of the international community of economists agreed that the market and democracy were supposed to emerge without difficulty after the disappearance of Soviet institutions. Ten years later, it has become clear for many observers not only that the mafia supplanted the market as the mechanism of economic coordination, but also that the Schumpeterian entrepreneur's suffocation by the opportunism of speculators, rentiers' winning out over industrialists, and finally the monopolization rather than the creation of wealth, were all the direct consequences of the collapse of Russia's legal and institutional frameworks (Touffut, 1999). Both the market and democracy are the products of an evolution stretching over many centuries; as a result, it was impossible to create legitimate and effective democratic and capitalist institutions in the space of a few years. It is therefore not surprising that the other COMECON countries, which had to bear the Soviet régime only after the Second World War, in general fared better in this "great transformation." The term "great transformation" is more appropriate than "transition," since it leaves open the question of the ultimate outcome and does not assume that it will be a mere copy of Western economies.

Models of a Calculable General Equilibrium, or the Idea that the Russian Economy Would Be Prosperous If Only It Had the Same Properties as Its American Counterpart!

For the disciples of an economic theory capable of offering general lessons that go beyond a particular place and time, the disappointments attendant to the transformation of the Soviet economy could only be the result of the violation of such a model's lessons. On the one hand, the Keynesian school continues to advocate an extension of the IS-LM model and to assert the existence of an economic policy error, namely too much looseness in monetary policy in response to public deficits resulting from poor management of the national budget. On the other hand, those who subscribe to the idea that the macroeconomy is reducible to microeconomic foundations call for an analysis of the reactions of firms and individuals to various shocks, real and monetary, that affect the formation of equilibrium prices, like a Walrasian model extended across time. In both cases, though, the functioning of good economic policy, in particular the reduction of public deficits and the introduction of market-based price-setting mechanisms, are seen as capable of resolving the various disequilibria present in the Russian economy. The general hypothesis, at least implicitly, is that the mechanisms at work in Western economies, long ruled by a market logic, and those at work in "transition" economies are similar if not identical.

This hypothesis of invariance, which lies at the heart of modern economic theory, tends to employ a particular kind of description of economic behavior for reasons of both simplicity and parsimony. First, it presumes that economic agents are numerous and do not suffer from asymmetry in terms of technology, information, and power. Second, it presumes that because preferences are only revealed indirectly, analysis must content itself with extremely general properties that are supposed to represent them. In addition, it presumes that economic agents use the same conception of economic mechanisms that the economist uses in his own formulations, in particular, in the model of general equilibrium. And fourth, it supposes that the market is the sole

form of coordination among economic agents, whose behavior is expressed only through the formulation of the interaction of supply and demand, which are presumed to be interdependent.

Using this analytical framework, one could suppose that the Russian economy would very quickly undergo a development exactly comparable to that of Western economies with a very few exceptions, such as the former's greater specialization in natural resources. As a result, it seemed of very little importance how reforms of prices, exchange rates, and privatization were sequenced, since economists hypothesized—quite optimistically in terms of the lessons of the theory of general equilibrium—that the economy would converge on a single equilibrium. But the experiences of the 1990s did not bear out these predictions, and in response foreign economists who were asked to clarify the choices available to Russian authorities advanced two kinds of interpretations. The first was that reforms had not been prosecuted vigorously enough, and so the economy had actually remained close to the former, “Soviet” equilibrium; this argument gave rise to a debate between advocates of “shock therapy” and those who favored a more gradual transition (Aslund, 1995; Sapir, 1998). The second theorized that the Russian population's preferences differed considerably from those of Western countries, and so the introduction of a market logic resulted in the resistance of the oldest members of the population, among other groups (Buchanan, 1997). In either case, a lucid analysis of the advantages of the market should be able to overcome the rather irrational, even “ideological” obstacles undermining both the actions of political authorities and the day-to-day behavior of consumers, workers, and entrepreneurs.

The Necessary and Sufficient Institutions for a Viable Market Economy: Ground That Still Needs to Be Broken

For many economists who are accustomed to working with economies that have enjoyed a long process of market maturation, the power of commercial logic seems obvious. Thus, at the beginning of the 1990s, the dissolution of the Soviet régime was supposed to create, on its own, the conditions necessary for the emergence and diffusion of mechanisms of competition across the markets for goods, finance, and labor. On the one hand, economists held that privatization would lead to the provision of supply from independent economic agents, and on the other that the disappearance of coordinating institutions such as Gosplan would result in sharpened competition and thereby stimulate innovation, growth, and increased standards of living. In a way, this analysis supposed not only that markets enjoyed the capacity for self-regulation, but also that institutions would create themselves. However, events demonstrated that even economies dominated by a market logic require examples of so-called regulation in order to ensure that competition does not result in cartels or monopolies (Fligstein, 1996). Moreover, economic history shows that the emergence of open and public markets in which supply and demand can interact depends on the existence of a public authority capable of defining rules of operation and ensuring the enforcement of these rules, through a disciplining power exercised either directly by a ministerial department or by a professional association (Braudel, 1979).

Table 2: The Market Viewed by Economists and Sociologists

THE ECONOMIC CONCEPTION OF MARKETS		THE SOCIOLOGICAL AND HISTORICAL APPROACH TO MARKETS
A <i>mechanism</i> delivers a unique price for the same good as a result of the interaction of supply and demand	↔	An <i>institution</i> that reproduces the strategy and governing concept of actors who are already present
A “ <i>black hole</i> ,” an empty set	↔	The site of <i>social, political, and economic interactions</i>
Constrained behaviors by <i>equal</i> individuals who see the economic environment as given	↔	<i>Strategic</i> interactions among <i>heterogeneous</i> social actors who seek to stabilize or transform their environment
Pure and perfect competition is the ideal to be pursued		“ <i>Imperfect competition</i> ” is the rule
An <i>exclusively economic</i> mechanism, self-regulating and subject to spontaneous institutionalization	↔	An <i>institutional construction</i> that emerges from social movements
A <i>universal</i> mechanism	↔	Only <i>extremely precise conditions</i> in the areas of law, jurisprudence, accounting, and the monetary régime...permit the emergence of the market
The equivalent of the <i>state of nature</i>		A <i>very sophisticated social construction</i>
By nature <i>structurally stable</i>	↔	The typical evolution of the market: <i>emergence, development, obsolescence, crisis</i> and disappearance

Recent Russian experience confirms the lessons of sociology and economic history shown in Table 2. The definition of property rights, so essential to the emergence of a commercial logic, presupposes the existence, not only of a legislative apparatus, but also of courts able to enforce the laws that this apparatus creates. In short, it presupposes the existence of a state that is able to exercise the functions of legitimization and legal coercion, functions that were made difficult by the discrediting of the Soviet state. In this way, despite what some might argue, the state can act as the creator of the market rather than as its alternative. Likewise, the market plays the role of spreading purchases and sales over time, thanks to the existence of credit. If, on the other hand, as was the case throughout the 1990s, the system of payment is completely disorganized, the rise of barter and non-monetary private credit create severe limits on the extension of the market mechanism.

The institutionalization of the “labor market” is even more essential when one intends to restructure the system of production in response to changes in internal demand and the imposition of constraints on competitiveness. Workers’ mobility from firm to firm was traditionally limited by the Soviet régime, if only because firms themselves assured social protection as well as access to certain essential goods and certain competencies were firm-specific (Najman, 2000). In the absence of institutions able to organize the external mobility of Russian workers, it is difficult to think of their benefiting from the advantages of the market in terms of either static or dynamic efficiency. Finally, the contraction of state revenues and the resulting drastic reductions in expenditures on education, health, and research demonstrated to an absurd extent that the collective organization of certain services can contribute to the productivity and viability of an economy: clearly, a minimal state is not necessarily an optimal one.

The great Russian transformation has thus shown that modern economic theory does not offer a satisfactory analysis of the necessary or sufficient conditions for the development of a market economy. On the other hand, some sociological and economic historical work is already starting to set forth hypotheses that might be useful for the work of the theoretical economist. This represents an invitation to develop a new group of alternative concepts relating to the factors that create coherence in an economic system, the relationships among various scales of time, and finally the relationship between politics and economics.

Partial Analyses of a Systematic Transformation

The last half-century has witnessed a considerable deepening of the division of labor in society as a whole, as well as within the social sciences in general and in particular within the discipline of economics. In one sense, the tendency illustrates the maturation of the scientific process. Economic analysis has split into a series of sub-disciplines dealing with the analysis of production, the origins of technological change, finance, money, labor, the management of social services, taxation and social protection, international trade, international relations, and many other specialties. In an economy characterized by a more-or-less stable growth régime, this growing independence of research fields is not a threat to our understanding of the whole. In economies in which inherited institutions have been destroyed, eroded, or reconstructed, however, there are many levels of interdependence between reforms undertaken in one area and consequences for the rest of the economy. For example, a monetary reform affects the plight of firms, their capacity for creating jobs, and their ability to innovate, in contrast to the postulate of the long-run neutrality of money imposed by theoreticians working from a model of a stable régime of growth.

Russia provided an exemplary case of the strength of this interdependence. A series of partial reforms, far from supporting one another, contributed to the destabilization of the previous economic régime without the emergence of an alternative one. In this context, specialization by sub-discipline proved damaging to our understanding of the change brought about by reform. The corollary of this observation is that contemporary economic theory no longer has as its object the fundamental entity referred to as “capitalism” (Boyer, 1999a). This fact has increased the difficulty of applying the lessons of this body of theory to the case of the transformation of the Russian economy (Sapir, 1998). However, research dealing with comparative institutional analysis (Aoki, 2001), institutional complementarity (Amable *et al.*, 2000), or even hierarchies within a set of institutions (Boyer, 1999b), is capable of shedding light on the evolution of certain configurations previously under a Soviet-type régime.

Variation among the Polish, Hungarian, Czech, Romanian, and Russian trajectories illustrates the diversity of configurations that resulted from the collapse of the Soviet Union (Chavance *et al.*, 1999). This variation offers an additional piece of evidence in favor of the central hypothesis offered by contemporary institutional research: although until the 1980s one author could imagine that the selection of institutions was determined by the criterion of economic efficiency (North 1966; 1981), the same author was to admit in the 1990s that institutions themselves define the role of economic agents, as well as the system of incentives and constraints to which they are subject. This essential role, moreover, functions largely independently of the criterion of efficiency (North, 1990). An institutional framework that delivers mediocre macroeconomic performance can endure over a long period of time even if many examples of superior institutional configurations are available. Certain transformations show that, taking externalities into account, interactions of actors around an existing equilibrium can block evolution toward an equilibrium that is Pareto-superior (Boyer and Orléan, 1992). Economic history confirms that this apparent paradox has already emerged in Great Britain and in Argentina, as well as in contemporary Russia.

The Transformation of Institutions, Coordination, and Behavior in the Long Run

The economist, unless he is a specialist in the matters of growth and economic history, is unconcerned with the long run. In addition, the increasing strength of debenture and then stock markets has led to a disproportionate emphasis on finance in the short run, which contributes to the shaping of the decisions of large firms as well as the decisions of most governments. As a result, the heterogeneity of the timeframes relevant to finance, production, investment, technological change, and demography is frequently underestimated. Once again, the transformation of economies formerly subjugated to Soviet-type régimes provides us with several exemplary cases. Under this framework, shouldn't the *Länder* of the former DDR have achieved the levels of productivity and standards of living of their Western German counterparts in less than a decade? Wasn't the transition to a market economy in Russia presented to the public as the way rapidly to catch up to Western standards of living? In both cases, these predictions reflected observers' ignoring the fact that the time required for institutional formation is more or less equal to that needed for the maturation of technological systems, and demographic changes take place over an even longer period of time.

A diagnostic error compounded this unjustified impatience : it would be enough for Russia to import most of its economic and financial institutions from the West in order for there to emerge an institutional configuration of the same, although not perfectly identical, type. However, it proved easier to create a debenture and stock market in Moscow than to codify property rights, to organize and implement accounting principles ensuring market transparency, or to endow authorities with the power to control and oversee the market that had been created. These challenges were made more severe by the fact that, in the absence of a strong and independent judiciary, the most egregious abuses would not meet with any sanctions whatsoever. Ironically, a modern financial market was organized even as the system of credit was breaking up, creating difficulties for the management of firms, the development of the division of labor, and territorial reorganization of economic activity.

These developments tend to invoke the image of a pyramid resting on its apex (Figure 1). In Western economies, the maturation of capitalist institutions stretched out over several centuries, characterized by repeated trial and error, crises, and readjustments: the most sophisticated institutions were built on a foundation of their precursors, most important among which were law, private and public accounting, and a system of credit. From these emerged the charters of large firms, the principle of distinguishing between commercial and merchant banks, and then both large financial groups and the public authorities responsible for controlling them in the name of stock-holders, consumers, and citizens. The financial markets for derivatives that exploded in the United States after the end of the 1980s are only the culmination of this long process of maturation, and their stability owed a great deal to the robustness and resilience of the entire institutional edifice. In Russia, by contrast, the most modern tools of financial management ran up against an incomplete definition of property rights, uncertain principles of firm management, and the absence of a system of credit. It is thus not surprising that the speculator won out over the Schumpeterian entrepreneur, or that insider trading and the improper seizure of resources and capital by a small number of individuals interfered with the transparent and efficient allocation of capital. Nor is it surprising, for that matter, that rival mafias, offering a private form of production, took the place of a state incapable of assuring order and security throughout society.

On a more fundamental theoretical level, the economist is forced to reject the hypothesis of reversibility and to admit, for example, that the sequencing of a set of structural reforms has an important impact on the final outcome (OECD, 1995). The opening of the economy to international financial markets before prices are liberalized and firms are reorganized can result in an dramatically different equilibrium from the one that would emerge if these reforms were carried out in opposite order. Indeed, any structural reform must assume significant fixed costs

before intended benefits can be realized. Path dependence not only characterizes the development of processes of increasing returns (Arthur, 1992) but also the functioning of economic institutions (Boyer, Saillard, 1995). The significance of phenomena of irreversibility goes beyond the great Russian transformation and characterizes most structural changes, such as the euro and the impact of information and communication technology.

The Interweaving of the Political and the Economic

Much of the progress of economic analysis owes a debt to its liberation from a vision of political economy in which the economy was seen as incompletely detached from the political sphere. Such a purge of basic concepts created the desire to circumscribe economics' field of applicability precisely and to explain the formation of prices and incomes with reference to solely economic factors. Without a doubt, technology and demography played a role in this development of ideas to such an extent that they were considered the key determinants of long-run growth while the role of politics was considered negligible or nearly non-existent. There are exceptions to this trend. For example, at the end of the 1970s, macroeconomics rediscovered the idea that political and economic cycles are linked, but in this case this connection dealt with a disturbance relative to an inter-temporal equilibrium that was assumed to be Pareto-superior as long as governments were not opportunistic, seeking to win elections thanks to a manipulation of fiscal policy.

It is much more difficult to eliminate the role of politics when a government's objective is to undertake a series of reforms affecting all of society and, as a result, the economy. The Soviet régime was often characterized as giving politics primacy over the economy, an unrealistic aim that led to failure (Théret, 1999). By contrast, the 1990s have often been interpreted as economics' revenge on politics, a vision that is not baseless with regard to early industrializers, but is inappropriate for the difficulties confronted by the contemporary Russian economy. Indeed, the transition to a market economy, far from being the result of a slow process of maturation and the emergence of a class of entrepreneurs, appeared to be the expression of a political project imposed from above by the Russian government, at the same moment that the collapse of the Soviet régime deprived these entrepreneurs of the means of action that the state had previously enjoyed. Certain analysts spoke of "market Bolshevism" as the successor of a "collectivist Bolshevism" (Sapir, 1998).

One cannot help but imagine a vision that opposes a market-inspired imposition of order to a politically-inspired constructivism, with Keynesianism and, more generally, the social-democratic project as two representative and emblematic examples (Hayek, 1973-1983). A warning against oversimplifying with such a dichotomy is relevant for those responsible for the Russian transition to a market economy. Having adopted a politically inspired vision of economic reform, they ran up against the inadequacies of economic specialization inherited from the past, as well as the social stratification and expectations connected to the collapse of the Soviet order. But even more fundamental to the large margin between objective and result was a major underestimation of the complexity of the linkages between politics and economics. Finally, from the inefficiency and injustice of the Soviet state, the public concluded much too quickly that the state was everywhere and always a predator, and thus that reducing its reach was required in order to permit both the flowering of democracy and the establishment of a market economy. As a counterexample, the path taken by Poland or even Hungary demonstrates how political compromise and the reconstruction of the state can facilitate the acceptance of a market logic even as it increases inequality.

Thus, most of the hypotheses that lend dynamism to contemporary economic research are unable to explain the difficulties associated with the passage from a Soviet-type régime to an economy governed by the pursuit of individual interest (see Table 1 above). But these individual strategies do not result in "easy exchange" in the market in the absence of one peculiar but central

institution: a functioning currency (Aglietta, Orléan, 1998). For currency is the product of the institutionalization by politics of commercial ties by means of collective action, which transcends the strategies of the individual parties to an exchange. Since currency defines the very cohesion of the entire scope of the market, no individual interaction can create a more credible and stable currency to substitute for the Ruble (Boyer, Orléan, 1991). Political action is thus at the heart of the creation of commercial economies. But the difficulty lies in explaining under which conditions the logic of politics—the accumulation of power—can enter into a synergistic relationship with the logic of economics—the accumulation of wealth (Théret, 1992; 1999b). Obviously, during the 1990s Russia did not succeed in reconciling these two logics.

The nature and instability of political compromises in Russia, as well as geopolitical pressures, probably explain this failure, which in turn provides evidence of economists' failure to understand this set of questions.

THE POTENTIAL AND FUTURE OF THE EURO

The launching of the euro has brought to the forefront research on the functions, status, and impact of monetary régimes. The historical approach underlines the multiplicity of events and causes that lead to the decision to create a single currency (Monnet, 1976). At the euro's origin was the political decision to avoid the recurrence of European wars by first organizing the markets for coal and steel, followed by those for agricultural and industrial products, in order to create substantial economic interdependence and solidarity between German and France. The Treaty of Rome extended the number of member states and initiated a slow process of economic integration, thereby creating a slowly developing complementarity between national systems of production. But the collapse of the Bretton Woods system and the introduction of floating exchange rates led to volatility in European monetary relations, which in turn resulted in periodic instability in the larger European market. The result of these events was an effort to coordinate the policies of the major European central banks in order to create some exchange-rate stability, but the financial liberalization of the mid-1980s again exacerbated the sources of monetary instability and thereby threats to the very process of European economic integration. The idea of creating a single European currency, which came into being as early as the beginning of the 1970s, seemed even more urgent after German reunification. The political, economic, and financial spheres were thus tightly interconnected with the creation of the euro.

Diverse Conclusions from Macroeconomic Research Programs...

As a matter of principle, the economic theorist is obliged to isolate certain key mechanisms within this tangle of interdependent factors. The application of the same general principles concerning the rationality of behavior and conceptions, as well as the search for market equilibria, however, leads to conclusions that are not necessarily mutually supportive.

A first approach entails studying the euro with reference to the *reduction of transaction costs* arising from intra-European trade and, more generally, from the uncertainty in exchange rates governing different economies. This idea rests upon the assumption that monetary régimes are created based upon a criterion of efficiency, a premise which the New Institutional Economics leads one to doubt (North, 1990). We must also not forget that the introduction of the euro was essentially a political decision designed to support and relaunch the process of European integration. Moreover, in 2001 the introduction of the euro as the sole means of payment has led to costs, which are far from trivial, associated with the conversion of national credit systems.

It is significant that the European currency has returned the theory of *optimal currency areas*, introduced as early as the 1960s (Mundell, 1961) to the fore. Clearly, given the lack of security in the flexibility of the labor market, the weakness of intra-European immigration, and the existence of incompletely integrated capital markets, Euroland countries are far from

satisfying the criteria set forth by this theory. One can easily see the discrepancies between an approach based upon pure economic rationality and the essentially political objectives of the euro. The approach dealing with real business cycles tends to support the same conclusion: if *asymmetric shocks*, or shocks unique to a single country or sector, are frequent, then the pooling of monetary policy leads to a loss of efficiency in the creation of national economic policies (Erkel-Rousse, Melitz, 1995). This limitation is even more apparent since the Maastricht Stability and Growth Pact limits the autonomy of national fiscal policies that in principle are supposed to deal with such asymmetric shocks, even if we take into account the difficulties arising from the significant effective delay that characterizes budgetary and fiscal-policy decisions (Eichengreen, Wyplosz, 1998).

Game theory can shed light on the new conditions characterizing the creation of economic policy (Laskar, 1999). In the past, the *Bundesbank* and the German government had an interest in regulating monetary and fiscal policy in ways that fit the economic situation of their country, while other countries reacted with a “policy mix” aiming at maintaining parity with the Deutsche Mark. With the euro, the Central European Bank is supposed to adopt a monetary policy consistent with the aggregate of all European economies at the initiative of the ten, then eleven, Finance Ministers of the Member States whose policies are only partially coordinated within the euro-group which, in turn, is dependent upon the official authority represented by Ecofin (Jacquet, 1998). In this way, the euro has brought to the forefront the coordination of national economic policies, whose characteristics are reflected in evaluations by financial markets through such mechanisms as the trends in the exchange rate between the euro and the dollar.

Indeed, the euro’s vocation is to serve as a *key international currency* in competition with the dollar and the yen. Still another approach to analyzing the euro emphasizes the international economy. On the one hand, certain observers expected a restructuring of the investment portfolios of private actors such as central banks, a move that would have implied a revaluation of the euro relative to the dollar. The period 1999-2001, however, gave the lie to this prediction, and there exists no unanimous explanation of the euro’s relative weakness. . Certain analysts have invoked the vigor of the so-called New Economy in the United States, in comparison to its sluggishness in European countries. Others have questioned the objectives and management of the monetary policies of the ECB, itself exclusively concerned with the fight against inflation in contrast to the pragmatic approach of American authorities, who also consider growth and employment. Still others see in these policies the direct consequences of the expectations and conceptions of international institutional investors. Nonetheless, euro exchange rates have seemed to favor the return of growth in Europe by stimulating the competitiveness of the old continent, in particular the German economy, which has long been burdened by the costs of reunification and the difficulties of integrating workers into the “New Economy.”

Finally, research dealing with comparative *political economy* has emphasized the extent to which the euro has shaped the strategies of both employers and trade unions (Iversen, Pontusson, Soskice, 2000). According to this perspective, the fact that monetary policy has become independent of national economic performance has affected unions’ power in negotiations with firms, which could lead to disturbances in institutional hierarchies (Boyer, 2000a). During the period of strong growth in the 1960s, monetary policy often ratified the results of national wage negotiations, even if the exchange rate represented a mechanism of constant adjustment. With the advent of the euro and the deepening of the internal European market that it implies, industrial relations have been transformed to the point that distinct national modes of regulation that are enduringly different as a result of varied historical legacies and strategic decisions dealing with modes of insertion into international competition have emerged (Beffa, Boyer, Touffut, 1999).

The multiplicity of these paradigms and the conclusions to which they lead speaks in favor of the systematic character of the innovation represented by the euro. Given the richness of

analytical tools available to theoretical analysis and also the uncertainty of their conclusions, economists have begun to turn to another approach inspired by economic and monetary history.

The Ambiguity of the Lessons of Earlier Episodes of Monetary Integration

History provides many examples of the creation of new currencies, both private and public, and monetary history has continued to inspire economists from the emergence of the quantitative theory of money to the rise of electronic money. But the most studied development has been the rise of outbursts of inflation. Accordingly, the development of nation-states, linked to processes of monetary integration, has been revisited by contemporary economists after the launching of the euro.

Given that the European currency was supposed to promote the unification of the entire old continent, *American monetary integration* has been the most-studied example. The victory of the North over the South in the Civil War represented a first episode in this process of American monetary integration (Boyer, Coriat, 1984). Certain analysts have concluded, perhaps a bit hastily, that divergence of French and German interests regarding the management of the euro would lead to a war between the two countries (Feldstein, 1997), which would evidently violate the common understanding of the founding fathers of the European economy (Monnet, 1976). Indeed, at the time of the creation of the European Coal and Steel Community, it should be recalled, the aim was to reconcile the belligerents of the two world wars by means of trade and coordination.

A second application of American monetary integration aims to assess the United States' closeness-of-fit to the model of an ideal currency area and to compare it with Europe. Increasingly, comparisons between the nineteenth century United States and contemporary Europe have concluded that capital mobility was much greater in the United States, even if in the future one expects the euro to promote the emergence of an integrated European financial market. The differences are even more remarkable when one notes, on the one hand, the immense flexibility of the American labor market, and in particular migration from one state to another, and, on the other hand, the existence in Europe of local labor pools between which mobility is much less significant, since intra-European migration is constrained and limited to manpower whether skilled or unskilled (Ehrenberg, 1994). From this observation comes the frequent conclusion of (often American) researchers: rigidities of the labor market are the primary obstacles to the viability of the euro as well as the blossoming of the "New Economy" (Greenspan, 2000). One can easily notice the limited usefulness of such historical comparisons, in particular since they neglect the euro's impact on the transformation of labor-market institutions. Certainly, intra-European migration has not necessarily been accelerated, but it would be misleading to accord pride of place to the short-to-medium-term effects of monetary policy, given that migration is a long-run phenomenon.

The comparison of the euro with the dollar brings out yet another important difference. In the United States, the scope of economic policy is limited by a strict division of responsibilities between the central bank and those responsible for the federal budget. By contrast, Euroland exhibits an asymmetry between a common, and thus federal, monetary policy, and the coexistence of a wide variety of national fiscal policies. Given that analyses of the American case have demonstrated the importance of budgetary transfers from region to region in response to asymmetric shocks, the absence of any European fiscal federalism should be seen as an obstacle to the euro's viability (Eichengreen, von Hagen, 1996). From this perspective, some research has estimated the resources that would be required in a European budget in order to stabilize Europe's political-economic régime (Tondl, 2000). Nonetheless, one wonders if other institutional configurations are not available that would assure such stabilization. Either the adoption of common rules of medium-term budgetary management by each individual country, or concertation and coordination within the euro-group, would be capable of overcoming the

European budget's current incapacity to play the role of automatic stabilizer, given the provisions of existing treaties and the still-distant prospects for a European federal constitution, properly-so-called.

German reunification has offered yet another lesson about the impact of the fixing of exchange rates among currencies joined within the euro. To be sure, the decision to introduce a single exchange rate between the Deutsche Mark and the East German Mark made possible the integration of the two Germanys' monetary systems, but it did so at the cost of a loss of the competitiveness of the eastern *Länder*, leading to very different Eastern and Western economic trajectories, even as a strong budgetary solidarity led to significant transfers to the less developed *Länder*. The general lesson to be drawn from these events is simple: the irreversible fixing of exchange rates within a zone of monetary integration also fixes, in the medium-to-long run, the competitiveness of its respective regions, to the point that it can lead to a desynchronization of their economic conditions. One can interpret the differentiation of national economic performances since January 1999 as the expression of the same mechanism, although obviously on a smaller scale. In the long run, of course, economic specializations can develop that can re-equilibrate differences among rates of growth.

Thus, we see that the historical approach offers a different kind of clarification to that offered by theoretical formalizations. The former can take into account the entirety of structural transformations associated with monetary integration, in contrast to the waste produced by formal models, each one of which must limit itself to addressing a small number of mechanisms. However, recourse to history does not offer a certain response, since it is difficult to extract general or transhistorical characteristics from the idiosyncrasies of a particular case, unless one resorts to the method of comparative analysis of a set of case studies (Ragin, 1987), an approach that does not enjoy the favor of most economists.

Innovative Federalism in Search of a Theory

Recent research on the political economy of European integration suggests that policy-makers proposed the euro by with the aim of dealing with the new economic interdependence born from the success of previous stages of European integration (Moravcsik, 1998). In this context, the European currency was supposed to overcome the disequilibria that had come about in Europe since the collapse of the international system of fixed exchange rates, even at the risk of creating new internal coordination problems (Boyer (ed.), 1999). As a result, no available synthetic, forward-looking analysis can offer future projections about such a complex institutional edifice built over time. Theories of federalism could, however, represent an interesting point of departure for economists. That is not to say that federalism constitutes an entity as well defined as the centralized nation-state during the thirty "glorious" years of post-war growth. The federal system, by definition, incorporates a division of power among the federal government, states, and independent administrative agencies in charge of managing particular public services or questions of public interest (Théret, 2001). There are thus multiple forms of federalism, but none of them approaches the current structure of the European Union (Table 3).

Indeed, the EU displays unique traits to such an extent that many observers are reticent to think of the construction that has resulted from the treaties of Maastricht and Amsterdam as federalist. There clearly exist two federal responsibilities, monetary policy and the protection of competition within the single market. On the other hand, budgetary responsibilities are

TABLE 3: EUROPEAN INTEGRATION, A CHALLENGE FOR THEORIES OF FEDERALISM

1990s	United States	Canada	Germany	European Union
Foreign Affairs <ul style="list-style-type: none"> • Diplomacy • Defense • Trade 	Washington Washington Washington	Ottawa Ottawa + Consultation of the provinces Ottawa + Consultation of the provinces	Berlin Berlin Berlin then Brussels	Mr. PESC National + Embryonic European cooperation European Commissioner + Council of Ministers
Management of Money and Credit <ul style="list-style-type: none"> • Monetary policy • Oversight of credit 	Federal Reserve Decentralized at the state level	Bank of Canada Federal institutions	Bundesbank then ECB Federal institutions and the <i>Länder</i>	European Central Bank Central banks + institutions of national supervision
Fiscal Policy <ul style="list-style-type: none"> • Public expenditures • Taxation 	Double level: federal and state Mainly Washington, but fiscal resources at the state level	Shared Shared	Juxtaposition federal/ <i>Länder</i> Basically federal + <i>Länder</i> fiscal policy	Essentially member states + Sharing by the European budget Exclusively from the member states, who transfer a (modest) portion of their resources to the European budget
<ul style="list-style-type: none"> • Balancing among states 	Assured by both fiscal federalism and mobility of labor and capital	Strong as a result of fiscal federalism	Strong balance, slightly reduced at the end of 1990	Weak, but with a role for structural funds and Common Agricultural Policy
Competition <ul style="list-style-type: none"> • External • In the domestic market 	Washington Washington and states (corporate law)	Ottawa + Consultation of the provinces	From Berlin to Brussels Principle of competition at the federal level	Commissioner responsible for foreign affairs European Commissioner implements the directives of the single market
Wage Relationships <ul style="list-style-type: none"> • Labor law • Social protection 	Mainly states Certain specific risks at the federal level	Regions Shared	Federal level Federal level	Basically national but with European directives National with comparison to “best practices” in the EU

essentially the province of the member states, each operating within the constraints introduced by the Stability and Growth Pact. In reality, the pooling of resources under the title of “European budget” does not represent a truly federal fiscal mechanism, since no direct taxes are levied and Union authorities are not permitted to run a debt in order to play the role of economic stabilizer. Paradoxically, diplomacy, defense, and external trade negotiations are not full responsibilities of the EU, despite recent institutional advances. As a result, the euro seems to be a currency without a state, and thus lacks credibility in the sense intended by the principle that “membership in the currency, as a collective project and reflective of the principle of solidarity, is predicated upon an affirmation of the community” (Orléan, 1998).

For their part, labor-market institutions have remained almost exclusively national, with the exception of a few European directives. This is not the case in a federal state such as Germany, where the codification of wage bargaining, international competitiveness, and monetary policy traditionally enjoy complementary relationships that seemed to lie at the heart of this country’s healthy macroeconomic performance, at least until the beginning of the 1990s (Streeck, 1996). This simple comparison shows how improper it would be to imagine that the institutions of the Social Market Economy were simply transferred from Germany to the rest of Europe. Nor is the European configuration a mere copy of American or Canadian federalism.

From this uniqueness, both economists and political scientists are perhaps tempted to reach conclusions about the problematic character of the euro’s viability, but such a conclusion would rest upon the suppositions that existing configurations are viable. This, in turn, would represent a surrender to the teleological illusion that the only functioning federal systems are those for which coherent theories existed prior to their creation. If one were to revisit several major historical episodes of the twentieth century, one would see that an often radical uncertainty weighed upon actors’ strategic decisions (Lesourne, 2001). Thus, it would be a fictional exercise to suppose such a fit between theory and reality, since one must wonder under what conditions current European and national institutional constructions can shape viable modes of regulation over the medium-to-long run. A first stage in a related research agenda would entail an analysis of structural coordination problems and the provision of public goods on a European scale in order to draw the outlines of a European economic governing body (Boyer, Dehove, 2001). A second stage might venture to propose a series of scenarios in order better to test the structural coherence that should govern institutional development on several levels of the European Union (Boyer (ed.), 1999).

But the essential task is none other than the elaboration of formal models whose points of departure are the major traits of contemporary European institutional structures, models from which one can in turn derive lessons about policy mixes and the growth régime more generally. We do not seem to have at our disposal a theory that is applicable to evolving European federal structures. Once again we need an original synthesis of monetary history, political theory, and economic analysis: to the major innovation represented by the euro, there should exist a corresponding reconfiguration of analytical tools and analyses. This reconfiguration could be analogous to that represented by Keynesian theory in response to the emergence of monopolistic regulation and the Fordist growth régime, but applied to an era marked by growth of federal structures within a context of global finance.

THE NATURE AND CONSEQUENCES OF THE “NEW ECONOMY”

The emergence and distribution of information and communications technology (ICT) have often been presented as the indicators of a major change in technological systems and, as a result, of growth régimes. After the middle of the 1990s, this debate moved beyond the domain of specialists of technological change and became a focus of nearly all economists. This new interest was reinforced by the fact that, until the end of 2000, the United States witnessed an unprecedented economic cycle, resulting in the assumption that a new model of growth was

probably needed. In this context, the theme of the New Economy provided an excellent laboratory for the strategies deployed by researchers in reaction to supposedly radical innovations. For the purposes of this article, it is interesting to regroup contemporary research agendas with reference to the answers to two questions. The first inquires about the radical (or not so radical) character of the innovations associated with ICT. The second examines the extent to which the concepts of economic analysis should be rethought or simply adapted to a new problematic (Table 4). At the risk of oversimplifying a literature that is growing extremely rapidly, we have organized research paradigms with reference to four central problems.

Table 4: Does the “New Economy” Call for New Theories and Analytical Tools?

The phenomenon	Is embedded in past patterns	Offers some revisions	Is radically new
The theory should			
Remain unchanged	Neo-classical and Keynesian macroeconomics	Neo-Schumpeterians I	Neo-Schumpeterians II
Reconstruct its tools		Microeconomics of increasing returns and product differentiation	Theory of endogenous growth driven by knowledge
Develop completely new concepts			Theorists of digital society

Statistical and Econometric Approaches: No Significant Departure

ICT’s rapid growth poses first and foremost the problem of measuring the volume of its activity, and the rapidity of innovation and innovation of equipment and capital stock poses several methodological problems for statisticians. Technological choices relating to the construction of price indices influence our understanding of the dynamism of the New Economy. Almost all analysts recognize the emergence of new sectors related to computers and international networks, sectors which exhibit an acceleration of total factor productivity, often in a context of increasing returns. On the other hand, certain macroeconomists employ quantitative analysis of the sources of growth and conclude that the technological revolution was, at least until the end of the 1990s, limited to the production of ICTs and to the durable goods sector, and that nearly all sectors related to users failed to register an increase in total factor productivity (Gordon, 2000). What is more, a quite classic productivity cycle accentuated the short-term impact of the diffusion of ICT. Thus, the paradox of productivity, according to which we should see computers everywhere but in American productivity statistics (Solow, 1987), was only very imperfectly overcome during the long period of expansion of the American economy. This characterization is to be found in a number of macroeconomic studies (Brender, Pisani, 1999; Artus, 2001).

This contrast between daily observations—as well as the internet financial bubble—and statistical and econometric conclusions, has given rise to a number of interpretations that share a relativization of the impact of technology in the strict sense of the term. Indeed, in the absence of firm reorganization undertaken with a view to exploiting the potential represented by reductions in the cost of processing and transmitting information, firms are incapable of improving their

performance (Askénazy, 2000). Moreover, ICTs can favor centralization as much as decentralization, the homogenization of skills as much as their differentiation (Greenan, 2001).

The historian of economics and technology can identify an analogy between the diffusion of the electric motor and that of the computer. In both cases, a long period of maturation seemed necessary for the adaptation, not only of the internal organization of firms, but also of technical norms, skills, the local concentration of economic activity, and even shared infrastructures (David, 2000). Other studies confirm that several decades are necessary before a series of radical innovations, both institutional and technological, can effect the transformation of macroeconomic patterns. Such an outcome pertains to both the long-run growth régime in the United States (Boyer, Julliard, 1992) and to the mode of regulation observed in France over nearly two centuries (Bénassy et al., 1979; Chartres, 1995). As for the internet bubble, the judgment of historians of finance and currency is clear: such speculative episodes have precedents, such as the bubble associated with tulips and with the era of railroad expansion (Kindleberger, 1978). Belief in a “new economy”—characterized by the disappearance of earlier mechanisms and patterns—results less from an analytical and objective characterization than from misunderstanding or forgetting the lessons of history.

In this way, statisticians, macroeconomists, econometricians, and economic historians agree on the need to qualify the ostensibly radical character of ICT and its economic impact. But this conclusion is far from shared unanimously; at least three other interpretations have emerged.

A Simple Redeployment of Theoretical Tools of Microeconomics Would Suffice

The greatest dynamism of contemporary economic research relates to the renewal of macroeconomic theory. The ICT revolution, however, deals most directly with firms’ management of information. In this context, the novelty of the past twenty years has been predicated upon the digital production of information and the marriage of telecommunications and computer technology. From a microeconomic point of view, very large investments are required before one can benefit from very small marginal costs of production or distribution of information. Presented with these kinds of increasing returns, traditional microeconomic theory would have reacted by asserting the likelihood of a tendency toward monopoly.

Microeconomists, however, later rediscovered the heart of the Marshallian approach, which juxtaposed decreasing returns on the firm level with positive externalities across an entire sector. Network economics, made more relevant by the emergence of ICT, is based precisely upon such an hypothesis (Curein, 2000). The hypothesis of imperfect competition, which is appropriate for information technology since the producer is more familiar with the quality and significance of what he is offering than is the potential consumer, provides a second method for reconciling market equilibria with increasing returns (Shapiro, Varian, 1999).

This literature is careful to limit its analyses to informational products for which the costs of reproduction and distribution approach zero. This is not the case for most manufactured goods or for services, since the cost of information processing does not approach zero in these sectors, where increasing returns prevail. This second has as its focus the reconciliation of daily observations with aggregate statistics; the percentage of ICT in the overall production process remains moderate even in countries that are the greatest specialists in this area.

A Radical Innovation That Would Call for an Original Research Agenda

In the presence of accelerating productivity in ICT, it is far from obvious what conclusion one should draw regarding likely developments over the medium-to-long run. If one relies on standard microeconomic theory, a decline in prices of informational goods reflects their use towards increasingly unproductive ends (Gordon, 2000). If this were true, the basic outlines of the revolution of the “New Economy” would have already been realized, and, in any event, this

“revolution” would not share the intensity or scope of earlier technological revolutions. But if one adopts a Schumpeterian point of view, technological diffusion will likely follow a logistical curve of which the boom of the end of the 1990s would represent merely the beginning of a transformation of both modes of production and modes of life (Freeman, 1995).

Nonetheless, the cluster of innovations connected with ICTs would not reflect a strict reproduction of preceding technological revolutions, given the quite particular characteristics of information. On the one hand, the decline in the costs of reproduction and diffusion is unprecedented. On the other hand, information represents the supporting infrastructure for knowledge that is a public good in the sense that sharing it does not reduce its usefulness. It is upon such a foundation that the idea of a radical transformation in the sources of economic growth appeared, in the middle of the 1980s. If, after the first industrial revolution, growth resulted from the accumulation of a surplus created by “the use of goods to produce other goods,” the advent of the knowledge economy has led to an improvement in living standards through “the use of ideas to produce other ideas” (Romer, 1990). This concept lies at the heart of research on the endogeneity of technological progress (Aghion, Howitt, 1998), an hypothesis that is itself strengthened by the network effects that characterize the internet (Aghion *et al.*, 1999).

In a sense, this third approach represents an extension of the preceding one: one can recombine and reconfigure the tools of microeconomics with the ideas of asymmetric information and increasing returns. In view of the dominance of the knowledge economy, however, the economy’s macroeconomic characteristics are directly influenced, as are most institutions and organizational forms, whether the issue is intellectual property rights, regulation of competition, the internal and external organization of firms, financing mechanisms, education and training, or even the organization of infrastructure and public services. For adherents of this research program, such developments open up new avenues of research dealing with the radicalism of breakthroughs in information and in the knowledge-based economy.

A New Normative Model Would Suffice

The idea of radical innovation supposes that actors project themselves into a relatively distant future, the outlines of which are unclear, that differs from the past. At the same time, however, individuals have varying degrees of risk aversion, and such a scenario thus implies a polarization between the adherents of the old order and the visionaries who help to realize a brave new world. Such was the case for numerous innovations in industrial organization, of which the most striking example is probably that of Henry Ford, known as the founder of mass production and consumption (Boyer, Orléan, 1991). In this context, individuals or firms at the forefront of this type of innovation act as the propagandists of the model of which they are the bearers. Confronted by the fundamental uncertainty that is dominant during such historical periods, actors cannot rely upon a calculus of probability and a careful assessment of opportunities and costs. In such a dynamic context, the hypothesis of rational expectations, which is problematic even in the case of a complex but static economy (diversity of goods, technology, and interactions), is nothing short of theoretically heroic.

The hopes engendered by the New Economy are no exception to this theoretical conundrum. Certain analysts, either by necessity or from personal inclination, assumed the mantle of propagandists of ICT and adorned it with every conceivable virtue (Castells, 2000). For a believer in the market economy, won’t the internet allow the creation of typical competitive markets? For economists preoccupied by poverty and underdevelopment, the information economy is often presented as a great equalizer of opportunities. For those nostalgic for a socialist economy, the fundamentally social character of network technology (at which Linux might be more effective than Windows), and even more so, of processes of information production, might be an omen of a future society that may become, albeit altogether unintentionally, the embodiment of certain communist ideals.

“Animal Spirits” More Than Rational Calculation?

The financial community, which is so prudent in its investments in mature industries, came to believe in the irreversible character of the ICT revolution. This belief took root to such an extent that it gave rise to a financial bubble that, until the end of the 1990s, did not appear to be a bubble at all for many actors, who ended up believing in the self-fulfilling character of their prophecies. The history of past episodes, however, shows that mirages of a “New Economy” always end up in a readjustment of actors’ claims with regard to the capacities of the real economy (Kindleberger, 1978). It is thus more honest to refer to the “animal spirits” of Keynes, for example, than to pretend that his vision was the product of a purely rational calculus. In other words, in the context of innovations, it is beliefs more than strategic calculations that dictate the behavior of economic agents. One must remember that economic analysis inevitably comes up against certain intrinsic limits, a fact which is merely an extension of Karl Popper’s criticism of Marxism’s claim to have demonstrated the deterministic relationships that govern the development of capitalism.

THE LIMITS OF ECONOMIC ANALYSIS CONFRONTED BY EPOCHAL INNOVATIONS

This lesson is not unique to emerging growth régimes, but rather is common to the two other examples of our argument represented by the great Russian transformation and the introduction of the euro. Indeed, these examples can be used to tease out a more general conclusion: the characteristics that lend strength to the analytical tools of economics used for the study of recurrent phenomena along a stationary trajectory of growth are themselves the sources of the interpretive difficulties that economists encounter when dealing with unprecedented events.

Comfortable but Unrealistic Hypotheses

The hypothesis of substantive rationality is quite effective since it allows theoreticians to derive rigorous assessments of behavior from a set of constraints and incentives conveyed by an agent’s environment. But this supposes both a familiarity with the reaction functions of other agents and a capacity for collecting information and making complex calculations. In none of the three kinds of potentially epochal innovations discussed here, however, are these conditions met. In the great Russian transformation, the novelty and instability of the institutional, financial, and political environments made rational calculations on the part of entrepreneurs quite difficult. Arbitragists, intermediaries, and speculators prospered more easily than Schumpeterian innovators. The basic actors were not the entrepreneur, the banks, and the state, but rather a series of organized groups hoping to increase their power and wealth to the detriment of their competitors. Other obstacles are relevant to an attempt to evaluate the impact of the euro. Given the multiplicity of new interdependencies that have emerged and the largely experimental character of the first steps of the European Central Bank, it has been quite difficult, even for the best-informed agents in the financial markets, to anticipate changes in interest rates, parity between the euro and the dollar, and the rate of growth across Europe or its distribution among countries in the euro-zone. Calculations by economic agents are also affected by uncertainty about the credibility of a currency that was not the product of any sovereign body. For its part, American patterns of growth in the 1990s, colored first by euphoria about the potential of the “new economy” and then its reevaluation, underline the limits of a coldly rational approach in the wake of innovations that actors tend to see as unprecedented and resistant to economic calculations.

Table 5: The Difficulties of Economic Analysis Confronted by Three Epochal Innovations

Field of application	<i>The Great Russian Transformation</i>	The Euro	The New Economy
Characteristics			
Hypotheses			
<ol style="list-style-type: none"> 1. Substantive rationality 2. The market as sole form of coordination 3. Rationality of conceptions 	<ol style="list-style-type: none"> 1. Interference with capacities for calculation by the environment. 2. Determinative role of networks (sites of solidarity, credit, connected to political power, mafias,...) 3. Unpredictability of the environment and the rules of the game 	<ol style="list-style-type: none"> 1. Beyond the reduction of transaction costs and uncertainty, a questionable sovereignty. 2. A coordination problem between national fiscal policies and the ECB, a problematic relationship to labor-market institutions. 3. Heterogeneity of expectations regarding the role of the euro/ 	<ol style="list-style-type: none"> 1. Freeing (provisional) of rational criteria of evaluation of investments. 2. Role of networks (risk capital and researchers, universities and firms, personal relationships). 3. Rational mimicry but unsustainability of stock values.
Properties			
<ol style="list-style-type: none"> 1. All agents know the “true” model of the economy 2. Reversibility of actions in the vicinity of an equilibrium 3. Inherent ineffectiveness of public actions 	<ol style="list-style-type: none"> 1. Unexpected and changing properties of the economy, even for the best-informed actors. 2. The choice of a reform strategy irrevocably distances itself from the initial equilibrium 3. The absence of a state apparatus mortgages the construction of the institutions of a market economy. 	<ol style="list-style-type: none"> 1. Experiments and learning by actors in economic policy and private actors. 2. Fixed internal exchange rates, path-dependence of institutions associated with the creation of the euro. 3. Changing properties and evolutionary dynamics on the part of economies in the euro-zone. 	<ol style="list-style-type: none"> 1. Experts disagree about the nature, originality, and viability of growth driven by ICTs. 2. Errors of analysis and prediction are reflected in debt accumulation, and thus, financial fragility. 3. Role of reforms (defense, taxation, finance, pensions) in the emergence of this growth régime.

It must be remembered that *the market* is far from the sole form of coordination, even if a commercial logic has made new conquests during the last two decades. If one adopts a rigorous definition of a market economy (White, 1981; Boyer, 1996), it is difficult to conclude that Russia is in the midst of a transition to market capitalism, given that many different kinds of networks have organized the circulation of information, goods, capital, and even an embryonic, if only locally situated, kind of order. The fracturing of the Russian economic sphere and the fragility of the payment system have mortgaged the very foundations of the market.

The configuration is different in Europe, where several centuries of trial and error have permitted the construction of markets endowed with efficiency and a certain legitimacy; nonetheless, the construction of the single market is incomplete (Fligstein, 1996a; 1996b). Furthermore, the development of the euro poses the question of which non-market coordination procedures are required to assure its viability: coordination among national governments and the ECB, precise definitions of Community responsibilities with regard to the principle of subsidiarity, the development of professional relationships, and/or a capacity for social protection capable of responding to demographic and social changes. The question of sovereignty goes back to the organization of political power within the EU, since financial markets form their views with reference to the character of coordination between national and European authorities.

Finally, the dynamism of ICTs does not arise solely from liberating the stimulus of competition, since if one looks at the heart of Silicon Valley, one notices immediately that a network logic governs the circulation of information, the development of skills, the emergence of norms allowing modular production, and original forms of relational financing (Aoki, 2000). In the heyday of the “new economy,” stock markets took off in response to supposedly flawless organization of firms and to a belief in an endless era of prosperity.

As part of such an analysis, one must also look into how new concepts are formed. The hypothesis of *rational expectations* has opened up new perspectives for economic theory involving the search for coherence between expectations and results. A heuristic and enlightening hypothesis for modeling partial equilibria, this hypothesis becomes problematic when epochal change suggests new interdependences among finance, currency, work, changing technology, etc. Could the concrete economic agent, drowning in incertitude with respect to the consequences of his actions, be better situated than the theoretical economist, who cannot manage to explain the nature of these interdependencies? Could the former resident of the *kolkhoz*, whose pension remains unpaid for several months and who is forced to sell petty objects to assure his survival, be more familiar with the economy than the Russian Economics Minister who, in the summer of 1999, admitted that he was incapable of formulating a coherent set of economic policies since he did not understand the forces behind the development of his economy? Could exchange markets be the expression of conceptual heterogeneity relating to the determinants of the value of the euro? Is it worth of note that no econometric function describing the formation of rates of exchange between the euro and the dollar has managed to provide a robust estimation of their equilibrium exchange rate (Borowski, Couharde, 1999)? We need not even speak of the illusions stirred up by ICT among thousands of stock traders, who were actually relatively well informed and are usually able to evaluate possibilities with a certain rationality. The internet bubble once again showed that “the pooling of individual rationalities, such as they are organized by the financial markets, does not tend to produce a well-informed, pertinent collective rationality” (Orléan, 2000).

Thus economies, even those governed by a market logic, have to take into account other forms of coordination that contribute, often in a determinative way, to their development and their macroeconomic performance (Boyer, Hollingsworth, 1997). Rationality is no longer merely bounded, but rather situated and largely informed and determined by institutional contexts. Finally, concepts of the workings of an economy always go beyond traditional calculations, which are essentially incapable of breaking through the radical uncertainty that characterizes epochal innovations.

Interpretations That Do Not Fit with Observations

In light of all of this, it is unsurprising that explanatory factors derived from standard economic analysis have trouble in gaining adherents, since observation provides multiple examples that refute the three basic propositions of this kind of analysis: first, knowledge of the true economic model by all agents; second, the reversibility of actions and equilibria; and third, the idea that public policy, always and everywhere, can only damage economic equilibria (Table 5 above).

It follows from the preceding analyses that the implicit model of the economy is beyond the reach of economic agents in a stationary environment, and even more so in a period of rapid structural change. The three examples being explored in this article all demonstrate the importance of a process of *experimentation and learning* in the context of a changed institutional, technological, or political environment. The great Russian transformation also shows that instability in the rules of the game, such as in the process of learning, cannot work itself out within a decade. The introduction of the euro has, to be sure, been much more constrained by European institutions and the workings of the international financial system. Nonetheless, both the ECB and national political authorities need to become familiar with the new conditions in which they must interact; if they do not, they risk eliciting the resistance of international investors (Boyer, 2000b). Large multinational corporations are confronting a market that is better integrated than in the past and, since January 1999, they have been developing a more European approach to both the processes of production and its finance. That said, we must not forget that the introduction of the euro as the sole means of payment will affect the behavior of both consumers and workers in ways that are difficult to predict. The hypothesis of the neutrality of money in the medium-to-long run, which is so influential in theoretical formulations, is moreover much less useful for the study of this period of transition. Finally, the collapse of the internet bubble demonstrates that few firms in the new economy had constructed a coherent and viable organizational model, just as the users of ICT failed to realize the range of its potential benefits. But the greatest discrepancy relative to the hypothesis of full knowledge of the properties of the new economy is to be found in the over-investment and accumulation of debt due to expectations that are excessively optimistic. From the time that the internet convention was abandoned, investment errors worked their way into the structures of balance sheets and led to a potential fragility in the credit system.

In this context, we can see the limits of potential adjustment in the vicinity of an equilibrium of totally *reversible* phenomena. By contrast, the trajectory followed during a period of expansion continues to mark periods of readjustment and recession, such that the equilibrium of the pre-ICT-boom period seems out of reach. We are confronted with the phenomenon of *hysteresis*, which became increasingly familiar to economists starting in the 1980s (Amable *et al.*, 2000). The passage of the Soviet régime to a more competitive, open economy changed the basic institutions of the system to such an extent that the prior equilibrium is now out of reach, due to the destruction of skills and major changes in the concentration of revenues and wealth. In much the same way, the unequal diffusion of ICT in the United States, Europe, and Asia has been evident since 2000, since none of the three converged on a common equilibrium. Indeed, their degree of specialization has actually increased and their choice of economic and social policies have remained distinct (Boyer, 2001; Boyer, Souyri, 2001). These developments demonstrate a high degree of path-dependency relative to both the externalities associated with particular technological paradigms (Dosi, 1982; Dosi *et al.*, 1988; Arthur, 1994) and the interdependencies created by a particular institutional framework (David, 1988).

The typical model of a market economy ignores most such externalities and fails to deal with either public goods or the legal and social conditions conducive to a society based upon private property. When one reintroduces these characteristics, state action ceases necessarily to

be ineffective—the state can take private resources and devote them to uses that are inherently unproductive—such that public authorities can play a determinative role in the nature and pace of growth. Russia shows how the withering of the state can preclude the transition to a market economy. The euro, a clear result of political decisions, can stabilize the competitive relationships between member states and limit the impact of international financial crises: in this sense, the European currency is contributing to the improvement of the situation on the old continent. Finally, ICTs emerged from initial efforts in the American defense sector and then their redeployment elsewhere, and the dynamism of the American economy in the 1990s resulted from the success of a series of reforms of fiscal policy, the labor market, pension financing, and financial and monetary policy (Boyer, 2001a). But the most important argument is probably that political authority represents an essential force behind reforms in response to a wave of epochal innovations (Chartres, 1995). The experience of countries formerly subject to a Soviet-type régime (World Bank, 1996) and the lines of division between countries that have industrialized and developed dramatically since the 1980s and those that have not (World Bank, 1993; 1997), convinced certain international organizations of the state's potentially positive role in the construction of the institutions necessary to a knowledge-driven development strategy (World Bank, 1998) and the fight against poverty (World Bank, 2000).

Figure 2: How Do We Analyze a Supposedly Radical Innovation? Seven Strategies

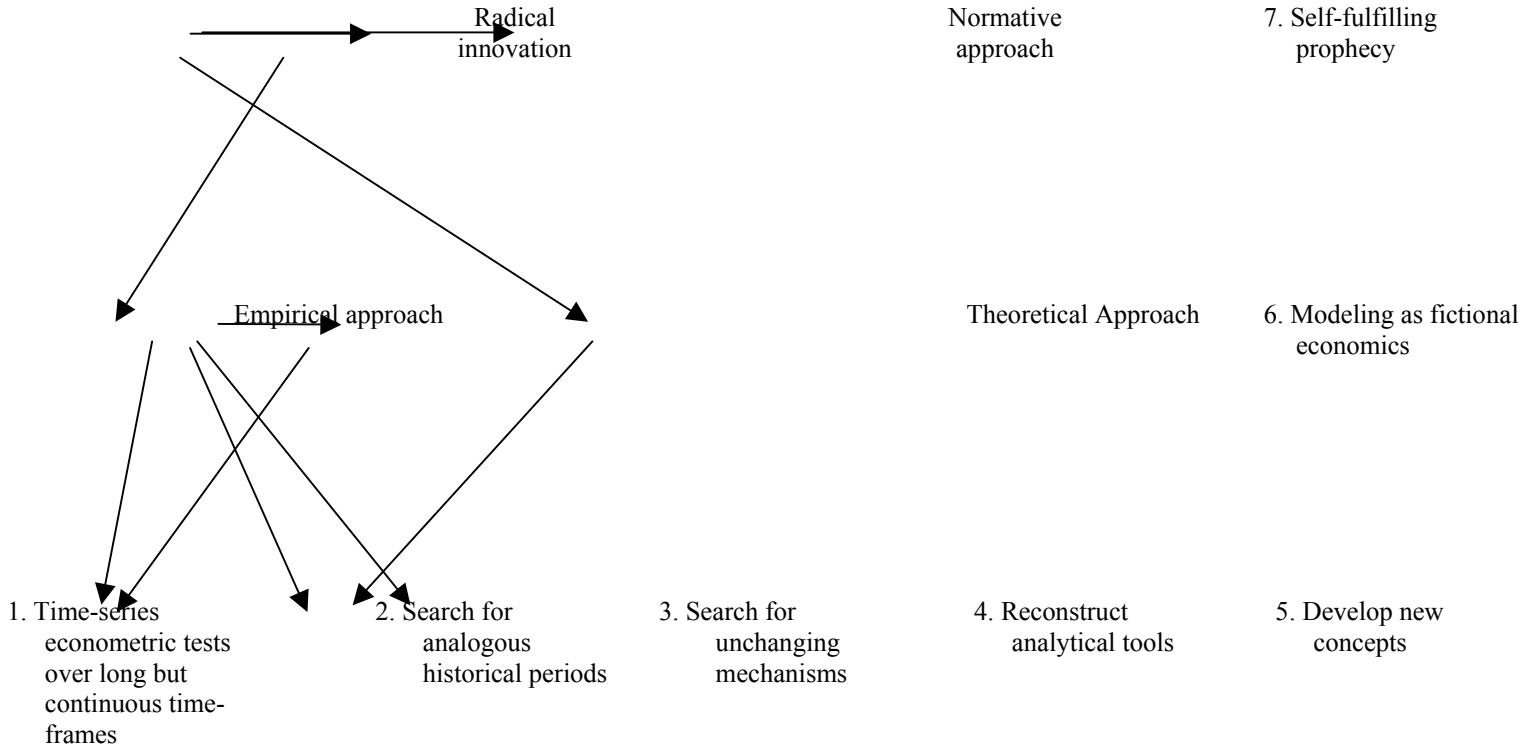


Table 6: Three Epochal Innovations Viewed by Different Approaches

Experiences	The Great Russian Transformation	The Euro	The New Economy
Approaches			
1. Econometric test of departures from established patterns	A great deal of evidence (growth, inequality, life-expectancy)	Inflection of changes initiated by the SME	Conflicting evidence, but presumption of an increase in total factor productivity
2. Search for an analogous historical period	Collapse of the Austro-Hungarian Empire	American monetary integration, but with significant differences	The invention of the dynamo and its repercussions
3. Update unchanging mechanisms	Monetization of public debts and inflation	Factors of credibility in monetary policy	<ul style="list-style-type: none"> ▪ Emergence of a speculative bubble ▪ Belief in the disappearance of the business cycle ▪ Over-accumulation in the new sector.
4. <i>Reconstruct tools of previous analyses</i>	Economics of disequilibria, models of economic policy	<ul style="list-style-type: none"> ▪ Use of the Mundell-Fleming model ▪ Game theory applied to the formation of a “policy mix” 	<ul style="list-style-type: none"> ▪ Microeconomics of increasing returns with imperfect competition ▪ Theory of endogenous technological progress
5. Develop new concepts and methods	Explication of necessary and sufficient institutions for a market economy	Search for a general theory of federalism	<ul style="list-style-type: none"> ▪ Analysis of information as a commercial good ▪ Economic theory of knowledge
6. Modeling as fictional economics	Models of calculable general equilibrium standardized across market economies	Model of redeployment of portfolios on an international scale	Pure model of the production of ideas by ideas
7. Model of self-fulfilling prophecies	Convince authorities—and the entire population—of the benefits of a market economy	Convince the international financial community that the euro will be a “strong currency”	Emergence of an internet convention dealing with new financial markets

WHICH TOOLS ARE AVAILABLE TO THE ECONOMIST FOR STUDYING EPOCHAL INNOVATIONS?

In reaction to major changes since the collapse of the pattern of post-war growth, economists have significantly enriched the range of instruments at their disposal for analyzing the stylized facts that shape debates over economic policy. As a result, the canonical model of general equilibrium has become no more than a normative reference point, since economic research has adopted a much more pragmatic approach to the development of the concepts and methods of economic analysis (Figure 2). It is thus possible to apply these diverse methods to the cases of Russia, the euro, and ICTs (Table 6).

When one attempts to analyze supposedly radical innovations, it is a good idea first to ask if they reflect transformations of individual behavior and macroeconomic patterns. This strategy leads to contrasting results when applied to the three innovations under examination in this article. Clearly, all statistics confirm that there was a rupture between the Soviet era and the transformation that Russia has undergone since 1989: a contraction of production lasting more than a decade, rising economic inequality, increasing poverty, a drastic reduction of public investment, and a renewed decline in life expectancy. The euro is part of continued efforts to stabilize intra-European monetary parity: if, in institutional terms, we can see a régime change after 1 January 1999, we must also recognize that current evolutions in interest rates, credit, and exchange rates all have their roots in the preceding decade. If one combines the statistical method of co-integration with systematic tests of the stability of observable long-term relationships, one can see that new factors governed exchange rates between the franc and the deutsche mark after the mid-1980s (Gouriéroux, Peaucelle, 1989). The European Monetary System clearly marked a régime change that was merely extended by the euro. The application of the same criterion of the stability of macroeconomic relationships, however, does not yield an equally clear result when one looks at the impact of ICTs (Gordon, 2000; Jorgenson, Stiroh, 2000). It is difficult to demonstrate the dynamics of or changes in technology without reference to observations over one or even several decades, in direct contrast to how one treats observable patterns in financial variables. On the other hand, we can say that research dealing with long-run relationships and tests of their stability clearly shows a succession of contrasting growth régimes governing the American economy over the period 1890-1991 (Boyer, Julliard, 1992; Julliard, 1995). The advantage of the econometric method of identifying structural changes is that it provides a rigorous test of propositions that may be based upon a relatively limited number of observations or even simple anecdotes. Such an approach can show, for example, that Japanese firms' relationships with their employees, for which the press delivered epitaphs throughout the 1990s, continues to shape labor-market adjustments there (Boyer, Julliard, 1997; 1999). It is a unfortunate that this cautionary method is not more often used when dealing with arguments shaped by "common sense" and various methodological fads.

Taking Another Look at Analogous Episodes in Economic and Social History

Nonetheless, it can be the case that a change is unprecedented relative to the immediately preceding period, but comparative economic history can provide one or even several examples of similar changes arising elsewhere and at other times. The collapse of the Soviet Empire, for example, shares several characteristics with the dissolution of the Austro-Hungarian Empire. Although a division of labor existed within the Comecon, the opening of these countries to the rest of the world introduced an outward-looking orientation similar to that observed in central Europe during the previous century. We have already mentioned the usefulness of a comparison of European monetary integration with other examples of monetary union, such as the American and the German cases.

But historical comparisons are probably most enlightening of all for studying the “New Economy.” This episode is certainly not the first example of a technological revolution in the history of capitalism, and as a result it is useful to see if the profile of ICT diffusion more or less faithfully follows that of the electric motor (David, 2000). One could extend the field of comparison even further by considering all of the productive models that have succeeded one another since the emergence of industrial capitalism (Boyer, Freyssenet, 2000). Likewise, the association of an ostensibly cutting-edge innovation with a financial bubble is far from unprecedented—such developments are to be found in several historical periods (Kindleberger, 1978; Shiller, 2000). Arguments similar to those being advanced today, such as the obsolescence of categories of financial valuation and the need to adjust them to new sources of productivity and profit, have been offered in response to a wide range of historical events. Finally, oracles of a “new era” that sweeps away old obstacles have often been applied to the ostensible disappearance of the business cycle, which was posited as an omen of unlimited and universal prosperity before the 1929 crisis in the United States (Heffer, 1976). A similar diagnostic emerged at the end of the 1960s (Bronfenbrenner, 1969) following the adoption of Keynesian policies, just a few years before the collapse of growth resulting from the two oil shocks. Paradoxically, the study of economic and financial history suggests that the emergence of the theme of a “new economy” or a “new era” could even be considered the leading indicator of a coming crisis and a disequibrated régime.

It is thus a shame that most contemporary researchers neglect the lessons of history; economists who manage to combine history and economic theory generally provide much sounder analyses than those who adopt a purely deductive approach based upon hypotheses that are not drawn from empirical observations. This has certainly been the case with the theme of “globalization”: many analysts who posit the radical character of contemporary internationalization simply do not take into account the lessons of numerous historical works dealing with this question (Bairoch, 1996; O’Rourke, Williamson, 1999). Contemporary economic theory stands to gain a great deal from developing hypotheses and frameworks with reference to the lessons offered by economic history.

Searching for Invariant Partial Mechanisms across Historical Periods

That said, simple comparison can be dangerous: it is risky merely to point out contingent and superficial analogies suggested by simple indicators of the evolution of an economic system. For example, when, in 1987, the Dow Jones suffered a decline similar in magnitude to that of Black Friday in 1929, certain analysts concluded that there was a major risk of an economic depression identical to the one that developed in the United States between 1929 and 1932. Subsequent experience would show that a stock market crash would not have the same macroeconomic impact, given the existence of the administrative regulatory régime that replaced the competitive regulation of the inter-war period (Boyer, 1987). As a result, it is more prudent and fruitful to try to update the partial mechanisms and linkages that transcend historical epochs, by virtue of which they enjoy a certain general applicability. This method, however, yields uneven results when applied to the three innovations under review here.

Although one can apply the lessons of disequibrated economies (Bénassy, 1984) to the study of both the Soviet period (Kornai, 1984) and the period of economic liberalization (Kornai, 1992; 1999), it is not easy to find mechanisms throughout history that are equivalent to those at work in Russia since 1990. As we have already observed, the common European currency is also to a great extent historically unique, even if we can place it within a more general theory of the actions and objectives of central banks (Thygesen, 1992). The evolution of the euro’s exchange rate can also be interpreted in light of theories pertaining to central bank credibility, as well as those pertaining to the linkages between sovereignty and a currency’s legitimacy (Aglietta, Orléan, 1998).

Likewise, the linked dynamics of the emergence of ICTs and ongoing financial innovations should take into account two historically recurring mechanisms. The first is that proposed by Joseph Schumpeter: the dynamics of a capitalist economy are periodically subject to sudden growth resulting from a series of radical innovations leading to a period of expansion during which the goods, processes, and organizations initially introduced by entrepreneurs in the strictest sense become more widely spread and overcome the routines characteristic of a Walrasian equilibrium (Schumpeter, 1911). This mechanism was finally formalized by neo-Schumpeterian economists (Dosi *et al.*, 1988), who thereby lent intelligibility to a phenomenon recurring within market economies. The second mechanism relates to the rise and fall of speculative bubbles. It is easy to understand why economic actors, when confronted with the opaque consequences of a radical innovation, tend to trust intuition and conventional wisdoms rather than the more difficult estimation of fundamental values. As a result, the phenomenon of over-adjustment, through recourse to bank credit or stock market fancies, takes off with a vengeance, leading inexorably to an increasingly fragile financial structure as the system begins to come up against the boundaries of profitability (Minsky, 1982). This type of analysis provided a warning of the possible collapse of the internet bubble, in conjunction, incidentally, with the prognoses of historians and certain financial specialists (Shiller, 2000). Both of these methods—the search for historical precedents and the advancement of partial yet general mechanisms—thus call for qualification of the novelty and radicalism represented by reputedly unprecedented innovations.

The Reconfiguration of Existing Tools within a Particular Model

One should not conclude from this kind of research, however, that general economic dynamics have remained unchanged. In fact, it has been demonstrated that there are no statistical macroeconomic regularities that remain constant across centuries because the very categories of economic activity have changed and continue to change as a result of a series of radical innovations. For its part, historical research conducted from the perspective of regulation approaches provides ample empirical evidence of changes in modes of regulation over the last half-century (Bénassy *et al.*, 1979), just as it does for changing modes of coordination of economic activity in the contemporary period (Amable, Barré, Boyer, 1997). Given these developments, the economist's task should be to identify mechanisms that are constant across time, mechanisms which must nonetheless be reconfigured to take into account new behaviors associated with radical organizational, institutional, or technological innovations.

In the case of the euro, it is possible to use an amended Mundell-Fleming model (Fleming, 1962) to define the effects of irrevocable internal parties on the effectiveness of national fiscal policies, even as one interprets changes in the external value of the euro in response to the decisions of the ECB from the perspective of flexible exchange rates. Likewise, the versatile framework provided by game theory permits an explanation of a new series of dilemmas emerging from the distribution of authority among supra-national and national institutions, as governed by European treaties (Laskar, 1999). The advantage of game theory is that it takes into account variations in the rules of the game and coordination procedures; its disadvantage, however, is that it involves excessive sensitivity to the details of particular hypotheses, some of which are purely technical.

It is probably the economics of information technology that represents the most promising area for a reconstruction of analytical tools. Given recent enrichment of the concepts of microeconomic theory, it has become possible to formalize the effects of the digitization of information and the creation of networks (Shapiro, Varian, 1999), and, by extension, the effects of innovation more broadly on the dynamics of economic competition. The results of such an analysis are original but do not necessarily give us the components of a coherent analytical model. Although they represent an elegant solution to the problems posed by unprecedented

technological innovations, it is possible to anticipate the effects of such innovations only due to conceptual progress made in a whole series of theoretical domains. It is true, however, that these results are parsimonious, meaning that they can explain a broad range of phenomena with a single set of concepts and a minimum of *ad hoc* hypotheses.

Developing New Concepts and Methods

If the preceding steps are not sufficient to produce a satisfactory interpretation, one must rethink one's theories and analytical tools. If history produces new entities (commercial banks, limited-liability companies, trade unions, institutional investors, etc.) or abstractions (bills of exchange, double-entry bookkeeping, commercial law, collective bargaining, etc.), the theorist must take these into account and develop the necessary methods for understanding the nature of these innovations and their economic consequences.

In this context, we have emphasized that the difficulties of the Russian economy—and the more general phenomenon of non-development—gave rise to renewed interest in theories of the state, institutions, organizations, and networks (World Bank, 1996; 1997; 2000). For the research agenda of the Regulation School, this represents an invitation to explicate the necessary and sufficient institutions for the emergence and viability of a market economy embedded in a democratic political system (Sapir, 2000; Chavance *et al.*, 1999). Regarding the euro, the big question is that of the articulation between the spheres of politics and monetary regulation in an era dominated by international financial markets (Orléan, 2000), which have imposed new norms of management for both firms and governments (Lordon, 2001). In a sense, theories of monetary policy credibility, which have developed hand-in-glove with the liberalization of financial flows, need to be extended by a theory of the legitimacy of the new currency (Aglietta, Orléan, 1998). But the uniqueness of the distribution of power in the EU, including responsibility for economic policy, calls for a return to analyses of federalism (Dehove, 1997) using analytical tools from political science, constitutional and international law, and, of course, economics. The comparative method can prove enlightening and inspire new theorizing in such a context (Watts, 1996).

If one takes seriously the generalization of information technology and the critical importance of knowledge in the birth of innovations, one must also address the need for work on the precise formulation of intellectual property, of the relationships between public research and private R&D, and of the organization of skill transmission. Incidentally, the implicit emphasis here on education, research, and health invites a reinterpretation of earlier periods of growth from a perspective that is distinct from that suggested by traditional theories of growth based upon the accumulation of surplus goods, wealth, and capital rather than knowledge or expertise.

Modeling as Fictional Economics

It is problematic to claim to have explained the forces governing institutional and technological change, since such a claim merely represents a claim, kept alive for a time by Marxist theory, that historical experience has largely refuted. Given this dilemma, another possible method involves recognizing the inherently arbitrary aspects of forward-looking analyses, while trying to circumscribe one's analysis through both an awareness of the errors of the past (Lesourne, 2001) and a clear recognition that any prediction of the consequences of a supposedly radical innovation said to lead to irreversible and unprecedented structural changes involves a *thought-experiment*...and even *this* is a problematic characterization!

In this way, one can reinterpret models of general, calculable equilibria. They do not necessarily describe the slow process of the introduction of market mechanisms, in Russia for example, but rather attempt to delineate a possible final equilibrium in an economy in which such reforms have been completely successful. This approach involves neither a prediction nor a

norm, but rather an investigation of one possible future, under certain conditions, representing an analytical short-cut which the model does not make explicit. The euro lends itself well to this type of analysis, particularly if one considers its long-term consequences. As it happens, the causal links are so tangled and incorrigibly plural that it is prudent to imagine not one scenario but several (Boyer (ed.), 1999); Fitoussi *et al.*, 1999). The model that follows from an explication of a coherent set of hypotheses should have as its aim the exploration of the viability of the system and its political as well as economic components (Boyer, 2000a).

But the difficulty involved in such an analysis comes from the multiplicity of interpretations, and as a result, of the multiplicity of models that one can assign to the same set of economic phenomena. For example, certain researchers have inquired about the possible heirs of the post-war growth model. Some analysts have proposed a simple amendment to the ideas of production and mass consumption, taking into account the increasing differentiation of goods by quality and degree of innovation (Coriat, 1991); others have posited a wholesale decline of industry in favor of services, and still others the dominance of cross-border competition (Petit, 1998). In light of the vigor of innovations in finance, the rapidity of their diffusion on an international scale, and their ostensible impact on the mode of corporate governance and the direction of economic policy, it seems that finance itself could be at the heart of a new model growth régime derived from the formulation and extension of developments since the mid-1980s (Aglietta, 1998). In this last case, a simple model allows us to determine under which conditions such a régime could be viable in the short-to-medium run and to identify the characteristics of a major crisis within it (Boyer, 2000c).

If one adopts this point of view, it seems that many contemporary studies are actually works of fictional economics: what would happen if...? Basic hypotheses are derived by isolating a small number of key mechanisms and combining them within a model rich enough to give rise to a single or several equilibria. If, for example, we argue that biomedical advances will permit human cloning, then we must inquire about the final equilibrium of such an economy (Saint-Paul, 2000). It is easy to see in this case that we should have arrived at the very opposite of the first of the proposed exercises, which involves meticulous empirical analysis of departures from economic patterns. Such an exercise is not uninteresting, however, since the economist can use it to make explicit his vision of the world, as well as to recognize the contingent character of the model that he sets forth and the entirely hypothetical nature of his results.

Clearly, the economist in this case is the architect of virtual modes of regulation whose realization is problematic. He could even be tempted to pose as the ambassador of his preferred mode of organization.

Radical Innovation as Self-Fulfilling Prophecy

A final approach, developed through the extension of such a method, can be constructed using the insights of the conceptual revolution of rational expectations. So-called “Keynesian” macroeconomic models employed adaptive, or backward-looking, expectations: in a manner of speaking, enduring under-employment was seen as the result of pre-existing problems in the labor market. The *General Theory*, however, developed a completely different vision, based upon analysis of financial markets: each person was said to form expectations based upon his prediction of the expectations of other economic agents, in keeping with the famous image of a beauty contest (Orléan, 2000). Contemporary theorists have revised this hypothesis and proposed models in which the expectation of future values determines present strategy. In so doing, economists (Azariadis, 1981; Azariadis, Guesnerie, 1986) have run into an old question of sociological theory: under what conditions does a prophecy turn out to be self-fulfilling?

This question is clearly relevant to the functioning of financial markets: while common sense tends to perceive speculative behavior as irrational, the theory of financial bubbles has shown that systematic discrepancies relative to the fundamental value of a financial asset are

compatible with rational expectations (Blanchard, Watson, 1984). This problem is *a priori* interesting for understanding both the evolution of NASDAQ internet stocks and rates of exchange between the euro and the dollar. Thus, the general adoption of a belief in the “new economy” or in a weak euro could explain American growth in the 1990s and the depreciation of the euro from 1999 to 2000, respectively. The idea is seductive but efforts to verify its relevance have not, it seems, stood up to tests of the general applicability and durability of a macroeconomic equilibrium of self-fulfilling expectations (Farmer, 1999). Either returns to scale must be greater than suggested by econometric work, or we need to introduce at least two sectors and two goods, or we must recognize that production frameworks and agents’ preferences are interdependent.

When we are confronted with the problem raised by agents’ reaction to a radical innovation, it is even more difficult to accept the general applicability of rational expectations: *a priori*, agents have widely varying perceptions of the future, for example, of the development of information technology. Once we have admitted that variance, we must also recognize that it is only through the financial markets that a rational mimicry capable of forcing all agents to recognize market values can emerge. Finally and above all, the profitability of ICTs observed *ex post* can prove inferior to market expectations, leading to a fall in stock values and a revision of beliefs. Moreover, the difficulties of the Russian economy, in which political authorities and a large segment of the public were attached to a belief in a relatively easy and rapid passage to democracy and a market economy, demonstrates the extent to which the heterogeneity of situations, interests, and conceptions can destabilize an equilibrium around self-fulfilling prophecies. Are not unexpected consequences resulting from rational action actually more common than self-fulfilling prophecies?

Clearly, epochal innovations serve to reveal the strengths and weaknesses of contemporary economic research. They threaten the hypothesis of a stationary world governed by rational behaviors and beliefs, but at the same time they suggest new hypotheses and theories. It is time that we sketched the outlines of these new ideas.

CONCLUSION: A CHANGE IN COURSE FOR THEORY?

The great Russian transformation, European monetary integration, and the technological paradigm associated with ICTs represent only three examples that merit further study. Each of these three, however, provides us astonishingly similar lessons.

Theories of Permanent Régimes in the Wake of Structural Change

The first thing we notice is a paradox: on the one hand, the evolution of academic institutions and the organization of expertise by public and private decision-makers has led to the domination of a general and powerful paradigm, which nonetheless restricts our vision due to its failure to recognize historical change. On the other hand, the current era is colored by major transformations of societies, institutions, technologies, and relationships between the local and international levels. Disequilibria in one area have repercussions in others, unintended consequences of supposedly rational actions are widespread, and the best-informed experts are constantly surprised. The Russian turn towards the market, which was initially only supposed to take a few years, has turned out to involve a great transformation that will require a generation or more. The development of the euro, which was supposed to represent the crowning achievement of European integration and compete with the dollar as a reserve currency, suggests the need to inquire about the heterogeneity of national regulations, as well as about the incomplete character and ongoing redefinition of European institutions and their relationship to the principle of subsidiarity. New information and communication technologies, which were expected to revolutionize corporate governance and to put an end to the business cycle thanks to the quality of

their predictions, has instead led to over-accumulation and, at the end of 2000, to a recession whose extent remains unclear. This article argues that these developments are not the results of mere errors, but rather of a growing discrepancy between the hypotheses posited by theorists and those that are implied by the events of the past two decades.

Theories That Are Implicitly More Normative Than Positive

This first paradox suggests a second. Though the distance between the predictions offered by theory and observed events is considerable, and though a deepening division of labor means that theoreticians communicate relatively little with applied economists, it is nonetheless important to offer an interpretation. Since he is not a physician of society, the economist tends to argue that the discrepancy between his theory and empirical observations is the result of a temporary gap between the coordination procedures advanced by “THE” theory (or more precisely his theory) and empirical observations, a gap which should gradually diminish. As a result, whether consciously or not, the economist tends at times to take on the role of minister, preaching the coming of a society dominated by a purely market logic (Marglin, 1999). His success thus derives, not from the accuracy of his analyses, but from his ability to convince governments to adopt reforms that would make their economies conform to the commandments of his theory. The value of theory, therefore, rests not so much on its analytical strengths or its contribution to our comprehension of the phenomena that constitute the central questions of our society, but rather on its normative values: political transparency, fiscal neutrality *vis-à-vis* individual choices, and economic equilibria as prevailing norms for ethical decisions. Could it be that the neoclassical economist is stepping into the shoes of his Marxist-Leninist predecessor by claiming to change the world...even before he has understood it?!

That question posed, one can use these observations to reach more positive conclusions about the chances for a revitalization of research agendas, through which we can rediscover the traditions of political economy from its founding fathers. Four principles could serve to guide this research, which is as necessary as it is difficult.

Theories Are Born Locally and within a Historical Context

From the generality of its founding axioms, rational-choice theory creates the illusion of immediate access to a universally valid explanations. Despite these pretensions, we must recognize that the relevance of an explanation depends on the specificity of its adjoining hypotheses that give form to the expression of substantive rationality and determine its equilibrium. The quality of an explanation thus depends on the relevance of these hypotheses much more than on the general problematic, which *a priori* provides no falsifiable conclusion (Moser, 1990; Friedman, 1996). We must remember in this context that the theoretician derives these hypotheses from his surroundings through an often implicit process. We can even wonder if the process is not actually inverted, that is, if it is not the stylized “facts” themselves that are fundamental and if their creation from rational decisions is not actually a second-order phenomenon.

With these questions in mind, it is clear that theories are born locally and within a particular historical context. They must prove their general applicability by an explicit process of long-run historical studies and international comparisons. The diversity of social connections and economic relationships is so great in space and time (Elias, 1974) that it is rather utopian, at least without further reflection, to claim to have provided a general theory that is valid at all times and in all places. The project of social physiognomy, contemplated by economists at the end of the last century, has clearly failed. In our time, economists set objectives that are much more modest, and at any rate, they must clearly define the field of application of their theory and constantly

verify its degree of general applicability, rather than simply offering it as a universally valid postulate.

Theories Are the Daughters of History

Economics shares with the social sciences an analytical domain characterized by agents' plans and expectations and the transformations of economy and society resulting from interactions that are repeated across time and space. As an economic system, capitalism reinforces this historicity of the organizational forms assumed by social relationships and of what Marxism tends to call "productive forces" (Marx, 1867). We must recognize, however, that theory is immersed in the process of transformation of capitalist institutions, technological development, and changing systems of value. This principle of historicity seems to have been forgotten by many of Marx's heirs, who believed that they had discovered through their reading of *Capital* a complete theory of the evolution of a system all of whose laws have been explicated. It also is rather ironic that some neoclassical theorists claim to have updated conceptions of the workings of an economy governed by markets, the task of economic agents and possibly even political authorities being merely to acknowledge the logic and ineluctability of its laws (Buchanan, 1997). Like Marxists before them, many contemporary economists claim that history must necessarily be the expression of theory. In so doing, they forget that it is the inverse relationship that obtains: theory is the *daughter* of History. It is time that we reversed the Hegelian dialectic, of which certain economists seem to be the heirs, conscious or not, when they argue that everything that is rational must be real.

Four Seminal Hypotheses for a Research Agenda

The economist tends to claim universality for a theory that is embedded in a pure economy, that is, one that is detached from all connections with the social, the political, or the religious. Nonetheless, we must recognize that contemporary economies are still and always have been characterized by interweaving, diverse logics that cannot be reduced to the logic of a *homo-economicus* maximizing utility and wealth. *Homo-sociologicus* can search for recognition through the social nexus, while the political sphere is the arena of the accumulation of power...All of this noted, a truly general theory is obliged to admit the interdependence of the economic with the other spheres of society, all the more so since diverse social orders tend to differentiate themselves by entering into interdependences at once informational and material (Théret, 1992; 1999b).

Economic analysis has made a great deal of progress thanks to the combination of four general principles: individuals make their decisions based upon rational calculations of costs and benefits; they interact through price signals that emerge from market equilibria; they form expectations through a process of rational expectations; and finally and especially, economic mechanisms are embedded in a universe with static laws. This theoretical edifice, however, comes up against limits in the presence of epochal innovations, suggesting four alternate hypotheses (see Table 1 above). First, rationality is embedded in a context and is thus contingent upon a framework of institutions, incentives, value systems, and spheres of activity. Second, and more importantly, a complex network of institutions, organizations, conventions, and beliefs provides market economies with stability and viability (Granovetter, 2000). Third, in their efforts to break through to the future, agents do not limit themselves to the models of the professional economist, but rather form expectations largely free from rationality, a fact demonstrated by the recurrence of speculative bubbles in the financial markets that are supposedly favored arenas for rational economic behavior. Finally, far from demonstrating the reversibility of pure theory, economies show a significant dependence on the past, whether the corresponding hysteresis results from technological externalities, the magnitude of the fixed costs associated with

constructing and legitimizing institutions, or the wide variety of forms of politics. There is no doubt that theoretical constructions are by nature increasingly complex, but is this not the price to be paid for greater relevance?

Economics Always Has Been...and Always Will Be Political

Economics is born political and then, after a long period of development, tends to transform itself into economic analysis and then into economic theory. It bears noting, however, that the interdependencies of economics and politics are clearer than ever when one notes, for example, that national borders continue to exercise significant influence over economic relationships and behaviors (Helliwell, 1998). It is also increasingly evident, if one observes the separation between the curricula of business schools and those of economics departments, that the economist is above all the Prince's councilor. If he does not want to be manipulated in the development of political strategies, it is essential that he develop tools allowing him to understand the interrelationships between economics and politics. Paradoxically, rational-choice theory, so dear to the economist, has found a new field of application in this overlap (Friedman, 1995), to such an extent that it has given birth to new sub-discipline that calls itself "International Political Economy" (Drazen, 2000).

But this is far from the only conceivable research agenda, since the economist can search among the conclusions of political science for hypotheses allowing him to deal with the specificities of politics in order to investigate both the degree of compatibility between economics and politics and the dysfunctions of each (Théret, 1999b; Palombarini, 2001; Boyer, 2001b). Such an inquiry provides him with an opportunity to explore the conditions of the emergence and success, but also those of the decline, of epochal economic conceptions (Lordon, 1997; 2000). These questions clearly represent a vast research agenda, difficult yet essential, of which cognitive sciences (Walliser, 2000) and other social sciences should take possession.

Formalizing and Repeatedly Testing the Predictions of Theories

Due perhaps to the deepening division of labor among theorists, econometricians, statisticians, and architects of economic policy, connections are strained between the results of a purely deductive approach and one that in the past we would have called "inductive." Many agree that contemporary economists seek more often to validate their models than to refute or falsify them, tendencies that are consistent with the lessons of Karl Popper, which economists actually heed very rarely (Popper, 1959; 1991). For example, empirical tests have clearly refuted the idea of the constancy of returns to cumulative factors of production in both the United States (Julliard, 1995) and France (Monteils, 2000), even though this hypothesis is at the heart of theories of technological progress and endogenous growth. Nonetheless, this perspective continues to inspire a great deal of theoretical research, despite the fact that the relevance and accuracy of its basic hypotheses have been shown to be problematic (Amable, Boyer, Lordon, 1995).

There is no doubt that a better balance between modeling and observation, deduction and hypothetical abstraction, and the positing of axioms and their refutation would bring renewed relevance to contemporary research. Such an effort would also have the merit of making explicit the process of abstraction through which the theorist constructs his hypotheses, whose relative importance and strength he would then be able to specify. Furthermore, this agenda would permit the reconstruction of a certain unity within the economics discipline, which today is Balkanized less by methodological differences than by the multiplication of disciplines and sub-disciplines and the overly strict separation between theory and applied work within each.

If these propositions were discussed, criticized, and changed and the results of these discussions were put into practice, economists could hope simultaneously to achieve a higher degree of scientific rigor, a renewal of dynamism and vigor of the accumulation of knowledge, greater clarity regarding the reasons for replacing one theory by another, a greater degree of attractiveness for the profession of teaching economics, and finally, more credibility and legitimacy for the their role as both the Prince's councilor and a citizen of democratic society.

Who would not share such noble objectives?

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