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Signorino, Rodolfo

University of Palermo

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11. Economics in the mirror of the financial crisis*

Rodolfo Signorino

1 INTRODUCTION

Famously, for Hegel ([1820] 2001: 20) '[t]he owl of Minerva takes its flight only when the shades of night are gathering', that is, philosophical reflection on the world runs behind the unfolding of events and is possible only *post festum*. Now that the world economy seems to be on the road to recovery from the global crisis which started about three years ago, conditions are favourable to the emergence of a less involved reflection on its possible causes in order to draw some useful lessons for the future. Another interesting subject to investigate is the search for economists' responsibility in the current events. Why were economists unable to foresee the crisis? Did mainstream economics influence regulatory and control policies in financial markets so as to favour (or at least, not hinder) the onset of the crisis? Has the crisis shown that heterodox economics, particularly that of Keynesian inspiration, is endowed with a better explanatory power than orthodox economics? Thorough analysis of the causes of the crisis and well thought-out answers to the above questions are yet to emerge from the ongoing debate. The actual dimensions of the phenomenon under study, in fact, will probably induce many non-economists and economists alike to a second thought on what, till a little while ago, appeared as established notions. The former (non-economists) may well wish to change their mind about the widespread belief according to which accepted economic theory considers the removal of any obstacles to free markets as the *conditio sine qua non* for efficient resources allocation. The latter (economists) should, at least, reconsider their prescriptions on the subject of financial regulation, prescriptions that manifestly proved unable to prevent or mitigate the present financial turmoil:

[T]he trust in the ability of self-regulation of the financial markets belongs to political ideology, not to economic doctrine. Economists have been studying for thirty years the failures of financial markets, speculative bubbles, the information asymmetries that distort the incentives of managers and financial

institutions, and liquidity crises. The lessons to be drawn concern the correct formulation and the contents of financial regulation, not its necessity. Evidence of this is the fact that the crisis has overwhelmed above all the banks, the most controlled sector of all. (Tabellini, 2009, my translation)

The structure of the chapter is as follows. In section 2 I discuss some of the factors that may have played a role in causing the crisis and emphasize that supporters of different economic theories will assign different weights to each factor in their analyses. As a consequence, suggested economic policies are highly sensitive to the economic theory employed in evaluating the set of causes. In section 3 I seek to defend economists from the common charge that their inability to foresee the crisis is a clear sign of the lack of scientific status of their discipline. In my view, the main liability of mainstream economics lies elsewhere, in its excessive trust on the self-equilibrating mechanisms of free-market economies. Mainstream macro-economists may have been too hasty in dismissing the financial instability hypothesis proposed by Keynes and developed by Minsky. Section 4 briefly outlines Keynes and Minsky's contribution on this subject, while section 5 concludes. It hardly needs to be stressed that what follows is but a very tentative analysis to be duly developed in future works.

2 PROXIMATE AND REMOTE CAUSES OF THE PRESENT DISTRESS

The collapse of the US sub-prime mortgage loan market, starting in spring 2007, is generally acknowledged as the immediate cause of the present financial and economic crash, by far the worst experienced by free-market economies since World War II:

There is some consensus on the proximate causes of the crisis: (i) the US financial sector misallocated resources to real estate, financed through the issuance of exotic new financial instruments; (ii) a significant portion of these instruments found their way, directly or indirectly, into commercial and investment bank balance sheets; (iii) these investments were largely financed with short-term debt. (Diamond and Rajan 2009: 606)

While there is substantial agreement on the proximate causes, identification of the remote causes appears more complex. Without claiming to be exhaustive, a possible list of the latter should include:

1. the strong *laissez-faire* bias generated by the so-called Great Moderation;

2. growing interdependence of economies due to the liberalization in the international movements of financial capital;
3. the Fed easy-money policy in the early 2000s;
4. radical changes in the nature and *modus operandi* of the banking system caused by financial innovations;
5. the changes in the incentives structure of financial managers;
6. the dynamics of income distribution and household indebtedness in the US economy.

The Great Moderation

The period of steady growth (mild recessions and local financial crises aside) starting at the end of the turbulent 1970s is generally labelled as the Great Moderation. The drastic reduction in the macroeconomic instability recorded for almost three decades preceding this crisis is generally ascribed to a plurality of factors, including (i) the structural changes occurring in real economies that made them more resilient to shocks; (ii) a substantial improvement in the performance of monetary policy in many industrialized countries which succeeded in reducing the volatility of inflation and GDP; and (iii) good luck, in the sense that, in the period under consideration, shocks were less frequent and wide-ranging (Bernanke, 2004). The Great Moderation brought with it, as a kind of by-product, improved trust in the thaumaturgical virtues of free markets and, by the same token, increased distrust in regulation and control policies by public authorities.² Along the way, the complacency of economists has sharply increased. In particular, macroeconomists have felt (and have been perceived by the public) increasingly able to comprehend the intricate mechanisms of free-market economies and thus formulate the appropriate policy recommendations when needed.

Liberalization in the International Movements of Financial Capital

The progressive abolition of barriers to the international movement of financial capital has allowed an extension of the potential market for – mainly US-made – financial products, thus stimulating financial innovation. At the same time, the growing Asian countries and the oil-producing Arab countries, with their surplus of savings, were inclined to purchase new US financial products, perceived almost as risk-free as US Treasury Bonds but yielding a higher expected return. A period of low real interest rates (Bernanke, 2005) and a considerable increase in the degree of financial interdependence in the world economy has followed. This has both positive and negative consequences. On the one hand, the possibilities of

diversification and hence of risk management have become wider; on the other, low real interest rates favour the rise of speculative bubbles, and financial interdependence causes the potential for a domino effect (*simul stabunt simul cadent*):

Since the only way diversification of idiosyncratic risks can happen is by sharing these risks among many companies and individuals, better diversification also creates a multitude of counter-party relationships. Such interconnections make the economic system more robust against small shocks because new financial products successfully diversify a wide range of idiosyncratic risks and reduce business failures. *But they also make the economy more vulnerable to certain low-probability, tail events precisely because the interconnections that are an inevitable precipitate of the greater diversification create potential domino effects among financial institutions, companies and households.* In this light, perhaps we should not find it surprising that years of economic calm can be followed by tumultuous times and notable volatility. (Acemoglu, 2009: 1–2, emphasis added)

The actual bursting of the crisis has shown that the risk distribution curve was indeed much more fat-tailed than the majority of financial brokers were then inclined to think.

The Fed Easy-money Policy in the New Millennium

The first few years of the new millennium in the USA were characterized by low nominal interest rates, too low for some commentators:

The classic explanation of financial crises is that they are caused by excesses – frequently monetary excesses – which lead to a boom and an inevitable bust. This crisis was no different: A housing boom followed by a bust led to defaults, the implosion of mortgages and mortgage-related securities at financial institutions, and resulting financial turmoil. Monetary excesses were the main cause of the boom. The Fed held its target interest rate, especially in 2003–2005, well below known monetary guidelines that say what good policy should be based on historical experience. Keeping interest rates on the track that worked well in the past two decades, rather than keeping rates so low, would have prevented the boom and the bust. (Taylor, 2009a)³

Moreover, low interest rates usually induce firms to raise their debt-to-equity ratio (so-called *financial leverage*). The goal to maximize the return on equity together with the availability of cheap money encourages banks and firms to take on increasing risks. Thus, short-term indebtedness rose in order to increase the acquisition of long-term assets, while, at the same time, new and effective (from the point of view of banks and firms) procedures for managing such risks were developed:

With very low interest rates, the only way of making intermediation by the banks profitable was to get into more debt to buy financial assets, that is, to increase the financial leverage. But to do this, banks had to find a way to get rid of the risk involved in such assets, both because in some cases the regulators did not allow a certain financial leverage for the riskiest activities to be exceeded and because banks themselves did not want to hold too risky assets. (Perotti, 2009, my translation)

The Process of Financial Innovation

The way to dispose of such risky assets was provided by financial innovations, in particular by the process of securitization and the seemingly endless creation of financial derivatives. Such innovations involve a structural change in the nature and *modus operandi* of the credit system:

Mortgage loans are no longer granted [by banks] so as to maintain a relationship with the client throughout the life of the loan and hence assume the risk directly (in the finance jargon: *originate to hold*, to originate for holding until loan expiration). Rather, the loan is granted to be transferred as soon as possible to the widest possible set of investors (*originate to distribute*). This drastic change in bank strategy has had potentially positive effects, but it has also produced serious distortions. In particular, a breakdown in the relationship between bankers' risk and responsibility has ensued. Therefore, the criteria for credit-granting and risk-evaluation, which are the fundamental elements of a banker's duty, have been loosened. What is important [from the bankers' point of view] is no longer to grant loans that may be refunded at their expiration, but to maximize the volume of loans to be granted and hence the fees to be earned. (Onado, 2009: 12, my translation)

In other words, the 'prestige game' carried out by the new finance consists in converting the mortgage loan, a typical illiquid asset springing from an idiosyncratic relationship between a borrower and a lender, into an easily negotiable and thus highly liquid asset. Until the borrowers' insolvencies were circumscribed, the prestige game worked well:

Home mortgages, credit card debt, automobile loans, student loans and the like were all pooled, or grouped together, and assets were issued that were backed by the groups. These asset pools were structured in a way that both reduced the risk faced by the buyer of the 'asset-backed' securities, and allowed borrowers access to credit they otherwise would not have had. It sounds like everyone wins; a pure efficiency gain. This all looked great, until 2007 when it became apparent that the quality of some of the loans in the residential mortgage pools might not be what they should have been. (Cecchetti, 2008: 2)

Hence, banks and other actors in the credit system became guilty of what Keynes stigmatized as one of the most antisocial practices in the

financial world, the relentless search for the liquidity of one's own investments (see *infra* section 4).

The transformation in the *modus operandi* of the credit system (from the 'originate-to-hold' to the 'originate-to-distribute' model) brought with it a change in the structure of individual incentives and the rise of a considerable problem of information asymmetry among the various actors involved in the financial transaction:

The 'originate and distribute' model destroys information compared to the 'originate and hold' model. The information destruction occurs at the level of the originator of the assets that are to be securitized. Under the 'originate and hold' model the loan officer collecting the information on the creditworthiness of the would-be borrower is working for the Principal in the investing relationship (the originating bank or non-bank lending institution). Under the 'originate and distribute' model, the loan officer of the originating banks works for an institution (the originating bank) that is an Agent for the new Principal in the investing relationship (the SPV [Special Purpose Vehicle] that purchases the loans from the bank and issues securities against them). *With asymmetric information and costly monitoring, the agency relationship dilutes the incentive for information gathering at the origination stage. Reputation considerations will mitigate this problem, but will not eliminate it.* (Butler, 2007: 2–3, emphasis added)

Changes in the Incentives Structure of Financial Managers

As Keynes once wrote, quoting the old English proverb, you can lead a horse to water, but you can't make him drink. The availability of drinkable water is just one of the circumstances required so that the horse may drink; the other – essential – circumstance is that the horse is thirsty. Paraphrasing Keynes's dictum, it may be maintained that the Fed easy-money policy and the new financial products have led the horse of the financial brokers to water; but the latter has (abundantly) drunk because it had strong incentives to do so. This point has been analysed in great detail by Rajan (2005: 315 ff.). In short, his thesis is the following. Until the 1980s in the United States the coexistence of technological and legal elements caused the predominance in the financial sector of traditional operators (banks) and a strongly risk-averse credit policy. Bank managers earned a basically fixed remuneration with very few incentives to take risks. Conversely, the risk that a credit management perceived as imprudent by the public could shake the trust of depositors and provoke a bank-run was overrated. As almost always happens in all those sectors in which 'tranquility' is bought at the price of a drastic competition squeeze, choice alternatives were nearly non-existent while inefficiencies spread: '[B]ankers [were] extremely conservative. This served depositors well

since their capital was safe, while shareholders, who enjoyed a steady rent because of the limited competition, were also happy. Of course, depositors and borrowers had little choice, so the whole system was very inefficient.' (Rajan, 2005: 315)

Such a 'petrified forest' situation waned when new information technologies drastically reduced the costs of acquisition and elaboration of financial data and legislative deregulation opened up new opportunities for competition in the financial sector. The salient characteristics of this new scenario are: (i) the appearance in the financial sector of new, non-banking, operators; (ii) the disintermediation of the more traditional and standardized financial products (in the financial jargon, *plain vanilla*); and (iii) progressive specialization of banks in producing and marketing the more sophisticated and innovative financial products. Consequently, also the incentives structure of bank managers underwent a drastic change since the remuneration of the latter has always been more sensitive to the short-run performance of their portfolio choices. In particular, Rajan points out that the overall remuneration of a given financial manager increasingly depends on the differential between the rate of return of his/her portfolio and that of competitors' portfolios. This means that competition in the financial sector pushes financial managers (i) to take increasing risks, particularly those that may be more easily hidden or underscored in the periodic reports they are subject to (such as the tail risks quoted by Acemoglu, 2009); and (ii) to conform to the investment policy chosen by the majority of their colleagues/competitors. Such a herd behaviour strategy shields financial managers from any sanction for underperformance whatever the actual pay-off achieved by the ruling investment policy.⁴ Such behaviour is indeed rational from an individual point of view but produces, at the aggregate level, some systemic results which are not necessarily benign:

Taken together, these trends suggest that even though there are far more participants today able to absorb risk, the financial risks that are being created by the system are indeed greater. And even though there should theoretically be a diversity of opinion and actions by participants, and a greater capacity to absorb the risk, *competition and compensation may induce more correlation in behavior than desirable*. While it is hard to be categorical about anything as complex as the modern financial system, it is possible these developments may create more financial-sector-induced procyclicality than the past. *They also may create a greater (albeit still small) probability of a catastrophic meltdown*. (Rajan, 2005: 318, emphasis added)

Unfortunately, recent experience shows that it is precisely the worst scenario foreseen by Rajan that has actually come true.

Dynamics of Income Distribution

Finally, according to some ‘heterodox’ commentators, a basic role in the present crisis has been played by the dynamics of income distribution in the United States (Barba and Pivetti, 2009).⁵ To put it in a nutshell, the gist of this line of reasoning is the following. Assume that, in a given economy, wealthy people have a decidedly smaller (marginal and average) propensity to consume than the poor. Therefore, in such an economy, an increase in the inequality of income distribution goes hand in hand with an increase in aggregate saving, that is, a reduction in aggregate consumption expenditure. The Keynesian evil of low aggregate demand, unable to foster full employment, comes true, unless the other components of aggregate demand (firms’ investment expenditure, government expenditure and a surplus in the balance of international trade) act as a substitute for languishing household expenditure. The US economy in recent decades has witnessed an apparent paradox: the coexistence of stagnant labour income and rising consumption expenditure (together with rising inequality in income distribution). Such a paradox was made possible, according to the heterodox point of view, by a deliberate policy of easy credit by banks and other financial institutions that allowed increasing household indebtedness, and by the Fed low interest rate policy that provided the necessary fuel for various speculative bubbles in the real estate and financial markets. Rising market prices of property and financial assets have boosted household financial wealth. Households have generally replaced wage income with debt as the main source for financing consumption expenditure and have used financial capital gains as collateral to back a growing indebtedness. In short, many US households have got used to considering their (mortgaged) houses as an automatic cash dispenser. Also the Nobel laureate Joseph Stiglitz acknowledges that a heavy recourse to debt can only delay, but not resolve, the inherent contradiction between increasing relative impoverishment of working classes and increasing consumption expenditure:

Growing inequality too has contributed to the lack of aggregate demand. We have redistributed income from those who would spend it to those that don’t. For a while, we thought we could circumvent the problem by allowing Americans at the bottom and middle to continue spending anyway, by borrowing. But that was not sustainable. (Stiglitz, 2009: 285)

To conclude this section, it may be claimed that a host of US domestic factors and international factors have played a role in the present global financial turmoil. Careful evaluation of the right weight to assign to each of these factors will help devise future intervention policies. Of course,

the results of this evaluation will heavily depend on the kind of economic theory employed.⁶ Mainstream macroeconomists will likely side with Taylor (2009a and 2009b) and, accordingly, demand a tighter monetary policy to prevent future bubbles. New microeconomists will be likely to focus on the asymmetric information and moral hazard problems in financial markets highlighted by Buitert (2007) and Rajan (2005) and, accordingly, demand a drastic change in the incentives structure of financial managers. Finally, heterodox economists will probably argue that governments' most urgent task is the introduction of a set of fiscal and social security measures to achieve considerable income redistribution to the benefit of middle/low classes, while a restrictive monetary policy and/or new and more severe regulations of the financial markets may prove to be ill-advised decisions since such measures would depress the consumption capacity of poor families, typically those more credit-constrained.⁷

From the economists' perspective the basic question to be answered is: has the current crisis shown the urgency of a thorough review of the main pillars of accepted economic theory or, on the contrary, only an upgrade of its analysis of financial markets? What is thus at stake is the explanatory power of mainstream economics and its trust in the welfare-maximizing virtues of free-market economies as opposed to the much less confident outlook endorsed by heterodox economics (Laidler, 2010).

3 ECONOMISTS UNDER TRIAL: WHY DID THEY FAIL TO FORESEE THE CRISIS?

The main charge levelled against economists as a profession during the innumerable 'trials of economists' celebrated in the last two years is basically the following: *economists failed to predict the crisis*. Many critics have also maintained that economics is a pseudo-science, more akin to astrology than to astronomy, that economists' meetings are more like reunions of wizards than scientific assemblies, and that it would be best for economists to maintain silence, at least for a few years. (See the speech by the Italian Minister for Finance, Giulio Tremonti, at the People's Friendship Meeting, 2009.)

A possible line of defence against such a charge could consist in singling out some 'prophetic' contributions, that is, papers written by economists warning about the possible outbreak of the crisis before spring 2007. In this regard, the names heard most frequently are those of Rajan (2005) and Shiller (2000 and 2003). This line of defence is taken, for example, by Spaventa (2009) who nonetheless acknowledges that such 'prophets of doom' were few and far between in the economics profession: 'In

general, dissenters were often treated as those boring old aunts always having something to grumble about at family parties' (pp. 2–3). Likewise, Perotti (2009) claims that 'the vast majority of economists neither foresaw nor understood the financial crisis because they were totally unaware of some fundamental developments in the credit market' (my translation). An unpublished paper by Imperia and Maffeo (2009) shows that it is very hard to find prophetic contributions published by the economic journals with the highest impact factor and thus representative of mainstream economics, while the situation is totally different as regards non-mainstream journals. From this evidence, the two authors draw the conclusion that heterodox economics, particularly that of Keynesian inspiration, is better equipped than orthodoxy to understand the causes of the crisis and to point out possible remedies.

In my view, the above remarks show that economists need a more robust line of defence than the search for single prophetic contributions. It should be pointed out to critics that the (incontrovertible) fact that the majority of economists were unable to foresee the US sub-prime collapse means neither that economics is a pseudo-science nor that economists should be sentenced to silence. In this regard, the philosophy of science may come to the aid of economists. The problem boils down to the following question: *Is it legitimate to adopt the capacity to foresee accurately as the dividing line between science and pseudo-science and to infer from only one, albeit macroscopic, case of failure the non-scientific nature of a discipline?* A thorough answer to such a question would require a whole volume on the logic and history of science. That said, any answer (whether positive or negative) would be highly controversial since, as epistemologists know, all scientific research programmes (to use Lakatos' terminology) grow 'in a sea of anomalies, and counter-examples are merrily ignored' (see the seminal work by Lakatos and Musgrave, 1970). Unfortunately, binding widely-shared criteria have not yet been devised to ascertain whether a given scientific research programme has entered into a (theoretically or empirically) regressive phase and therefore has to be abandoned. From this point of view, the allocation of public and private resources for financing one scientific research programme rather than another is partly a matter of chance (albeit not entirely random). In any case, the relationship between theory and facts is much more complex than recent critics of economics seem to hold.

Yet the critics' position (a discipline unable to predict accurately should not, *ipso facto*, be considered scientific) deserves further investigation. In my view, this claim is a naive version of the so-called *Symmetry Thesis*. According to the latter, a perfect logical symmetry exists between the operation called explanation and that called prediction within all truly

scientific theories: ‘explanation is simply prediction written backwards’ (Blaug, 1992: 5). Therefore, taking the symmetry thesis to its logical conclusion, it may be maintained that the inability of a given discipline to foresee accurately implies its inability to explain adequately, hence its lack of truly scientific content.⁸ The symmetry thesis takes its clue from the hypothetico-deductive model of scientific explanation, codified by Hempel and Oppenheim (1948). The latter claim that all truly scientific explanations involve an *explanans* constituted by two sets of elements:

- a. a list of initial conditions; and
- b. (at least) one universal law.

The explanation of the phenomenon *explanandum* comes from a correct application of the standard rules of deductive logic to (a) and (b): ‘The event under discussion is explained by subsuming it under general laws, i.e. by showing that it occurred in accordance with those laws by virtue of the realization of certain specified antecedent conditions.’ (Hempel and Oppenheim, 1948: 136)

Within the hypothetico-deductive model a given wrong forecast could derive from the fact that the *explanans* of the theory under examination contains stochastic (that is, non-deterministic) universal laws and/or that initial conditions have not been duly specified. Therefore, within the model a given wrong forecast by no means implies that the theory under scrutiny is irreparably flawed. Such a conclusion holds, *a fortiori*, for a social science such as economics whose universal laws are stochastic in nature and an exhaustive list of initial conditions is nearly impossible. To put it in a nutshell, economics is a discipline, not a science: economic theories, being always subject to a *ceteris paribus* clause, can offer at best ‘weak explanations’ (Hicks, 1983: 371). Therefore, economists, when they participate in public debates, should make it clear that they do not possess any knowledge of Truth (with capital T). As is taught in any first-year course of statistics, stating that ‘given a significance level of ___%, available evidence does not allow the hypothesis H_0 to be rejected’ in no way means that the hypothesis H_0 is true in the ordinary sense of the word.⁹

Intellectual modesty is a great virtue in economics also for the following reason. As recently emphasized by Gilles Saint-Paul (2009):

[in the economic world] beliefs about the future and about how the economy works affect the trajectory [of the object under study]. [. . .] The actual behavior of markets, unlike an immutable deterministic law of nature, depends on the beliefs of the markets, including their understanding of economic phenomena and their consequences for asset prices.

Thus, when economists propose to the general public their models on how the economy works, their solutions to the economic problems of the day inevitably influence people's beliefs and expectations and thus heavily contribute to forging the very object of their study.¹⁰ Here, in my view, is the main reason why economists are to blame for the present turmoil. Drastically simplifying the issue, it may be claimed that, in the pre-crisis years, the economic theory spread by the media and taught in first-year macroeconomics courses at the top universities was highly confident in the ability of free-market economies to determine an efficient allocation of economic resources, albeit in the long run. The macroeconomic consensus at the time is thus summarized by Taylor (2000: 90):

First, the long-run real GDP trend, or potential GDP, can be understood using the growth model that was first developed by Robert Solow and that has now been extended to make 'technology' explicitly endogenous. Second, there is no long-run trade-off between inflation and unemployment, so that monetary policy affects inflation but is otherwise neutral with respect to real variables in the long run. Third, there is a short-run trade-off between inflation and unemployment with significant implications for economic fluctuations around the trend of potential GDP; the trade-off is due largely to temporarily sticky prices and wages.

Hence, cyclical fluctuations are traced back either to exogenous (mainly supply-side) shocks or to plain policy errors. From this theoretical perspective, active fiscal and monetary policies are considered more as part of the problem than as part of the solution:

Fifty-some years ago, when I began to study economics, students were taught that the private sector had no tendency to gravitate to full employment, that it was prone to undesirable fluctuations amplified by multiplier and accelerator effects, and that it was riddled with market failures of various sorts. But it was also believed that a benevolent, competent, democratic government could stabilise the macroeconomy and reduce the welfare consequence of most market failures to relative insignificance. Fifty years later, in the beginning years of this century, students were taught that representative governments produce pointless fluctuations in prices and output but, if they can be constrained from doing so – by an independent central bank, for example – free markets are sure to produce full employment and, of course, many other blessings besides. (Leijonhufvud, 2009: 1)

Once it is granted that free-market economies provide an efficient resources allocation, a likely next step is to hold the belief that free markets are able to create *by themselves* the right 'rules of the game' and the right sanctions for misbehaviour. Supporters of this view usually claim that the necessity to keep and possibly increase one's own reputational

capital is a sufficient deterrent against individual opportunistic behaviour. Accordingly, public authorities should only adopt a soft-touch regulation of markets.¹¹ Thus, a first lesson that the crisis may teach mainstream economists is that markets (particularly, financial markets) may not be able to solve by themselves the distortions caused by individual opportunistic behaviour. This means that both academic economists and those working for public authorities should reconsider the issue of regulation and control of the financial markets:

Forgetting the institutional foundations of markets, we mistakenly equated free markets with unregulated markets. Although we understand that even unfettered competitive markets are based on a set of laws and institutions that secure property rights, ensure enforcement of contracts, and regulate firm behaviour and product and service quality, we increasingly abstracted from the role of institutions and regulations supporting market transactions in our conceptualisation of markets. [. . .] We must now start building a theory of market transactions that is more in tune with their institutional and regulatory foundations. We must also turn to the theory of regulation – of both firms and financial institutions – with renewed vigour and hopefully additional insights gained from current experience. (Acemoglu, 2009: 2)

A second lesson is that the results achieved by modern microeconomic theory in terms of sub-optimality of equilibria when markets are plagued with information asymmetries involve macroeconomic consequences that cannot be further neglected. As argued by Spaventa (2009: 3), contemporary macroeconomic models arising from the debate between the New Classical and New Keynesian economists are rigorously micro-founded. Yet their micro-foundations are hardly compatible with the rise and the bursting of financial crises. In particular, such models assume that (i) asset prices reflect the set of available information, thus ruling out the phenomenon of asymmetric information; and (ii) agents are always on their intertemporal budget constraint, thus ruling out the phenomenon of bankruptcy.¹²

4 A DIFFERENT VIEW ON FREE-MARKET ECONOMIES: THE FINANCIAL INSTABILITY HYPOTHESIS

The dissatisfaction with contemporary macro-models may provide a stimulus to elaborate a macroeconomic theory that (a) does not depict crises as exceptional or negligible events; (b) shows that crises may arise from purely financial motives; and (c) explains the mechanisms of the contagion from the financial markets to the commodity and labour markets:

The macroeconomic models currently used fail to explain causes and consequences of the accumulation of financial imbalances and ample variations in asset prices. It is only recently that models describing the transmission channels of monetary policy have started to highlight the complexity of the intermediation process, interactions among intermediaries, the causes and effects of large-scale portfolio reallocations, the possibility of speculative bubbles, and the feedback relationships between the financial sector and the real sector of the economy. Assessment of the systemic risk that derives from the increasing interdependence among economies, sectors, economic agents, brought about by market liberalization and financial innovation, is the field in which it is urgent to invest. It is the challenge for the new generation of economists. (Draghi, 2009: 6, my translation)

To be equal to the task pointed out by the Governor of the Bank of Italy, Mario Draghi, inspiration may be drawn from a research tradition that, up to the bursting of the crisis, appeared definitively buried in the cemetery of the history of economic thought, in the section devoted to fallacious theories: Keynesian economics. In Chapter 12 of his *The General Theory of Employment, Interest and Money* (1936, now reproduced in vol. VII of *The Collected Writings of John Maynard Keynes*, (Johnson and Mogggridge, 1971–89)) bearing the title ‘The state of long-term expectation’, Keynes emphasizes that financial markets, allowing the trading of securities representative of real capital goods, have made liquid for the individual investor what it is illiquid for society: investment. On the one hand, this favours the very same investment process: few entrepreneurs would bet their own money on long-term and uncertain investment projects if they did not have, at any moment, the opportunity to sell their own investment in the financial markets, that is, to turn it into liquid money. (As noted by Keynes, few men would get married in the absence of the institution of divorce!). On the other hand, such an opportunity provided by financial markets to any individual investor constitutes a strong element of instability for the investment process at the economy level (and, through the *multiplier* mechanism, for aggregate demand and aggregate income and employment) since it opens the way to short-term speculation. Keynes’s thought in this regard is worth a full quotation:

It might have been supposed that competition between expert professionals, possessing judgment and knowledge beyond that of the average private investor, would correct the vagaries of the ignorant individual left to himself. It happens, however, that the energies and skill of the professional investor and speculator are mainly occupied otherwise. For most of these persons are, in fact, largely concerned, not with making superior long-term forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public. They are concerned, not with what an investment is really worth to a man who

buys it 'for keeps', but with what the market will value it at, under the influence of mass psychology, three months or a year hence. [. . .] *Of the maxims of orthodox finance none, surely, is more anti-social than the fetish of liquidity, the doctrine that it is a positive virtue on the part of investment institutions to concentrate their resources upon the holding of 'liquid' securities. It forgets that there is no such thing as liquidity of investment for the community as a whole.* The social object of skilled investment should be to defeat the dark forces of time and ignorance which envelop our future. The actual, private object of the most skilled investment to-day is 'to beat the gun', as the Americans so well express it, to outwit the crowd, and to pass the bad, or depreciating, half-crown to the other fellow. (emphasis added)

In so far as speculative traders do not internalize all economic consequences arising from their trading activity, short-term speculative trading in financial markets involves a strong negative externality. Consistent with this formulation, Keynes proposes the introduction of a tax on Stock Exchange negotiations in order to close the gap between the private marginal cost and the social marginal cost of short-term speculation:¹³

It is usually agreed that casinos should, in the public interest, be inaccessible and expensive. And perhaps the same is true of Stock Exchanges. That the sins of the London Stock Exchange are less than those of Wall Street may be due, not so much to differences in national character, as to the fact that to the average Englishman Throgmorton Street is, compared with Wall Street to the average American, inaccessible and very expensive. [. . .] The introduction of a substantial Government transfer tax on all transactions might prove the most serviceable reform available, with a view to mitigating the predominance of speculation over enterprise in the United States.

Keynes's lesson on the relationship between financial markets and the investment process in free-market economies was subsequently developed by Hyman P. Minsky, a long-forgotten economist today (re)discovered by many commentators (see Whalen, 2008 and Yellen 2009. For a thorough assessment of Minsky's heritage see Bellofiore and Ferri, 2001).

Perhaps the most surprising conclusion stemming from Minsky's contribution is that *economic stability is destabilizing* since a prolonged period of stable growth without inflation induces the actors in the financial markets to believe that future gross incomes will continue to rise and therefore an increasing debt-to-equity ratio will be sustainable: 'Stable growth is inconsistent with the manner in which investment is determined in an economy in which debt-financed ownership of capital-assets exists and in which the extent to which such debt-financing can be carried is determined by the market.' (Minsky, 1977)

This is what Minsky calls the *Financial Instability Hypothesis*, that is a 'theory of how a capitalist economy endogenously generates a financial

structure which is susceptible to financial crises and how the normal functioning of financial markets in the resulting boom economy will trigger a financial crisis.' (ibid.) Minsky's analysis starts from the observation that accumulation of capital goods in modern capitalist economies is largely carried out through debt financing. Debt financing involves the exchange of present money (which is certain) for future money (which is, obviously, uncertain). Thus, behind the world of real commodities (consumption and capital goods), there is a 'paper world' made of liabilities to pay money at dates specified or as conditions arise, irrespective of whether or not the future profits expected by the borrowers are realized:

The viability of this paper world rests upon the cash flows (or gross profits after out-of-pocket costs and taxes) that business organizations, households, and governmental bodies, such as states and municipalities, receive as a result of the income-generating process. [. . .] The validation of business debt requires that prices and outputs be such that almost all firms earn large enough surpluses over labor and material costs either to fulfill the gross payments required by debt or to induce refinancing. Refinancing takes place only if gross profits are expected to be large enough either to validate the new debt or to induce further refinancing (ibid.)

In this regard Minsky distinguishes between (a) hedge finance; (b) speculative finance; and (c) ultra-speculative or Ponzi finance. In the first case, in any given period, capital gross income exceeds the flows of debt payments by a safe margin. In the second case, in the initial periods the flows of debt payments exceed capital gross income, while in the following periods the opposite holds. However, the present value of expected cash receipts is greater than the present value of payment commitments (unless interest rates increase sharply and unexpectedly). Finally, in the third case, during the whole life of the debt, the flows of interest payments exceed capital gross income. Hence, units engaged in a Ponzi finance scheme are forced to make new debts just to be able to pay the interests on previous debt. As remarked by Minsky (1980), since such refinancing is available only if the total cash inflows expected by a Ponzi unit exceed its total cash outflows, the survival of a Ponzi unit often depends on the expectation that, at a given future time, certain assets may be sold at a sufficiently high price. The US sub-prime market bubble is thus a typical instance of a Ponzi finance. Banker α is willing to grant to the part-time worker β a mortgage loan even if the expected net income of β is uncertain or unable to match the interest payments (at least in some of the periods of the debt lifetime) since α expects a steady increase in the market value of the house purchased by β . Thus, α believes that, in the event of β 's insolvency, he/she could get enough from the sale of β 's house to recover the residual instalments of the loan unpaid by β :

Understanding the subprime crisis requires understanding the role played by the GSEs (Fannie Mae and Freddie Mac). They increased the demand for the housing stock through subsidies that raised the homeownership rate to an unsustainable level, and, as a consequence of a relatively inelastic supply of housing due to land and local zoning constraints, contributed to a sustained rise in house prices. *That rise in housing prices made the issuance of subprime and Alt-A loans appear relatively risk free.* (Hetzl, 2009: 217, emphasis added)

Part of the decline [in underwriting standards in the prime and subprime mortgage] may have stemmed from the rapid price escalation in the value of the underlying collateral – the land and structures that secured the mortgage. This led many strapped borrowers and their lenders/investors to believe that the borrowers could refinance their way out of any payment problems. Lenders and investors also came to believe that ever-escalating home prices would eliminate any loss in the event that a risky borrower defaulted and the loan was foreclosed. (Utt, 2008)

Obviously, as long as the house market price keeps rising, *_'s* expectations are *ex post* confirmed. Increasing numbers of people are induced to invest their (own or borrowed) money in the real estate market so that the property demand curve becomes positively sloped (higher prices lead to higher demand) and a speculative bubble starts.¹⁴

As recalled above, for Minsky a typical feature of free-market economies experiencing a period of prolonged prosperity is the spread of expectations of further rises of Stock Exchange and further increases in corporate profits and dividends. Accordingly, people and firms are increasingly prepared to pass from hedge to speculative financing and from speculative to Ponzi financing. As a consequence, the economy's overall degree of financial fragility increases: 'Over a period of good years the weight of units with speculative and Ponzi positions increases, and the economy becomes more fragile: a minor shock may initiate a major debt deflation which, if not opposed by active economic policy, may lead to a deep and long depression.' (Bellofiore and Ferri, 2001: 15)

Thus, from Minsky's perspective, it comes as no surprise that a minor shock such as the collapse of the US sub-prime mortgage loan market led the world economy into a long deep depression.

What, for Minsky, makes a substantial difference between the highly unstable pre-1929 economies and modern less-unstable economies are: (i) the dimension of government deficits; and (ii) the rapidity and extent of Central Bank interventions in the financial markets (see in particular Minsky, 1980). As regards point (i) modern large public deficits sustain aggregate demand (Keynes) and corporate aggregate profits (Kalecki) when private (consumption and investment) expenditure declines. As regards point (ii), mindful of the 1929 bank run and the consequent credit

squeeze, debt-deflation spiral and mass unemployment, central banks take seriously their role as lenders-of-last-resort. Yet Minsky is aware that there are two sides to the coin: while modern fiscal and monetary interventionist policies make post-1929 free-market economies less prone to violent financial cycles, they bring about inflationary bias and a reduction in the economy's potential growth rate.

5 FINAL REMARKS

In this chapter I discussed some of the factors that may have played a role in causing the present financial turmoil. In particular, I focused on three different theoretical explanations: (i) errors in monetary policy management; (ii) asymmetric information and distortion of incentive structures in financial markets; and (iii) growing inequality in income distribution coupled with increasing working class indebtedness. Obviously, the explanation eventually gaining most consensus will set the policy agenda for the years to come. I also sought to defend economics from the recurrent charge of not being a truly scientific discipline since, according to critics, its practitioners were unable to foresee the crisis. I argued that economists' responsibility for the present financial dislocation lies elsewhere, in their over-optimistic attitude towards the way free-market economies actually work. Finally, as an alternative to mainstream economics I briefly sketched Keynes's and Minsky's contributions on the relationship between investment and finance. In particular, the latter depicts capitalism as a fragile system, prone to continuous wide-ranging booms and recessions, unless carefully regulated by public authorities and other economic institutions. Therefore, from a Keynesian perspective the crisis should remind economists that one of their most demanding tasks is to design the appropriate set of policies and institutions required to promote public prosperity and happiness in the ever-evolving environment generated by free-market economies.

NOTES

- * An extended version of this chapter in Italian was presented to a Ph.D. seminar, 'Gli economisti allo specchio della crisi', organized by the Dottorato in Diritto Comunitario e Diritto Interno [PhD programme in European Community Law and Italian National Law], Law Faculty, University of Palermo, 11 February 2010. I wish to thank Laura Lorello for her kind invitation to the seminar, and Michele Battisti, Carlo Panico and Andrea Salanti for their comments on a previous version of this chapter. Usual caveats apply.

1. The global movement towards a softer regulation of financial markets also comes from the competition among countries in the attempt to attract the international flows of financial capital: 'While regulation is national, finance is global. The location of financial enterprises and markets is endogenous; many are very footloose. A thriving financial sector creates jobs and wealth, and is generally environmentally friendly. So regulators try to retain and attract financial businesses to their jurisdictions in part by offering more liberal, less onerous regulations. This competition through regulatory standards has led to less stringent regulation almost everywhere.' (Buiter, 2007: 6). Moreover, a role not yet sufficiently analysed in the implementation of 'easy-going' financial legislation has been played by the lobbying performed by private financial institutions (Igan et al., 2010).
2. Taylor has recently written a book (Taylor, 2009b) reproaching the Fed for deviating from the so-called Taylor rule in the years before the crisis. The Taylor rule (Taylor, 1993) prescribes how a Central Bank should adjust its interest rate instrument according to the differential between actual and planned inflation and between actual and potential output. For a critical assessment of the interpretations of the crisis based on the Taylor rule see Brancaccio and Fontana (2009).
3. The idea that brokers tend to mimic the behaviour of their colleagues/competitors is not new. In his 1937 essay 'The general theory of employment' (*Quarterly Journal of Economics*), in which he summarized the main tenets of his new revolutionary economic theory, Keynes wrote: 'Knowing that our individual judgment is worthless, we endeavour to fall back on the judgment of the rest of the world which is perhaps better informed. That is, we endeavour to conform with the behaviour of the majority or the average. The psychology of a society of individuals each of whom is endeavouring to copy the others lead to what we may strictly term a *conventional* judgment.' (Keynes's emphasis. This essay is now reproduced in *The Collected Writings of John Maynard Keynes*, vol. XIV, pp. 109–23). Recently, herd behaviour was analysed by Banerjee (1992).
4. In the past two decades, a rising debt-to-income ratio and the consequent rise in households' financial fragility has become a common feature of many industrialized countries besides the USA: see Rinaldi and Sanchis-Arellano (2006).
5. Sir John Hicks once claimed that economic theories are 'rays of light, which illuminate a part of the target, leaving the rest in the dark. As we use them, we avert our eyes from things that may be relevant, in order that we should see more clearly what we do see. It is entirely proper that we should do this, since otherwise we should see very little. But it is obvious that a theory which is to perform this function satisfactorily must be well chosen; otherwise it will illumine the wrong things' (Hicks, 1976: 208)
6. Though not declared heterodox economists, Fitoussi and Stiglitz (2009: 5) put at the top of their list of recommendations a series of fiscal and social security measures to reverse the present trend of income distribution in order to stimulate aggregate demand in the medium to long run.
7. The symmetry thesis has been submitted to harsh criticisms. In fact, *contra* it is possible to mention two of the best-known scientific theories, that is, Newton's theory of universal gravitation (a theory that predicts but does not explain) and Darwin's theory of the evolution of living species (a theory that explains but does not predict): see Blaug (1992: 5 ff).
8. In the statistics jargon α is the probability of committing a Type I error, that is, the rejection of an H_0 hypothesis which is actually true; while β is the probability of committing a Type II error, that is, the failure to reject an H_0 hypothesis which is actually false. Making an analogy with the logic of criminal trial, it may be said that a Type I error is the conviction of an innocent, while a Type II error is the acquittal of a culprit. Given the amount of available evidence both in statistics and criminal law, an inevitable trade-off exists between these two kinds of errors.
9. This is particularly evident within the rational expectations approach in economics: 'expectations since they are informed predictions of future events are essentially the same as the predictions of the relevant economic theory' (Muth, 1961: 316).

10. For example White (2009: 39) explicitly supports the superiority of market discipline thesis over public supervision in the banking system.
11. Goodfriend (2002) provides an easily-accessible introduction to contemporary macro-models.
12. The proposed tax on financial transactions to mitigate short-term speculative fluctuations today takes the well-known name of the Tobin tax, from the US Nobel laureate, James Tobin, who proposed it in the early 1970s.
13. To have a complete description of what has happened in the last few years it is necessary to add to Minsky's analysis an element that, in his time, was still in its embryonic state: the securitization process, that is, the possibility of converting the idiosyncratic loan relationship between _ and _ into a negotiable instrument traded within an ample set of financial operators. Thanks to these operations of derived finance, lender _ frees him/herself from the insolvency risk of borrower _ and gets fresh liquidity to use in new financial operations.

REFERENCES

- Acemoglu, D. (2009), 'The crisis of 2008: structural lessons for and from economics', *CEPR Policy Insight*, no. 28.
- Banerjee, A.V. (1992), 'A simple model of herd behavior', *The Quarterly Journal of Economics*, **107**, 797–817.
- Barba, A. and Massimo Pivetti (2009), 'Rising household debt: its causes and macroeconomic implications – a long-period analysis', *Cambridge Journal of Economics*, **33**, 113–37.
- Bellofiore, R. and P. Ferri (eds) (2001), *The Economic Legacy of Hyman Minsky*, 2 vols, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.
- Bernanke, B.S. (2004), 'The great moderation', remarks by Governor Ben S. Bernanke at the meetings of the Eastern Economic Association, Washington, DC, available at <http://www.federalreserve.gov/BOARDDOCS/SPEECHES/2004/20040220/default.htm>.
- Bernanke, B.S. (2005), 'The global saving glut and the US current account deficit', remarks by Governor Ben S. Bernanke at the Sandridge Lecture, Virginia Association of Economics, available at <http://www.federalreserve.gov/boarddocs/speeches/2005/200503102/default.htm>.
- Blaug, M. (1992), *The Methodology of Economics. Or How Economists Explain*, 2nd edn, Cambridge: Cambridge University Press.
- Brancaccio, E. and G. Fontana (2009), 'A critique of interpretations of the crisis based on the "Taylor Rule"', available at <http://www.theglobalcrisis.info/docs/relazioni/BrancaccioFontana.pdf>.
- Buiter, W. (2007), 'Lessons from the 2007 financial crisis', *CEPR Policy Insight*, no. 18.
- Cecchetti, S.G. (2008), 'Monetary policy and the financial crisis of 2007–2008', *CEPR Policy Insight*, no. 21.
- Diamond, D.W. and R.G. Rajan (2009), 'The credit crisis: conjectures about causes and remedies', *The American Economic Review*, **99**, 606–10.
- Draghi, M. (2009), 'Gli economisti e la crisi', presentation at the Società Italiana degli Economisti, 50th Riunione Scientifica Annuale, Rome, available at <http://www.adapt.it/acm-on-line/Home/documento3518.html>.

- Fitoussi, J.P. and J.E. Stiglitz (2009), 'The Shadow Gⁿ*: The ways out of the crisis and the building of a more cohesive world, available at <http://www.ofce.sciences-po.fr/pdf/dtravail/WP2009-17.pdf>.
- Goodfriend, M. (2002), 'Monetary policy in the new neoclassical synthesis: a primer', *International Finance*, **5**, 165–91.
- Hegel, G.W.F. ([1820] 2001), *Philosophy of Right*, Kitchener, ON: Batoche Books, available at <http://www.efm.bris.ac.uk/het/hegel/right.pdf>.
- Hempel, C.G. and P. Oppenheim (1948), 'Studies in the logic of explanation', *Philosophy of Science*, **15**, 135–75.
- Hetzl, R.L. (2009), 'Government intervention in financial markets: stabilizing or destabilizing?', in Alfredo Gigliobianco and Gianni Toniolo (eds), *Financial Market Regulation in the Wake of Financial Crises: The Historical Experience*, Banca d'Italia, *Seminari e Convegni*, no. 1, pp. 207–21.
- Hicks, J.R. (1976), "'Revolutions" in economics'. in Spiro J. Latsis (ed.), *Method and Appraisal in Economics*, Cambridge: Cambridge University Press.
- Hicks, J.R. (1983), 'A discipline, not a science'. in *Collected Essays on Economic Theory*, vol. III, *Classics and Moderns*, Oxford: Basil Blackwell.
- Igan, D., P. Mishra and T. Tressel (2010), 'Lobbying and the financial crisis', available at <http://www.voxeu.org/index.php?q=node/4530>.
- Imperia, A. and V. Maffeo (2009), 'As if nothing were going to happen: a search in vain for warnings about the current crisis in economic journals with the highest impact factors', available at http://www.boeckler.de/pdf/v_2009_10_30_imperia_maffeo.pdf.
- Johnson, E. and D.E. Moggridge (eds) (1971–1989), *The Collected Writings of John Maynard Keynes* (30 Volumes). London and New York: Macmillan and Cambridge University Press. *The General Theory of Employment, Interest and Money* (1936) is available at: <http://www.marxists.org/reference/subject/economics/keynes/general-theory/>.
- Keynes, J.M. (1937), 'The general theory of employment', *Quarterly Journal of Economics*, reproduced in *The Collected Writings of John Maynard Keynes*, vol. XIV, New York: Macmillan, St Martin's Press, pp. 109–23.
- Laidler, D. (2010), 'Lucas, Keynes and the crisis', *Journal of the History of Economic Thought*, **32**, pp. 39–62.
- Lakatos, I. and A. Musgrave (eds) (1970), *Criticism and the Growth of Knowledge*, Cambridge: Cambridge University Press.
- Leijonhufvud, A. (2009), 'Macroeconomics and the crisis: a personal appraisal', *CEPR Policy Insight*, no. 41.
- Minsky, H.P. (1977), 'The financial instability hypothesis: an interpretation of Keynes and an alternative to 'standard' theory', reprinted as Chapter III of H.P. Minsky (1982), *Can 'It' Happen Again? Essays on Instability and Finance*, New York: M.E. Sharpe.
- Minsky, H.P. (1980), 'Finance and profits: the changing nature of American business cycles', reprinted as Chapter II of H.P. Minsky (1982), *Can 'It' Happen Again? Essays on Instability and Finance*, New York: M.E. Sharpe.
- Muth, J.F. (1961), 'Rational expectations and the theory of price movements', *Econometrica*, **29**, 315–35.
- Onado, M. (2009), *I Nodi al Pettine. La Crisi Finanziaria e le Regole non Scritte*, Roma-Bari: Laterza.
- Perotti, R. (2009), 'Economisti alla sbarra, ecco l'atto di accusa', *Il Sole 24 Ore*, 27 May, available at <http://www.ilsole24ore.com/art/SoleOnline4/dossier/>

- Economia%20e%20Lavoro/2009/lezioni-per-il-futuro/27-maggio/economisti-sbarra-atto-accusa.shtml.
- Rajan, R. (2005), 'Has financial development made the world riskier?', *Proceedings, Federal Reserve Bank of Kansas City*, August, pp. 313–69.
- Rinaldi, L. and A. Sanchis-Arellano (2006), 'Household debt sustainability. What explains household non-performing loans? An empirical analysis', *European Central Bank Working Paper Series*, no. 570.
- Saint-Paul, G. (2009), 'A "modest" intellectual discipline: in defence of contemporary economics', available at <http://www.voxeu.com/index.php?q=node/3996>.
- Shiller, R.J. (2000), *Irrational Exuberance*, Princeton, NJ: Princeton University Press.
- Shiller, R.J. (2003), *The New Financial Order: Risk in the 21st Century*, Princeton, NJ: Princeton University Press.
- Spaventa, L. (2009), 'Economists and economics: what does the crisis tell us?', *CEPR Policy Insight*, no. 38.
- Stiglitz, J.E. (2009), 'The current economic crisis and lessons for economic theory', *Eastern Economic Journal*, **35**, pp. 281–96.
- Tabellini, G. (2009), 'Il mondo ritorna a correre, l'Italia non si fermi', *Il Sole 24 Ore*, 24 June, available at <http://www.ilsole24ore.com/art/SoleOnline4/dossier/Economia%20e%20Lavoro/2009/lezioni-per-il-futuro/24-giugno/tabel lini.shtml>.
- Taylor, J.B. (1993), 'Discretion versus policy rules in practice', *Carnegie-Rochester Conference Series on Public Policy*, **39**, pp. 195–214.
- Taylor, J.B. (2000), 'Teaching modern macroeconomics at the principles level', *The American Economic Review, Papers and Proceedings*, **90**, pp. 90–94.
- Taylor, J.B. (2009a), 'How government created the financial crisis', *The Wall Street Journal*, 9 February, available at http://www.stanford.edu/~johtayl/How_Government_Created_the_Financial_Crisis-WSJ-2-9-09.pdf.
- Taylor, J.B. (2009b), *Getting Off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis*, Stanford, CA: Hoover Press.
- Tremonti, Giulio (2009), Speech at the People's Friendship Meeting, 28 August, available at http://it.wikipedia.org/wiki/Giulio_Tremonti.
- Utt, R. (2008), 'The subprime mortgage market collapse. A primer on the causes and possible solutions', available at <http://www.heritage.org/Research/Reports/2008/04/The-Subprime-Mortgage-Market-Collapse-A-Primer-on-the-Causes-and-Possible-Solutions>.
- Whalen, C.J. (2008), 'The credit crunch: a Minsky moment', *Studi e Note di Economia*, no. 1, pp. 3–21.
- White, E.N. (2009), 'Lessons from the history of bank examination and supervision in the United States, 1863–2008', in Alfredo Gigliobianco and Gianni Toniolo (eds), *Financial Market Regulation in the Wake of Financial Crises: The Historical Experience*, Banca d'Italia, *Seminari e Convegni*, no. 1, pp. 15–44.
- Yellen, J.L. (2009), 'A Minsky meltdown: lessons for central bankers', presentation to the 18th Annual Hyman P. Minsky Conference on the state of the US and world economies, 'Meeting the challenges of the financial crisis'; available at <http://www.frbsf.org/news/speeches/2009/0416.html>.