



PIERO FERRI

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# Preface

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Si jeunesse savais,  
si vieillesse pouvais  
H. Balzac

This book is the result of a double effort. On the one hand, it tries to answer some of the questions, both analytical and methodological, that recent worldwide events have raised. On the other, it attempts to systematize the work I have been carrying out, alone or with collaborators, in the last decade or so and that focused on themes that were almost neglected in the so called ‘Great Moderation’ years.

The book, however, also reflects long-term influences. In fact, I had the particular privilege of writing a D. Phil. thesis at Oxford under the supervision of John Hicks, and of collaborating with Hyman Minsky from 1978 until his death. The former taught me the love of theoretical questions, the latter the passion for relevant issues. This book pays homage to their memory, while Balzac’s quotation expresses my present feelings.

My collaboration with Minsky, which partly overlapped with my job as Rector at the University of Bergamo (Italy), has led to joint papers and to institutional relationships between our departments. Ed Greenberg and Steve Fazzari (Washington University) and Anna Maria Variato (University of Bergamo) are the follow-up of that collaboration. Most results of the book are due to this lasting collaboration.

Part of this book was written while I was honorary research professor at Washington University. Its development has been discussed in various seminars held at different universities (Ancona, Bergamo, Bologna, Milan (Catholic), Pisa, Siena, Urbino and Washington University at St Louis) and at different conferences held by the Eastern, the Western and Southern Economic Association, the Atlantic Economic Association and the IEA.

Financial support from the University of Bergamo (Italy) is acknowledged. Precious collaboration on the bibliography is acknowledged from Stefania Varinelli. Finally, I wish to thank Malcolm Sawyer and some anonymous referees for stimulating suggestions in editing this book. Last but not least, I wish to thank Sylvia Potter and Elizabeth Clack for editorial assistance.

# Introduction

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## 1. NEW PROBLEMS AND OLD QUESTIONS

The present slump (2008–9) seems to be more severe than any of the past recessionary experiences that have occurred since World War II. The interaction between financial and real aspects on a world scale has certainly contributed to this result. Although it is difficult to assimilate these events to those characterizing the ‘Great Depression’, they seem to re-propose two questions that were on the agenda during those times:

- a. Does a fall in aggregate demand have a direct impact on the labor market that causes involuntary unemployment?
- b. Are there endogenous forces that lead to self-correction of any demand-induced unemployment?

A natural place to look for answers to these questions might be the so-called ‘new synthesis paradigm’, which, according to some authors, is unifying macroeconomics. Even though it must be conceded that convergence is far from being complete, it is however true that the presence of a common methodology is an achieved result. The sentiment of relief that always accompanies the unification of a discipline is, however, immediately challenged when one considers the answers to those two questions that did not occupy a special place in the research agenda in the years of the ‘Great Moderation’ when the new synthesis had been achieved. It follows that some methodological questions become inevitable.

The *leitmotiv* of this book is the dynamic working of an economic system, rooted in a monetary economy of production, that is not automatically self-correcting. The philosophy underlying this idea is that instability is the result of endogenous forces. Shocks can trigger instability but cannot explain its persistence.

Even though endogenous instability can have different causes and different mechanism of transmission, three points of view will be adopted in order to characterize the analysis. Firstly, the analysis will be focused on a ‘medium-run’ perspective, where the relationship between cycles and growth can be examined and where disequilibrium processes take place. Secondly,

a monetary economy of production will be considered where there is interdependence between real and monetary aspects. This assumption can deal with different instability episodes as special cases. Finally, the presence of uncertainty imposes the hypothesis of heterogeneity among the agents.

The analysis, while showing some features of the dynamic working of the whole system, will focus on some of the labor market macro aspects, such as unemployment, the Phillips curve and income shares. Even though this attention does not imply that the labor market is always necessarily at the center of the transmission mechanism, it is true that any economic system must be measured in terms of these units in order to be evaluated.

Many key words have been introduced. It is urgent, at this stage of the analysis, to reconsider them in greater depth.

## 2. THE MONETARY ECONOMY OF PRODUCTION

Even though it may appear pretentious to mimic the initial title of Keynes's *General Theory* (see Pasinetti, 2007), it is true that the present work is focused on the dynamic properties of a monetary economy of production from a medium-run perspective. The replacement of the original 'theory' with 'economy' implies that the emphasis on theories is accompanied by the study of evolving economic structures.

The interaction between monetary and real aspects is therefore at the root of the present analysis, which belongs to the Keynesian tradition. Although it is very articulated and far from unified, this paradigm is still capable of offering important guidelines for an understanding of economic events, especially extreme ones. In particular, the present analysis tries to deepen some of the contributions that Minsky (1975) made, following the same route.

The interaction between real and monetary aspects is a methodological tenet that is not just useful for characterizing the present analysis with respect to other theoretical paradigms; it can also help to give an understanding of the present evolution of the economy. Even though it might appear as a compromise, the point of view of the interaction is richer than monistic interpretations. To attribute fluctuations exclusively to real (as in real business cycle theories) or to monetary aspects (like those stressing the role of monetary policy) can really be too restrictive and misleading.

## 3. THE MEDIUM RUN

To reach this target, one has to address the existing literature, to explore possible new analytical techniques and to suggest different research

strategies. One of these is to use a medium-run perspective. The dichotomy short-long run period is very popular in economics; it serves different analytical and practical purposes and goes back to Marshall (see Hicks, 1989). Usually, macroeconomics is confined to the short run, following Keynes's original suggestion. Normally, in the short run, the dynamics are exogenous, while wages and prices are often assumed to be predetermined. In contrast, the long run is at the center of growth theory, where both prices and quantities adjust. In the middle, there is the medium run, which, according to Solow (2000), is almost never considered (see also Blanchard, 1997 and 2008).

The medium run is an interval of time necessary to study economic fluctuations in their full evolution. The term 'fluctuations' has been used instead of 'business cycle' in order to include those events, like the presence of bubbles of different kinds, that have characterized the dynamics of the economy in recent times and have famous historical precedents. These events have been almost entirely neglected by the business cycle literature, which has mainly focused on post Second World War stylized events and favored the impression that cycles were almost obsolete phenomena.

#### 4. SOME METHODOLOGICAL TENETS

In a medium-run analysis, it is unsatisfactory for dynamics to be driven only by exogenous forces. Some kind of endogenous explanation must be put forward. The short-run vibrations, such as labor hoarding, and the long-run forces, such as those represented by the role of institutions, continue to be neglected, but in between, there are phenomena that should be explained by the model.

Within this perspective, there are some methodological tenets that must be stressed. In fact, as Hicks (1965) taught some time ago, each dynamic has its own method. Those referring to the medium run have at least three methodological implications that are worth considering.

Firstly, markets are not necessarily in equilibrium, an assumption seldom questioned in the present state of macroeconomics. On the contrary, disequilibrium can be a lasting feature of markets. Within this disequilibrium process, agents can modify both prices and quantities. The process of disequilibrium can be very complex, owing to the interactions between the various agents and the different markets. It implies two main consequences. On the one hand, uncertainty may become a dominant feature, while on the other, the presence of some form of imperfect competition must be assumed.

The presence of imperfect competition, and this is the second

methodological tenet, has deeper implications than are usually conceded in the literature. Firms can not only change either prices or quantities; they also have to forecast the whole demand function. Furthermore, they can operate with different degrees of capacity utilization, while the absence of a free entry condition is compatible with the presence of different rates of profits. Only in the long run are these differences bound to disappear.

Finally, in the presence of uncertainty, it is unpalatable to assume the presence of rational expectations. Agents have limited information and they are boundedly rational. In such a perspective, a learning attitude is more in keeping with the interval of time chosen. This learning attitude contributes to strengthening the role of endogenous dynamics fed by the forces reflecting the fundamentals.

## 5. GROWTH CYCLES AND THE FINANCIAL INSTABILITY HYPOTHESIS

If one takes these methodological tenets into account and applies them to a monetary economy of production in a medium-run perspective, it then becomes possible to study growth cycles, or better, economic fluctuations, which do not necessarily repeat themselves regularly, because they may be hit by different kinds of instability. Even though these processes may be triggered by exogenous events, it is true that they are fundamentally endogenous phenomena. Financial instability is one of these.

This book reconsiders Minsky's (1982 and 1986) contribution to this topic. On one hand, it tries to go beyond what Minsky himself achieved, above all by referring to an analysis that is explicitly carried out in terms of dynamics. On the other, it does not enter into the financial 'black box' as deeply as Minsky did. In a sense, it belongs more to the financial Keynesianism tradition than to the proper financial instability world.

The financial instability hypothesis does not necessarily lead to a collapse of the system, but rather to a severe alteration of the growth process considered in a medium-run perspective. Different economic policy strategies must be put into action.

## 6. A REGIME-SWITCHING DEVICE

In order to generate dynamic processes, a regime-switching device will be considered. The origin of this method can be traced back to Hicks's (1950) work on ceilings and floors, reconsidered by Minsky (1959) as a device to restate new initial conditions. In the present work, it utilizes some modern

technical developments (see Ferri and Greenberg, 1989 and Tramontana, Gardini and Ferri, 2010).

The advantage of a regime-switching technique is to merge the presence of disequilibrium with the existence of multiple equilibria. In other words, in order to avoid the explosion of the system, dynamics must not be constrained to avoid any kind of endogenous acceleration, as happens in models based upon rational expectations, in order to respect the transversality condition. On the contrary, these accelerating processes might well happen and this property seems to be in keeping with most of the economic episodes of instability, be it financial or technological. However, this model, due to the presence of multiple equilibria, can just about avoid exploding through changing regimes, where new parameters, which reflect a change in behaviour, take over.

## 7. THREE PROCESSES OF INTERDEPENDENCE

This analysis is characterized by three processes of interdependence that are worth mentioning. The first is between monetary and real aspects, which is implicit in the definition of a monetary economy of production. This vision goes beyond the dichotomy of real business cycle (RBC) versus new Keynesian interpretation based upon the existence of frictions, that is, manifestations of a monetary economy in the presence of uncertainty. In this context, as stressed by Nasica (2000), it is the mere existence of money that is non-neutral and not just changes in its quantities.

The second process of interdependence refers to the link between aggregate demand and supply. Pasinetti has rightly stated (2007, p.15)

that one must distinguish between Keynes's 'point' of effective demand, which is explicitly defined as 'the point of the aggregate demand function, where it is intersected by the aggregate supply function' (General Theory, p.25) and the 'principle' of effective demand . . . which lies much deeper . . . In other words, the principle of effective demand belongs to those profound characteristics that mark the 'production' economic system.

However, this does not imply that supply forces do not play a role in the medium run, when Keynes's *ceteris paribus* does not hold.

Finally, there is a process of interdependence between fluctuations and growth. Even though there has been some econometric evidence of this process, the economic reasons have remained rather obscure. In the present work, we offer a partial explanation by means of the regime-switching device adopted. The longer the system remains in the low-growth regime, the more it stays away from its potential growth. It may well be



that historical long-run growth would be different from the potential growth obtainable if the system were constantly in its most favorable state. Since the switching may depend on the strength of aggregate demand, it turns out that the interaction between aggregate demand and supply also matters in this longer perspective.

## 8. LACK OF STRICT MICROFOUNDATIONS

The analysis in this book does not start from the microfoundations of equations. There are two reasons for this. Ljungqvist and Sargent (2004, p.XXVI) state: ‘The first is aesthetic and preempirical: models with micro foundations are by construction coherent and explicit’. The second is that ‘a model with micro foundations broadens the sources of empirical evidence that can be used to assign numerical values to the model’s parameters’ (ibidem).

Browning, Hansen and Heckman (2000) have made some criticisms of this second aspect. It remains the first to be considered. According to Ljungqvist and Sargent (2004) any other theory would be ‘ad hockery’, the worst insult in the scientific field.

We agree with Hahn and Solow (1995), who refuse to consider a strict microfoundation as a *sine qua non* in order to have sensible macroeconomic propositions. For these authors, ‘ad hoc’ simply means that the conclusions depend on a particular value of a parameter and not that the analysis lacks a microfoundation. It is true, however, that the lack of a microfoundation implies the existence of a Lucas critique. But this is a general problem for any kind of macroeconomics because an Archimedes’ lever does not exist.

It must be stressed that in a situation of uncertainty, where markets are not complete, some social norms become important in guiding the behavior of agents (see also Akerlof, 2007). These interactions help in understanding some of the non-neutralities that characterize macroeconomics and their dependence on the state of the environment, economic policy being one of the most important aspects.

## 9. SIMULATIONS

The complex nature of the system discussed in the book requires trade-off in the analysis. In order to obtain closed form formulations, the analysis must be both simplified and linearized; however, a more complex system capable of producing interesting stylized facts can only be simulated.

In general, the approach of this book has been to choose the second alternative. Even though the exact calibration of the various parameters is not part of the purpose of the present book, it is undoubtedly true that the values chosen for these parameters are very close to the ones observed in various economic experiences.

The purpose of these simulations is not only to reproduce the most important stylized facts, but also that of creating scenarios where new stylized facts can appear and where some exercises of stress testing can be carried out. The recent events have shown that these exercises can be very useful. In fact, in turbulent situations, the parameters of the equations can change dramatically and the lack of data prevents us from carrying out econometric exercises just when they are more needed.

## 10. SELF-ADJUSTMENT VERSUS POLICIES

These exercises are also important to illustrate the relevance of the debate on economic policy that characterizes the present state of the economy. Even though the results of the debate depend on many technicalities, it is undoubtedly true that the different stances depend very much on the stability of the system, a property seldom considered in economics.

Stability has a dynamic dimension that is fundamental to an understanding of the debate. It fundamentally implies two questions. Is the system stable? How long does it take to return to equilibrium? The simulation exercises in this book show how problematic the answers are to these questions. This leaves more potential room for policies, even though the success of their actual implementation depends on the art of politics.

## 11. THE ‘VISION’ OF THE BOOK

The main thesis of this book is that an effective way of dealing with the interaction between cycles and growth is through an explicit consideration of the interplay between demand and supply. In this perspective, the following points contribute to defining ‘the vision’ of the book:

- a. The analysis is based upon a Keynesian model of aggregate demand integrated with supply considerations.
- b. Furthermore, there is an endogenous link connecting income distribution, financial and institutional aspects, in keeping with Minsky’s analysis of financial instability (1975).
- c. It is based on a series of macro models that are not strictly

microfounded, but that are compatible with other justifications (see, for instance, Akerlof, 2007). In other words, Lucas's claim (1987) that 'the term "macroeconomic" will simply disappear from use and the modifier "micro" will become superfluous' (p.107) will be rejected.

- d. The analysis mainly refers to a medium-run rather than a long-run period, as is traditionally done, where the analysis usually emphasizes the steady state. In the medium-run context, it is possible to detect both periods of rapid expansion and of relative decline that are different from those stressed in the business cycle literature and that are ignored by growth models. Within this perspective, we prefer to talk about growth cycle models.
- e. These phenomena are compatible with the existence of multiple equilibria, where there is dynamic regime switching (see Ferri and Greenberg, 1992).
- f. In this uncertain environment, agents are boundedly rational and try to learn accordingly (see Grandmont, 1998 and Hommes and Sorger, 1998).
- g. The analysis is carried out by means of simulations. The results show a variety of dynamic patterns that are particularly rich and complex because the model is not constrained to be linear.
- h. Much emphasis will be put on labor market phenomena in order to synthesize the working of the various models.

## 12. THE STRUCTURE OF THE BOOK

The book is in five parts. Part I deals with background aspects such as the challenges of the facts, the presence of financial instability, the considerations of methodological aspects and the nature of a macro approach. Part II analyzes the importance of institutional aspects, such as imperfect competition and the consideration of the labor market, as essential aspects, in order to consider the implications of a monetary economy of production, along with the role of aggregate demand and its impact on unemployment. Part III, which insists on the interaction between aggregate demand and supply aspects, initiates the dynamic analysis by introducing a model à la Minsky and stressing not only instability but also those elements that underlie the existence of inflation and the presence of the Phillips curve. Part IV deals with growth cycles obtained by referring to regime switching. In this part, the role of the financial instability hypothesis, along with the pattern of income shares, will be considered in an economic policy perspective. Part V concludes.

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## PART I

### The background



# 1. Dynamics in the medium run

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## 1. SOME TRADITIONAL DICHOTOMIES

There seems to be a widespread consensus among the various schools of thought that economic analysis should be carried out in dynamics terms (see, for instance, Chiarella and Flaschel, 2000, Turnovsky, 2000 and Ljungquist and Sargent, 2004), even though, according to Hicks (1965), it is very difficult to obtain a theory of economic dynamics. ‘I do not think that there is such a theory; I much doubt if there can be’ (p. iii).

With respect to the past, mathematics has developed new tools (see Day, 1994 and Kuznetsov, 2004), while in the computer age it is possible to study complex dynamics by means of simulations that were unthinkable only a short time ago. In other words, the mathematical constraints to studying dynamics have been softened so that ‘new’ paradigms may compete with the old ones. One of the many barriers into the scientific arena has fallen, even though Hicks’s perplexities remain valid.

The constraint to use linear models has favored the diffusion of dynamic theories based upon exogenous explanations, where the presence of stochastic shocks acts as the engine for dynamics (see Frisch, 1933). In contrast, the possibility of referring to nonlinear systems may encourage the reconsideration of endogenous dynamics (see Velupillai, 2008) that were at the core both of the classical economists (see Vercelli, 1984), even though expressed in non-mathematical terms, and the early Keynesians (see Samuelson, 1939 and Hicks, 1950). Exogenous versus endogenous explanation is only one of the dichotomies that characterize dynamic approaches.

In fact, dynamics in economics has been studied under two separate headings: growth theory, which studies long-run phenomena, and the theory of business cycles, which, on the contrary, considers shorter frequencies. This dichotomy implies further analytical distinctions. While growth theory, both in the old and new versions, stresses supply-side forces (and this is true for both the new neo-classical school and the Schumpeterian approach), business cycle theories insist mainly on the role of aggregate demand and the presence of frictions in the working of the markets.



Of course these distinctions are too clear-cut. In fact, there are examples that also maintain both a real and supply-side approach for the short run. The real business cycle (RBC) is the most important example in this regard. More difficult, however, is to find the opposite situation, of an incursion of aggregate demand into long-run analyses (for an exception, see Aoki and Yoshikawa, 2007).

The main consequence underlying this division between cycles and growth is that the former tends to be considered as a temporary phenomenon that does not impact on the long-run forces of an economic system. This conclusion is probably the result of periods of tranquillity when the business cycle is not a relevant phenomenon. It is very hard for it to be accepted in other circumstances, such as the present one, when it is reasonable to assume the existence of deeper relationships.

## 2. A TRIPLE ANALYTICAL INTEGRATION

The necessity of integrating the analysis is largely overdue. And this is true from three perspectives. Firstly, one has to link business cycle models with growth theories. Secondly, aggregate demand aspects must be integrated with supply forces. Finally, financial aspects must be interrelated with real phenomena. These complex interrelationships between the various aspects are likely to strengthen the endogenous explanation of dynamics.

Although the integration of demand and supply was present at the beginning of formal growth theory (see Harrod, 1939), it has been largely absent in those growth models that followed (for these considerations, see also Dutt, 2006 and Palley, 1997). These models mainly paid attention to the supply side and focused upon a deterministic trend (see, for instance, Solow, 1956).

In contrast, the literature that relates to stochastic trends has dealt with the link between the short run and the long run. If a long-run time series of growth rates is considered, for example, the hypothesis of interdependence between short-run and long-run movements can reasonably be put forward, as is done by Prescott (1986). However, this integration is achieved at the cost of two limitations. On the one hand, it is based mainly upon statistical tools; on the other it is related to supply aspects. This one-sidedness runs the risk of leading to paradoxes or wrong conclusions. In fact, within this methodology, there is a tendency to attribute an acceleration of growth to technical change, while leaving decelerations largely unexplained, unless the possibility of negative technology shocks is admitted.

The advent of endogenous growth theory (Romer, 1986) has helped to