Banks and finance in modern macroeconomics*

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1 Introduction

It is generally recognized that, for large part of the 20th century, from the late 1930s to the 1980s, mainstream macroeconomics virtually expelled banks and the financial system from its theoretical representations of the economy (see, e.g., Gertler, 1988; Goodhart, 2005-2006). As a consequence of not incorporating banks and finance in the basic analytical structures of mainstream macroeconomics, the debt structure within the private sector was also cancelled, either by aggregating the private debts of heterogeneous agents, or by simply assuming that the macroeconomic behavior of the economy could be effectively represented by models with a single representative agent. It was only in the last 30 years or so that the macroeconomists' interest in credit and financial markets grew significantly. In the meantime, the financial system expanded enormously. Big banks trade in global markets, marketing innovative financial products; a whole shadow banking industry has emerged; firms' and families' budgets take advantage of getting credit from the global financial system, whose poor transparency in terms of capital requirements and indebtedness suddenly became so evident since 2007.

An explanation of such an evolution of macroeconomics could be that, during the period when banks and finance were ignored at the theoretical level, the financial side of market economies worked in a relatively smooth way and, thus, economists tended to concentrate on different issues and topics. Such an explanation, though containing some truth, is not fully satisfactory. The theoretical interest in the financial side of the economy and its interactions with the real economy cannot be simply related to the occurrence, or absence, of serious disturbances. Finance and credit always play a vital role in modern capitalism and they cannot be the concern of economic theory only at critical times.

There are, in our view, more general reasons why macroeconomics evolved in the way it did. We propose an explanation of all this which is essentially based on the analysis of the way in which banks and financial markets have been conceptualized in mainstream economics. In our reconstruction we consider the historical context in which macroeconomists elaborated their theories, the evolution of the research technologies which they

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used and, finally, the vision of the market economy that different scholars had in mind when looking for operational models to be assumed as reference standards. We focus on the evolution of core theories. We do not deal in any detail with economic history, changing economic policies, or the sociology of research in academic communities.

In doing so, we try to provide elements that can help answer some critical questions: do banks and finance really make a fundamental difference for our understanding of macroeconomic events, so that 'forgetting' them means missing crucial aspects of phenomena like fluctuations and growth, macroeconomic stability or macroeconomic policies? Can macroeconomists ignore banks and finance in their modeling and interpretative strategies with only a minor cost to bear? Should macroeconomists stick to models and theories deprived of any explicit reference to banking and finance, or even to money?

By calling for attention to these issues, we point to restore a view of financial markets and banks as primary actors in the functioning, or malfunctioning, of market economies, to capture a more realistic vision of the 'visible hands' at work, rather than the impersonal operation of 'invisible' and impersonal market forces. In monetary market economies, the entrepreneurial activities in banking and finance are among the visible hands. Financial networks may be exposed to major shocks and be severely disrupted, with the consequence of blocking growth or amplifying business fluctuations. Notwithstanding the recent developments mentioned above, macroeconomics has still a long way to go to reach a satisfactory account of the complexities of financial markets.

2 From the 19th century to the 1930s

In the 19th century, economists concerned with growth and fluctuations had repeatedly directed their attention to price adjustments and price instability, regulation of the money supply, banking policy and the stability or fragility of the financial system, waves of credit expansion or contraction, fluctuations of expectations and confidence in financial markets. Many evoked speculative bubbles due to imitative expectations followed by disappointed expectations of capital gains, the domino effect of bankruptcies and the consequent out-of-equilibrium processes of adjustment.

Although from differing perspectives, those economists analyzed how in monetary economies, after some real or monetary shock, out-of-equilibrium adjustment processes occur. They dealt with the observable phenomenon of monetary illusion, due to either mistaken expectations about future prices or to the misalignment of monetary variables in the dynamic process that leads, eventually, to the adjustment to long-term equilibrium values. In these accounts banks and their financing of speculative investment has a prominent explicatory role. The so-called overtrading interpretation of financial crises was connected to the 'cycle of credit' that fueled immoderate speculation and accelerated the financial collapse, because of credit crunches, crises of confidence and the panic rush to liquidity following the bubble burst. Bankruptcies and their domino effect were an essential aspect of the picture of instability, both for their influence on expectations and the consequent impact on spending and production.

During the 19th century, however, economic thought suffered a kind of schizophrenia: while monetary instability played a prominent role in the explanation of historical events, classical or marginalist price theory put equilibrium values at its core. Economic theory focused on barter economies, in which relative prices are transparently set. In classical political economy, price theory was centered on the idea of a smooth adjustment to long-term equilibrium values, established independently of the supply of money, finance and the banking system. The schizophrenia became even more evident with the emergence of models of rational, maximizing behavior within the new equilibrium paradigm that various economists explored in campaigning for a science of political economy grounded on rigorous mathematical language.

At the turn of the 19th century, the gulf between monetary theory and relative price theory was evident to those actively involved in building models of competitive market equilibrium. The equilibrium analysis of consumers' and producers' optimal choices was disconnected from the study of business fluctuations and the monetary economy. Jevons and Walras faced the problem by suggesting that it was the inevitable consequence of developing the economic science in a two-stage process. Statics, concerned with the equilibrium theory of relative prices in a barter economy, is the scientific foundation on which, later on, the dynamics of business cycles has to be built (Ingrao, 2013, pp. 575-ff.).

Since the late 19th century, there was some uneasiness with such promises of future solutions. Wicksell saw the issue as a major topic. In *Interest and Prices* (1898[1936]) he pointed to the dichotomy between equilibrium exchange values and the absolute level of prices. Marshall tried to bridge the gulf between the foundations of economics, dealt with in his *Principles of Economics* (1890[1997]), and monetary theory by devoting a late separate volume to money and credit (*Money, Credit and Commerce,* 1923). In the various editions of *Éléments d'Économie Politique Pure ou Théorie de la Richesse Sociale*, Walras tried to include a technology of monetary payments within his equilibrium construction of pure political economy by justifying a demand for cash.[1]

The uneasiness with the gap between static equilibrium theory, and monetary theory, the theory of the trade cycle or economic dynamics in general, came to full light in the early 20th century. The issue was addressed either from the perspective of how the quantity theory of money could be embodied into equilibrium theory or from the complementary perspective of how to reconcile the static price theory with the explanation of dynamic phenomena occurring in monetary economies. Both perspectives shared the preoccupation about the role of banks in the process of expansion, or contraction, of the money supply through bank lending. A number of scholars (among whom Wicksell, Fisher, Robertson, and Schumpeter) insisted on the role of private banks in creating money if not without limits, certainly within the flexible limits set by highly elastic constraints. The banks' ability to create money was an object of concern.

[1]Bridel (1997) carefully scrutinizes Walras's attempts to put money into his general equilibrium construction; he concludes that they failed. Baranzini (2005) addresses the controversial relation of Walras's monetary theory in pure economics and in applied economics. Walras paid much attention to monetary questions in his writings on applied political economy, but the coherence of these with the his pure theoretical construction is also the object of ongoing controversy.

By the mid-1920s, both for historical reasons (the postwar instability) and for the inner logic of development of the equilibrium paradigm, the reconciliation of competitive market equilibrium and business cycles in a monetary economy became a major theoretical issue. During the turbulent years following the first World War, in the early 1920s, or later during the contagion of the international financial crisis and the spreading of the depression, a variety of analyses emerged that focused on banks and financial markets in the macroeconomic scene, notably by Hawtrey (1919), Robertson (1926[1949]), Fisher (1922, 1932, 1933), Hayek (1933, 1939), Keynes (1931[1972]b, 1931[1972]a.) Hayek (1933) held that the aim to unify coherently equilibrium price theory and dynamics was the task of his generation, since till then little advance had been done to bridge the gulf. From a different perspective, Keynes complained that the neoclassical theory was a theory of a barter economy, and that this prejudiced the understanding of unemployment (Keynes, 1933[1973]). Myrdal wrote *Monetary equilibrium* (1939) with the objective to go beyond Wicksell and reduce the gap between monetary and equilibrium theory. Hicks had in mind the same purpose in writing *Value and capital* (1939[1965]).

Since the 19th century, there was a wide debate on the question whether disturbances to full employment and market equilibrium arise from real or monetary disturbances. From Thornton to Ricardo, from J.S. Mill to Marx, from Jevons to Wicksell and Marshall, either the primary role that real forces play or the primary role of monetary disturbances, or some combination of both, were taken into consideration. Jevons, who introduced the study of business cycles based on the statistical analysis of time series in the mid-19th century, viewed business cycles as caused by shocks to agricultural crops due to the periodicity of solar spots. Jevons was a real business cycle theorist *ante litteram*, but he never severed the analysis of real business cycles from monetary phenomena, and he explored how the shocks to agricultural crops finally affected British manufacturing markets, affecting expectations in the business world and credit markets. Also other authors who emphasized the importance of real factors, examined the transmission mechanisms via the links with the financial sector to explain fluctuations in prices, income and employment.

Although in different theoretical contexts, the connection between the real and financial sectors was established by considering the expansion or contraction of credit, fluctuations in nominal interest rates, divergences between the market rate of interest and the real rate of return on investment, the delay of monetary wages to adjust to inflation or deflation, liquidity crises of banks, the systemic bankruptcies of improvident investors, and so on. The Austrian school underlined how the divergence between the banking rate of interest and the real rate of return on investment put into motion a train of events that involved both real investment and monetary phenomena. Schumpeter, a proponent of real business cycles due to innovative change, however connected investment to bank credit. Whether the ultimate cause was seen as real or monetary, or a mixture of both, there was the shared conviction that working of the system of payments, the credit structure, the degree of risk in the balance sheets of households or firms, the solidity of banks and financial institutions, affect the way in which market economies react to shocks.

3 The Keynesian paradigm, Monetarism and beyond

In the controversial climate of the debates recalled above, macroeconomic theory eventually emerged as a distinct field of research with the Keynesian paradigm coming to dominance. Unfortunately, under the dominance of Keynesianism from the late 1940s to the early 1970s, banks, financial intermediaries and financial markets faded away from macroeconomic models. Commercial banks came to play a merely passive role. Attention was focused on central banks, which were assumed to be able to implement effective policies to control the money supply and stabilize the economy.

All this might appear paradoxical, given the emphasis that Keynes, in the 1920s and 1930s, had laid on the banking system and finance. In reality, Keynes himself in *The General Theory* expunged banks from his analysis of the functioning of the economy; a choice that can be explained by his wish to stress the importance, in a uncertain world, of liquidity preference expressed as demand for (idle) money–something that cannot be easily done if the existence of banks makes the supply of money endogenous–and his adoption of an equilibrium method, as opposed to the more dynamic method of his earlier major work, *A Treatise on Money*.

As a consequence of Keynes's choice, the postwar Keynesians, who built the theoretical scaffolding of the so-called 'Neoclassical Synthesis', developed macroeconomic models in which the financial side of the economy is collapsed into the equilibrium equation between the demand and supply of money and the money stock is an exogenous policy variable under the assumption of a stable money multiplier.[2]

The Keynesian dominance came to its end after the radical criticisms by Friedman and others which promoted the so-called monetarist counter-revolution. Friedman criticized Keynesians for having 'forgotten' money; but the new monetarist focus on the money stock did not lead to a renewed attention to the financial system as a whole. Friedman pointed to the primary role of erratic monetary shocks affecting the stability of nominal income, under the assumption that the central bank could easily control the appropriate money aggregates, and promote long-term price stability.

Monetarism was followed by New Classical Macroeconomics (NCM), and inside money and finance were give even a less significant role to play. The concern about monetary aspects was essentially confined to considering the effects of 'monetary surprises' caused by unanticipated changes in the money stock controlled by the central bank (Lucas, 1972, 1981). The explicit choice to conceive of the macro-economy as a system of markets in full equilibrium, the equilibrium path being disturbed only by the transitory misconceptions of relative prices due to monetary surprises, implied the a priori exclusion of financial markets as a source of disturbances to equilibrium.

Eventually money disappeared altogether in the new generation of real business cycle models (RBC). Monetarism eventually turned into 'Monetarism without money' (Laidler, 2015, p. 19). Real business cycles models shifted their focus from monetary to

[2]The well-known Modigliani-Miller theorem (Modigliani and Miller, 1958) contributed to such an evolution of macroeconomic analysis, as it states that, under the hypothesis of perfect markets, the value of a firm is unaffected by how that firm is financed.

technological shocks. Money, let alone financial markets, disappeared from the theory of business cycles, which were reduced to optimal responses to real shocks by an isolated representative agent. In one-agent economies financial intermediation is redundant.

In due course, the ability of RBC models to explain the real world was challenged by the emergence of New Keynesian Economics (NKE), which emphasizes the importance of market imperfections for the explanation of the working of the economy and how it reacts to real or monetary shocks. The conflict among NCM, RBC and NKE in the late 1980s eventually ended about thirty years later with the convergence of mainstream macroeconomists on a number of topics and issues, which has been called the 'New Neoclassical Synthesis' (Goodfriend and King, 1997). The key features of the new synthesis are: i) macroeconomics has to be based on rigorous inter-temporal general-equilibrium foundations; ii) the agents' expectations are rational; iii) there exist imperfections and frictions that are relevant for the working of the economy and they make policies (especially monetary policy) effective; iv) the most advanced analytical tools are dynamic stochastic general equilibrium (DSGE) models.

Initially, the theoretical and analytical focus was on imperfections in the goods and labour markets. Over the years, and especially after the 2007-2008 financial crisis, macroeconomists have produced a growing number of works concerned with credit and financial markets, whose existence is essentially justified and based on informational imperfections. Though these efforts to develop the analysis of how credit and finance affect and interact with the real economy certainly are worthy of appreciation, we believe that they still are largely insufficient to provide a satisfactory understanding of the problems at hand.

In our view, these attempts are, so to speak, 'trapped' in a general theoretical framework, inherited from the past, which prevents macroeconomics from realizing a more satisfactory understanding of the way in which credit and finance affect the working of the macro-economy. Such a theoretical framework is the general equilibrium model and the way in which it has been embodied into macroeconomics since the 1950's. We deal with this issue in the next section.

Before turning to consider the above-mentioned issue, it is important to take into consideration the problem of how the nature of banks has been seen. Until about the 1930s, the predominant position concerning the nature of banks had been that their ability to create money through credit was essentially independent of the amount of their deposits and reserves. Wicksell and Schumpeter, for example, had both such a view of banks, which necessarily implies that they are not mere intermediaries between savers and borrowers. For the Keynesians of the Neoclassical Synthesis, banks were still able to create additional money through credit but in a passive way. The quantity of money in circulation was conceived as essentially determined by the central bank. In fact, it was assumed very often that the quantity of money created by commercial banks was a fixed multiple of the hard money issued by the central bank (the money multiplier). In the 1960s, the prevailing view of banks underwent a further significant change: they came to be regarded as institutions that are not essentially different from any other financial intermediary (Tobin, 1963).

The monetarist counter-revolution did not bring about any significant change in the conceptualization of the banking system, if not for signaling the systemic risk of banks' runs intrinsic to a less that 100% reserve banking system.[3] If banks are passive intermediaries, or if specific legislation constrains them to be passive intermediaries, it is reasonable to abstract from their role, when analyzing the macro-economy. Taking banks into account appears to be only a complication to avoid without any relevant theoretical consequence, especially at the textbook level.

In macroeconomics it is well known that in a decentralized market society financial markets promote the agents' inter-temporal coordination of spending and saving, but it is not so often recognized that banks are strategic actors. Far from being passive, their role as intermediaries between lenders and borrowers is linked with their role as competing innovators. They competitively create the money contracts which they sell, tailoring them to the clients, anticipating the emerging needs on the demand and the supply side. A mechanical interpretation of the money multiplier overlooks that banks generate financial innovation that is a major engine promoting growth, or it may be a major factor of fragility and instability.

4 Banks, finance and general equilibrium: the second half of the 20th century to today

Already in the late 1930s and 1940s, in debates on Keynes's theory, several had claimed that a proper macroeconomic analysis must be carried out by taking into due account all the interrelations among variables and not by isolating some of them as Keynes was accused to have done.[4] In the following years, the generic recall to the necessity to adopt a general equilibrium approach to macroeconomic analysis transformed into explicit attempts to set macroeconomics in a proper Walrasian context. In this respect, Lange (1944) and Patinkin (1956) were of great relevance. These attempts, however, clashed with the difficulties inherent to Walrasian general equilibrium when trying to deal with money, let alone banks and finance.

The image of competitive markets had developed dichotomously. An equilibrium system of competitive markets turned out to be logically split into the set of equations setting relative prices in goods and services markets, where neither money nor financial intermediation play any role, and the added quantity theory equation needed to set the general price level, and eventually anchor the system to monetary values. If the quantity theory equation apparently does the trick to integrate monetary values into the pure price theory, the two complementary sets of equations are deeply disconnected with regard to their analytical foundations.

Notwithstanding the efforts that the best minds in economics had devoted to the task in the years of high theory from the 1920s, the thorny question was still open in the

[3] The crucial role of central banks and the passive role of commercial banks were theorized by Friedman, who campaigned to impose 100% reserve requirements for deposit banking.

[4] This was a relevant issue in the debates on the theory of interest rates and the wealth effect. See Ingrao and Sardoni (2019, pp. 114-138).

1960s. Arrow (1967, pp. 734-735) noted that the failed relation between macroeconomics and microeconomics was a scandal in price theory. Arrow's scandal was so much of a challenge that it was worthwhile to point to it almost fifty years later. The 'Arrow challenge', as Sargent called it in 2015 was still relevant for macroeconomics at the opening of the 21st century. It was exceedingly difficult to explain why money should be there, or how it could be put there following a stringent line of research.

Lucas (2013, pp. xxvi-xxvii) acknowledged that in contemporary mainstream macroeconomics, money is not there. Not only it is not there; it is a puzzle, and a difficult one to solve. The difficulty, or more precisely the theoretical impossibility, to include money in neo-Walrasian models is acknowledged by a large specialized literature.[5] As Sargent (2015, p. 47) noted, in the neo-Walrasian world money as cash makes no sense, since there are no bilateral exchanges, and thus no need of a generally accepted medium of exchange. In the multi-lateral system of complete spot and forward markets there is no need for money as a means of payment. The system of payments is mimicked as if it were a perfectly centralized, coordinated system of mutual credits, none of which is at risk of insolvency or default. The fictional auctioneer, calling equilibrium spot and forward prices at infinite speed of adjustment, guarantees that no agent defaults, or fails to accomplish what is stated in contracts. The rationality assumption guarantees that each planned budget is balanced over the relevant horizon.

In the fictional Arrow-Debreu markets there is no need for money to transfer general purchasing power from the present to the future, as the liquidity component of portfolios. Every good is perfectly liquid at the prevailing equilibrium price if general equilibrium is instantaneously achieved. If risks arise, they are fully covered by contingent forward exchanges, according to the states of the world. In perfectly competitive markets, each and every bond or share, if any are conceivable in these fictional markets, would be perfectly transparent in terms of expected risk and returns to all traders.

In the Arrow-Debreu world there is no need for money even as a unit of account, since every single good or basket of goods may be chosen as numeraire. The absence of money implies *a fortiori* the absence of finance and credit, apart for the spurious multilateral credit system of neo-Walrasian markets mentioned above. Theoretically, it is conceivable that some intermediaries might supply credit to their debtors in kind. In actual economies, however, money is not only used as a means of exchange but it also plays an even more important role as unit of account. The need for money as a unit of account is related to the convenience of the standardization of computations, to facilitate communication among communities of traders, the collection of taxes or other payments, the setting of price in various locations. If a Walrasian model can, at the most, allow for lending and borrowing in kind, the distinctive feature of a modern credit system is the supply of purchasing power that is not constrained in terms of the goods to be acquired with it. There are restrictions to the transactions approved for each credit line or instrument, or open to each specific borrower, but the nature of credit is

[5]Debreu explicitly recognized that money is absent from his *Theory of Value* (Debreu, 1959). Hahn repeatedly discussed the issue and convincingly argued that money has no place in the Arrow-Debreu model (see, e.g., Hahn, 1965, 1982, 1987).

to supply general purchasing power that borrowers will be free to use according to their best knowledge of their specific circumstances and purposes. Credit and finance are intrinsically linked to monetary values, and embedded into a monetary economy using a medium which is representative of general purchasing power.

Moreover, since the 1970s, the research technology most widely adopted in mainstream macroeconomics refrained from going through explicit aggregation procedures. These were bypassed by making the assumption of a strict equivalence between the macroeconomic behavior of the economy and the behavior of an ideal, representative household. The research technology based on the representative agent postulates the irrelevance of heterogeneous agents for the dynamics of the economy.[6]

It is easy to see that the single household assumption erases a priori heterogeneous borrowers and lenders from the macro economy, including the constellation of diverse banks and financial bodies. The rational, single household optimally adjusting intertemporal choices cannot enter into borrowing and lending with itself; it cannot be exposed to any risk of illiquidity or insolvency; it runs no risk of not complying with its own optimal choices, or not knowing its own patrimonial solidity. The single household moves along its optimal path whatever the exogenous shocks that might hit it. The choice of this research technology was justified by the aim to demonstrate theorems within the sophisticated but still tractable macroeconomic models that it permitted to build.

5 Why should banks and finance come back to macroeconomics?

Since the 18th century, market economies work within the framework of a fully developed monetary system; financial institutions form an articulated system of markets and play a crucial role. The monetary system and the network of financial markets have undergone significant changes in terms of their extension and pervasiveness, and in terms of variety of organization, radical innovation in contracts, technologies of transactions, working practices and public regulations. From the first industrial revolution to the present, the smooth functioning or the maladjustment and crises of market economies have gone hand in hand with radical changes in the financial system.

Banks and specialized firms in financial markets act as Schumpeterian entrepreneurs by introducing radical innovations. They open the way to the diffusion of new means of payments, new credit and insurance contracts, new ways of funding investment and innovations, new ways of hedging. Such innovations create opportunities to enhance

[6] In the last quarter of the 20th century a large part of theoretical macroeconomics was based on Ramsey's optimal saving model and the Solow-Swan aggregate growth model, more than on neo-Walrasian general equilibrium models with heterogeneous agents and goods. All the radical issues concerning the poor results to be reached within the original Arrow-Debreu model which the literature on general equilibrium had raised since the late 1970s were bypassed. Research on aggregation demonstrates that no one-to-one mapping may be established between a properly general equilibrium economy and a single agent's economy, unless very strong restrictions are introduced (Kirman, 1992, 2006; Hendry and Muelbauer, 2018).

coordination, but they also enhance the risks of systemic collapse, being deeply ingrained into the management of the consumers' and non-financial firms' balance-sheets. Notwithstanding the recurrent cases of malignant speculation in financial markets, nobody could conceive the development of contemporary market economies all over the world separately from the intertwined development of payment systems, credit contracts, mortgages, insurance policies, hedging funds and so on.

In the light of the historical experience of capitalist economies, the need for embodying banks and finance into theoretical reasoning and modeling is obvious. The issue, however, requires more elaborated theoretical consideration. The starting point is evident: there is no auctioneer who makes the complex system of markets work smoothly. There is no a priori, inter-temporal coordination of people's decisions in market transactions; no central authority might collect the appropriate information, and impose whatever optimal allocation in real time. The working of markets depends on a set of norms, social practices, and institutions to regulate the production and allocation of resources in decentralized, bilateral transactions taking place in societies undergoing continuous innovation and change. Markets include systems of partial coordination, which require trained staff operating within the constraints of law, norms and shared conventions. Markets work, more or less effectively, thanks to visible persons, visible logistics and communication systems, visible monetary arrangements and financial contracts.

Systems of law, social norms, or shared conventions are the foundations of the trust that allow private people or organizations to carry out bilateral exchanges. People trust and rely on visible conventions which are shared by the other agents too. Money is a social, shared, convention regarding the common standard of value, in which bilateral partners denominate their contracts. Money is the instrument by which millions of transactions are expressed in a 'common language'. The instruments traded in financial markets are present and future flows of purchasing power denominated in money.[7]

In the decentralized markets of contemporary societies no transparent information is fully available a priori, and no inter-temporal equilibrium prevails in complete, forward markets. No central authority covers the risks of each and every contingency over the whole planning horizon. Financial institutions, banks or other private or public agencies, are among the decentralized bodies which help the coordination of bilateral monetary transactions in a world of radical uncertainty and asymmetric information. They exist because information about creditworthiness and risk of default is asymmetric and costly. They exist because financial intermediation operates within regulations and customs that impose high transactions costs, due to the necessity to impose sanctions to protect traders in an environment of asymmetric information and radical uncertainty governing the future money value of the assets in people's portfolios.

Banks and other financial intermediaries work as 'visible hands' which allocate money flows to potential buyers, or sell investment products to potential savers, coordinating choices not only in financial markets, but at the junction of these with the markets for goods, services, or properties. They may succeed or fail as they bet on making

[7]These contracts might be backed up by some real goods, or anchored to some real goods, but not necessarily so. In any case, collaterals have to be priced in money values.

choices today that are compatible with uncertain future flows of income, pricing assets whose future prices are volatile, assessing risks, smoothing possibly emerging imbalances, providing for buffers, and so on.

Banks manage the system of payments. As accountants, banks monitor the solvency of traders, who pay through instruments such as credit cards or deposit transfers. The collapse or the malfunctioning of the system of payments has severe consequences in terms of higher transaction costs and loss of confidence; it implies the more or less extensive paralysis of transactions and, hence, of the market economy. As the historical experience shows, the collapse of the system of payments drastically reduces the opportunities for otherwise useful and welfare improving transactions.

Banks inject flows of purchasing power into the balance sheets of borrowers, who channel it into the real estate market, the stock exchange, the markets for consumer durables or investment goods, with differential effects on prices or production. Banks perform an allocative function by evaluating creditworthiness and risks of default. They provide the human capital required to assess each constrained buyer's capability of intertemporal substitution. Their role in asserting creditworthiness is crucial as regards potential borrowers who, because of the modest size of their business and wealth, cannot provide guarantees to potential lenders; banks assess their ability to incur debt today to be repaid with future income. Notably, they finance medium or small firms, which have no access to the stock exchange or alternative channels of finance. Under prudential practices, information gathering and public regulations, banks help rationed borrowers get their sustainable financing. If the perception of the systemic risk of default rises, the banks' prudential behavior excludes potential borrowers from access to expenditure, with effects of credit rationing, or credit crunches.

If the fictional hand of the auctioneer is removed from the macroeconomic picture, coordination failures evidently show up. Some firms or consumers may become insolvent, or go bankrupt. The relevance of single bankruptcies, and their spillovers into other balance sheets, with real effects on spending, are related to the complex structure of the financial system. The systemic spreading of insolvency among the heterogeneous firms acting in the economy depends on the existing buffer stocks in both the real and the financial sectors of the economy, which are linked to the financial structure with respect to the distribution of debts and financial wealth. Bankruptcies in the banking and financial industry create systemic effects in the macroeconomy.

The above are only a few aspects and features of modern sophisticated market economies, but they are sufficient to show how taking account of the financial sector and its interaction with the real sector should be a fundamental constituent part of any theory aiming to understand, and possibly improve, the world in which we live. To accomplish such a task requires to go beyond the analytical and methodological strictures that still characterize the current mainstream.

6 Some concluding considerations and suggestions

Our historical reconstruction of the evolution of macroeconomics is not a mere antiquarian exercise. Our objective is to draw attention to a number of critical problems raised by the way in which the discipline has evolved. In this sense, the insights from the history of economic ideas are relevant. In this perspective, a crucial issue is the 'troubled marriage' of macroeconomics with general equilibrium theory since Patinkin's early efforts in the 1950s. Till today the model of a perfectly competitive economy has been regarded as the benchmark for 'imperfect' models.[8]

The very notion of a perfectly-competitive benchmark raises questions. Is it still the Arrow-Debreu model of the late 1950s? Or should it be the later model of Brock and Mirman, which is not a general equilibrium model since it does not include heterogeneous agents and multiple goods? Why should a representative-agent model be considered equivalent to a general equilibrium one and how may it stage competition if its fictional agents do not compete with each other but are isolated hermits with no need to trade?

Any attempt to answer these questions should start from acknowledging that the Arrow-Debreu model is plagued by analytical and conceptual difficulties. It does not provide a unique solution and it cannot provide demonstrations of converging dynamics towards equilibrium. It cannot support the presence of money other than as a numeraire; it cannot include financial markets. On further inquiry it appears that the representative agent model is not equivalent to the multi-agents, multi-goods general equilibrium model, unless very restrictive assumptions are made.

An assessment of the current situation should then conclude that there is no satisfactory benchmark model of perfectly competitive markets, which may stand as the polar star. Imperfections and frictions cannot be added to the Arrow-Debreu model. It is a delicate castle of cards which immediately collapses on removing perfect information, farsighted rationality, the auctioneer, and so on. The Arrow-Debreu model is the result of a selection of assumptions to isolate its conceptual skeleton from any contamination, so that it cannot accept any sort of alterations. If one wants to go beyond conceptual coherence and address the problem of the credibility of images of perfect competition in relation to competition in the actual world, it must be acknowledged that the idea of perfect competition belongs to the sphere of normative rather than positive economics.[9]

More generally, it is the very notion of imperfection that is highly questionable. To state that something is 'imperfect', or it behaves imperfectly, implies that it differs, at least in some respect, from something else that is 'perfect', or it behaves perfectly. And then, it would be necessary to explain how the alleged perfect economy morphed to an imperfect one. How could, for example, small independent price-taker firms that react to market signals in a purely passive way become large market-maker firms, which behave strategically and 'make' the market? Or, how could the agents's perfect information become imperfect? If anything, the agents' degree of information should have

[8] Even Stiglitz (2018), though strongly polemical with the current mainstream, makes recourse to this benchmark.

[9] In Walras's theory, notably, it corresponds to the normative ideal of justice in trade as distinguished from the normative ideal of distributive justice.

increased rather than diminish. Competitive markets, in fact, were never perfect in an Arrow-Debreu sense. Even the more or less freely competitive markets, as they might be characterized for example by the existence of many independent agents, too small to influence prices or other variables, cannot be legitimately depicted as perfectly competitive markets at the theoretical level.

The way out of these difficulties is, in our opinion, to follow an alternative approach to the problem of competition. It is the line that can be traced back to Classical Political Economy, Marx, Schumpeter and Hayek.[10] In this tradition, free competition is not the static world of the neoclassical perfect competition; it is a dynamic environment in which firms operate strategically to maximize profits and gain market shares, first of all through all sorts of innovations. It is this dynamic environment that eventually produces large firms that directly affect prices and control markets; firms themselves create 'imperfections' and 'differentiations' to the purpose to gain a better market position and larger profits. 'Imperfections' are not the result of 'subtractions' from the perfectly competitive benchmark; they rather are the outcome of the competitive process itself.[11]

What is more relevant is that the competitive dynamic process is inherently related to the existence of banks, and possibly other financial institutions, which are themselves strategic firms operating to the purpose to maximize their profits. Credit, banks, and other forms of financial intermediation are an essential element for the working of the competitive engine. Banks, in particular, far from being mere intermediaries between savers and borrowers, are strategic agents which, through the creation of money, represent a crucial element of the process of change and growth as well as of the phases of crisis, when they may contribute to accelerate and worsen the negative dynamics of the economy.

Another radical question revolves around the vision of dynamics as a steady-state equilibrium at the exclusion, or marginalization, of out-of-equilibrium dynamic adjustment processes. The conceptual structure of dynamic models in contemporary macroeconomics has its technical roots in Frisch's formalization of the rocking chair idea. The use of models based on the equilibrium-plus-shocks dyad is only apparently methodological. Models are, so it seems, engineering devices to deal with simulations and statistical evidence; in fact, the dyad has become a hypostasis: a property attributed to the underlying structure of the economic processes in market economies on the basis of an almost metaphysical vision.

Also such difficulties can be faced and overcome by recognizing that the economic process is not an orderly and smooth process, episodically disturbed by unpredictable events, but a process taking place in an environment in which disequilibria, which exist and may persist, are the outcome of endogenous forces at work. Agents endogenously produce out-of-equilibrium phenomena in their market interaction. In this respect, var-

[10] See Sardoni (2011, pp. 132-137) for some considerations about the differences between the Marxian-Schumpeterian and the New Keynesian approaches to perfect and imperfect competition. See Ingrao (2013, pp. 509-511) for Hayek's idea of competition.

[11] On the grounds of this notion of the competitive process, for Schumpeter, the 'imperfect' case should be regarded as the general one and the perfectly competitive case as well as that of pure monopoly should be considered as limiting cases (Schumpeter, 1954[2006], pp. 938-951).

ious theoretical lines appear relevant: the Keynesian tradition, the Fisherian tradition and Schumpeter's emphasis on innovation and change.

Keynes's analysis and the line of approach represented by the work of Minsky explain the inherent instability of capitalist economies by recourse to the uncertain environment in which they operate. Agents cope with uncertainty through the adoption of conventions which however are fragile and doomed to break. The phases of 'optimism' create the conditions for subsequent phases of 'pessimism'. For example, excessive indebtedness due to a fall in the agents' risk aversion that leads to crises of liquidity or solvency. Fisher suggests to look at episodes of recession in their historical complexity. Schumpeter looks at business cycles within the sociological perspective of the long-term evolution of market economies.

We conclude by outlining a few issues and problems still open and in need of further developments. The first is the link between stocks and flows out of steady states and in dynamic change. Stock disequilibria affect the income flows. The perception of the volatile valuations of assets and debts in private wealth, or in the portfolios of financial intermediaries, affects consumption and investment choices, as much as it influences expectations and portfolio choices. The complex interactions of the value of stocks with flow dynamics cannot be erased under simplified aggregation assumptions or smooth equilibrium theorems.

As a second and related subject, the time frame of macroeconomic analysis should be thoroughly revisited. The conventional distinction between short and long period of Marshallian descent is inadequate. This distinction is as inadequate as the dyad steady-state plus shocks. The dynamic paths which involve money and finance together with real changes create phenomena of path dependency and hysteresis. Short-period disequilibria may turn into into low-growth traps affecting human and physical capital, the ability to innovate, institutional stability, international relations or trade specialization. When the economic 'ship' capsizes, there is no easy going back to a postulated steady state. In historical processes of change, the short and the long period are not so neatly distinguished.

As an additional reflection on the same set of issues, it has to be stressed the importance of taking into account the institutional aspects of monetary regimes and financial markets, with due attention to the institutional structure, the practices embedded in the way financial institutions work. Monetary and financial regimes belong to the political and institutional structure, on which opportunities of real growth depend. They should be of primary interest in macroeconomics. They should not be just portrayed in more or less fictional models but considered by looking at their networks and market structure, their strategies for innovation and their standards of behavior.

The last, but not least, crucial theme is the analysis of actual economic behavior versus micro-foundations constructed under the assumption of Olympian rationality. The alternative to the perfect rationality of far-sighted agents optimizing over infinite horizons is not irrationality *tout court*. It is the intelligent human response in an environment of radical uncertainty and limited information. Incomplete, asymmetric information, far from being a 'friction' to be added, is intrinsic to human knowledge and action. Incom-

plete information is the incubator of innovation through the operation of competition.

It is difficult to translate and embody historical change, the intricacies of human intelligent response and initiative, the formation of expectations in conditions of radical uncertainty, into analytical models. It is then necessary that the profession realizes that a more satisfactory analysis of the dynamics of the economy cannot be looked for only through models, as much sophisticated they may be. It requires a variety of intellectual tools and combined efforts to explore the complex reality at various and different levels. If it is true that, for example, it is arduous to elaborate a fully endogenous explanation of waves of optimism and pessimism, or the change over time of the 'animal spirits', this does not mean that it is impossible to provide acceptable and rigorous explanations of such waves by recourse to other instruments and taking advantage of historical, social and political knowledge.

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