

The Credit Crisis and Recession as a Paradigm Test

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Abstract: This paper contributes to the debate on what economics can learn from the credit crisis and recession. It asks what are the elements in the mainstream paradigm that caused many economists to misjudge the state of the economy so dramatically in the years leading up to the 2007 credit crisis and the 2008-2009 recession. It scrutinizes the work of twelve economists who warned of the crisis and identifies, as the common elements in their thinking, financial assets, debt, the flow of funds and behavioral assumptions on uncertainty, bounded rationality and non-optimizing behavior. These are then contrasted to mainstream thinking. The conclusion is that economics, if it is to be relevant to reality, should stop neglecting money, wealth and debt, and turn away from an individualistic view and toward a systemic view of the economy.

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The recent credit crisis and recession are seen to have discredited the mainstream economic paradigm because so many economists “got it so wrong” (Krugman 2009). Friedman (2009) linked both when he wrote on “the failure of the economy and the economists.” The present paper takes this view as a starting point rather than a conclusion. It asks what, precisely, are the elements in the mainstream paradigm that caused many economists to misjudge the state of the economy so dramatically in the years leading up to the 2007 credit crisis and the 2008-2009 recession? In order to address this question, this paper adopts an inductive approach. The research method is to scrutinize the work of twelve economists who warned of the crisis and to identify the common elements in their thinking. This is then contrasted to mainstream thinking. This is a new angle, as neither Krugman nor Friedman paid much attention to those economists who did not “get it wrong” (see also Galbraith 2009). Moreover,

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it allows for an identification of critical elements of a more realistic economics based on the works of those economists themselves – rather than through the prism of those, like Krugman and Friedman, who did not warn beforehand that a financial crisis was brewing.

Previewing the results, we will find that those who “saw it coming” in their analyses emphasized financial assets, debt, the flow of funds and the overarching accounting identities in the macroeconomy as the context and constraints to economic development – elements absent from most forecasting and scenario evaluation models in official use (such as Dynamic Stochastic General Equilibrium, or DSGE models). Their assumptions regarding economic behavior included uncertainty and non-optimizing behavior, also in contrast to mainstream theory. Methodologically, they favor empirical work rather than theoretical formalism, and they share an aversion to methodological individualism.

In the next section the common surprise among mainstream economists is described. The third section documents the views of those who did anticipate financial instability, and the fourth section draws out common elements in their thinking. The fifth section contrasts and compares this to the mainstream paradigm. The sixth and final section concludes with a summary and reflections.

The Credit Crisis Surprise

The view that “[n]o one foresaw the volume of the current avalanche,” as Dutch central bank president Nout Wellink (2009) put it in an April 2009 speech, appears justified by a lack of discussion in the academic and policy press of the possibility that financial globalization harbored significant risks, or that the U.S. real estate market and its derivative products were in dangerous waters. Wellink (2009) quoted a 2006 IMF (International Monetary Fund) report on the global real estate boom asserting that there was “little evidence . . . to suggest that the expected or likely market corrections in the period ahead would lead to crises of systemic proportions.” On the contrary, those developments now seen as culprits of the crisis were until recently lauded by policymakers, academics, and the business community. The following examples illustrate.

In an October 12, 2005 speech to the National Association for Business Economics, then Federal Reserve Chairman Alan Greenspan spoke about the “development of financial products, such as asset-backed securities, collateral loan obligations, and credit default swaps, that facilitate the dispersion of risk . . . These increasingly complex financial instruments have contributed to the development of a far more flexible, efficient, and hence resilient financial system than the one that existed just a quarter-century ago.” In line with these beliefs of increased “resilience,” Greenspan had in February 2005 asserted the U.S. House Financial Services Committee that “I don’t expect that we will run into anything resembling a collapsing [housing] bubble, though it is conceivable that we will get some reduction in overall prices as we’ve had in the past, but that is not a particular problem.”

Similarly, the Canadian academic Philip Das, in a 2006 survey article of financial globalization, pointed out its benefits as (9) “[f]inancial risks, particularly credit risks, are no longer borne by banks. They are increasingly moved off balance sheets. Assets are converted into tradable securities, which in turn eliminate credit risks. Derivative transactions like interest rate swaps also serve the same purpose [of eliminating credit risks, DJB].” Likewise, in August 2006, the IMF published “Financial Globalization: A Reappraisal” which, despite its title, confirmed IMF conventional wisdom that “there is little systematic evidence to support widely cited claims that financial globalization by itself leads to deeper and more costly crises” (1). As to the business community, Lander (2008) reports that Klaus-Peter Müller, head of the New York branch of *Kommerzbank* for more than a decade, in a 2008 *New York Times* article asked, “Did I know in March of ’04 that there was a U.S. subprime market that was going to face serious problems in the next few years? No, I didn’t have the slightest idea. I was a happy man then.”

These assessments by the experts carried over to a popular view, enunciated in the mass media, that the recessionary impacts of the credit crisis came out of the blue. In December 2006, *USA Today* reported on the fall in house prices that had just started that summer. “The good news is that far more economists are in the optimist camp than the pessimist camp. Although a handful are predicting the economy will slide into a housing-led recession next year, the majority anticipate the economy will continue to grow” (Hagenbauch 2006). Kaletsky (2008) wrote of “those who failed to foresee the gravity of this crisis – a group that includes Mr. King, Mr. Brown, Alistair Darling, Alan Greenspan and almost every leading economist and financier in the world.”

The surprise at this gravity was proportionate to the optimism beforehand. Greenspan in his October 2008 testimony before the Committee of Government Oversight and Reform professed to “shocked disbelief” while watching his “whole intellectual edifice collapse in the summer of 2007.” Das (2008) conceded that contrary to his earlier view of financial globalization “eliminating” credit risks, in fact “[p]artial blame for the fall 2008 meltdown of the global financial market does justly go to globalization.” The typical pattern was one of optimism shortly before and surprise shortly after the start of the crisis.

Other Assessments

This mainstream view was not the only one, despite frequent assertions such as “I do not know anyone who predicted this course of events,” as Glenn Stevens, Governor of the Reserve Bank of Australia (RBA) said on December 9, 2008 (RBA 2008). Nor were the forebodings only vague, or the warnings made only by outsiders to the community of serious analysts. In this section I document analysis and public predictions of financial instability induced by falling real estate prices and leading to recession.

A major concern in collecting these data must be the “stopped clock syndrome.” A stopped clock is correct twice a day, and the mere existence of predictions is not

informative on the theoretical validity of such predictions since, in financial market parlance, “every bear has his day.” Elementary statistical reasoning suggests that given a large number of commentators with varying views on some topic, it will be possible to find any prediction on that topic, at any point in time. With a large number of bloggers and pundits continuously making random guesses, erroneous predictions will be made and quickly assigned to oblivion, while correct guesses will be magnified and repeated after the fact. This in itself is no indication of their validity, but only of confirmation bias.

In distinguishing the lucky shots from insightful predictions, the randomness of guesses is a feature to be exploited. Random guesses are supported by all sorts of reasoning (if at all), and will have little theory in common. Conversely, for a set of correct predictions to attain *ex post* credibility, it is additionally required that they are supported by a common theoretical framework. This study, then, looks to identify a set of predictions which are not only *ex post* correct but also rest on a common theoretical understanding. This will help identify the elements of a valid analytical approach to financial stability, and get into focus the contrast with conventional models.

In collecting these cases in a search of the relevant literature, four selection criteria were applied. Only analysts who provide some account on how they arrived at their conclusions were included. Second, the analysts included went beyond predicting a real estate or credit derivatives crisis, also making the link to real-sector recessionary implications, including an analytical account of those links. Third, the actual prediction must have been made by the analyst and available in the public domain, rather than being asserted by others. Finally, the prediction had to have some timing attached to it. Applying these criteria led to the exclusion of a number of (often high profile) candidates so that the final selection is truly the result of critical scrutiny. At the same time, there is no pretension of completeness. The list in Table 1 is not intended as exhaustive or even final. In the Appendix, I briefly discuss some other possible candidates for the list of those who “saw it coming.” The “Got It Right” Project at the Association for Evolutionary Economics (AFEE) web site provides many more names and sources (AFEE 2010).

A summary overview of these analysts and their assessments is presented in Table 1. The twelve analysts described there – the number is entirely an outcome of the selection criteria – commented on the United States, UK, Australian, Danish and global conditions in housing, finance and the broader economy. This selection, first publicized in June 2009 when an earlier version of the present paper went online, has since been endorsed more widely. Edward Fullbrook, editor of the heterodox *Real World Economics Review*, in early 2010 created the Revere Award. The prize was named in honor of Paul Revere and his famous ride through the night on April 18, 1775, to warn Americans of the approaching British army. The prize was to be given to the three economists “who first and most clearly anticipated and gave public warning of the Global Financial Collapse [GFC] and whose work is most likely to prevent another GFC in the future.” After electronic voting by over 2,500 people from around the world, the prize went to Keen, Roubini and Baker, all in Table 1. They,

Table 1. Anticipations of the Housing Crisis and Recession

Analyst	Capacity	Forecast
Dean Baker, United States	Co-Director, Center for Economic and Policy Research	"[P]lunging housing investment will likely push the economy into recession" (2006).
Wynne Godley, United States	Distinguished Scholar, Levy Economics Institute of Bard College	"The small slowdown in the rate at which U.S. household debt levels are rising resulting from the house price decline, will immediately lead to a . . . sustained growth recession . . . before 2010" (2006). "Unemployment [will] start to rise significantly and does not come down again" (2007).
Fred Harrison, UK	Economic Commentator	"The next property market tipping point is due at end of 2007 or early 2008 . . . The only way prices can be brought back to affordable levels is a slump or recession" (2005).
Michael Hudson, United States	Professor, University of Missouri	"Debt deflation will shrink the 'real' economy, drive down real wages, and push our debt-ridden economy into Japan-style stagnation or worse" (2006).
Eric Janszen, United States	Investor and <i>iTulip</i> Commentator	"The U.S. will enter a recession within years" (2006); "U.S. stock markets are likely to begin in 2008 to experience a 'Debt Deflation Bear Market'" (2007).
Stephen Keen, Australia	Associate Professor, University of Western Sydney	"Long before we manage to reverse the current rise in debt, the economy will be in a recession. On current data, we may already be in one" (2006).

(continued)

Table 1. Anticipations of the Housing Crisis and Recession (continued)

Analyst	Capacity	Forecast
Jakob Brøchner Madsen & Jens Kjaer Sørensen, Denmark	Professor & Graduate Student, Copenhagen University	"We are seeing large bubbles and if they burst, there is no backup. The outlook is very bad" (2005). "The bursting of this housing bubble will have a severe impact on the world economy and may even result in a recession" (2006).
Kurt Richebächer, United States	Private Consultant and Investment Newsletter Writer	"The new housing bubble - together with the bond and stock bubbles - will invariably implode in the foreseeable future, plunging the U.S. economy into a protracted, deep recession" (2001). "A recession and bear market in asset prices are inevitable for the U.S. economy . . . All remaining questions pertain solely to speed, depth and duration of the economy's downturn" (2006).
Nouriel Roubini, United States	Professor, New York University	"Real home prices are likely to fall at least 30% over the next 3 years" (2005). "By itself this house price slump is enough to trigger a U.S. recession" (2006).
Peter Schiff, United States	Stock Broker, Investment Adviser and Commentator	"[t]he United States economy is like the Titanic . . . I see a real financial crisis coming for the United States" (2006). "There will be an economic collapse" (2007).
Robert Shiller, United States	Professor, Yale University	"[F]urther rises in the [stock and housing] markets could lead, eventually, to even more significant declines . . . A long-run consequence could be a decline in consumer and business confidence, and another, possibly worldwide, recession" (2005).

and the other economists in that table except one, are (or were) analysts and commentators of global fame. They are a mixed company of academics, government advisers, consultants, investors, stock market commentators and one graduate student, often combining these roles. Already between 2000 and 2006 they warned specifically about a housing-led recession within years, going against the general mood and official assessment, and well before most observers turned critical from late 2007. Together they belie the notion that “no one saw this coming,” or that those who did were either professional doomsayers or lucky guessers.

In the remainder of this section we summarize the viewpoints of four of the Table 1 analysts. This selection reflects diversity both in the countries they commented upon and in their methodological background. Fred Harrison commenting on the UK situation, Jakob Brøchner Madsen and Jens Kjaer Sørensen on Denmark and the global housing bubble, and Kurt Richebächer on the U.S. credit markets. They are pluriform, as Harrison has published in the Georgist tradition, Richebächer wrote from an Austrian perspective, while Madsen does not clearly adhere to a specific methodological school. Sørensen’s work is informed by Minsky’s approach and hence perhaps best classified as Post-Keynesian. This diversity also holds for the entire set of analysts in Table 1, with the qualification that none is a mainstream economist. All are analyzing the evolution of financial institutions and their impact on society over time, with attention to organizational and historical detail and are, in this sense, operating in the Classical Institutional tradition. Importantly, although some are affiliated with mainstream institutions (Shiller is at Yale, Roubini at New York University, National Bureau of Economic Research and Center for Economic and Policy Research), all have distanced themselves in their writings from mainstream tenets such as rational individual optimization, the efficiency of financial markets or the irrelevance of financing methods (as in the Modigliani-Miller theorem). This common trait in itself is already a relevant finding, as it suggests that mainstream economics is unhelpful in anticipating financial instability and its implications. However, the aim of this paper is to go further and infer what, if anything, positively unites these contrarians.

The British Fred Harrison in his first book, *The Power in the Land* (1983), forecast the recessions in the leading industrial economies in 1992. In 2005 he published *Boom Bust*, warning that the property market is subject to a sharp downturn at the end of a regular 18-year cycle, based on Harrison’s study of UK property markets. At a time when the consensus among forecasters was that the boom in house prices would cool to an annual 2% or 3% rise over the following years, Harrison analyzed that a “winner’s curse” phase of the cycle would see UK home prices rise by more than 10% per annum – which they did over 2006 and 2007. An updated second edition of *Boom Bust* predicted that the next property market tipping point was due at end of 2007 or early 2008. The reason for the instability, Harrison explained, is not the housing market itself but the land market. Economic expansion encourages speculation, with banks lending more against escalating asset values and reinforcing the upward spiral. The only way land prices can be brought back to affordable levels is a slump or recession, undermining the banking system and causing widespread

unemployment and repossessions. The UK housing market started collapsing in November 2007, followed by the recession Harrison had forecast.

The Danish Jakob Brøchner Madsen is a professor of economics at Monash University in Australia. From 2003, while a professor in economics at the University of Copenhagen, he had questioned the sustainability of Denmark's growth. According to Madsen, Danes were living on borrowed time because of the mortgage debt, which "had never been greater in our economic history" (Agaard 2008, 3). The Danish business paper *Børsen* in its December 4, 2008 issue featured an overview of his forebodings. According to this (Agaard 2008), in 2003 Madsen wrote: "I am very pessimistic. We are heading into something that is worse than what we experienced in 1982 [the latest Danish recession, DJB]. It will be the worst recession since the Second World War." In 2004: "There is something completely wrong. We are seeing large bubbles and if they bust, there is no backup. House prices and shares are completely out of proportion. And it will go wrong. . . . The outlook is very bad for families in Denmark." In 2005: "I feel lost. Money growth is increasing, oil and commodity prices have doubled in the last 10 years. Therefore inflation and interest rates should increase, but nothing happens. All the models we use to predict inflation have broken down, it is chaos." (All quotes are from Agaard 2008, 3-4.)

Madsen's student, Jens Kjaer Sørensen wrote a MA thesis in 2005/2006 on "The Dynamics of House Prices – International Evidence" going back to the 1920s for a number of advanced economies (and to the 1840s for the Netherlands). In it, Sørensen demonstrated the existence of the first international synchronized housing boom in the UK, Norway, United States and the Netherlands. He showed that credit growth due to financial deregulation was the prime cause, and that it was a bubble, i.e., prices would inevitably fall sharply to their long-run trends. The bursting of this bubble "will have a severe impact on the world economy and may even result in a recession" (Sørensen 2006, 97).

Jacob Brøchner Madsen moved to Monash University in 2006. His farewell talk at the University of Copenhagen on July 1, 2006 was entitled "Anatomy of the Bubble-Bust Cycle in the Danish Housing Market." In 2007, Madsen observed that "houses are overvalued and it is only a matter of time before they will start falling" (Agaard 2008, 4). He predicted a decrease by up to 40%. According to *StatBank Denmark* data, the growth in family home prices in Denmark petered out in the third quarter of 2007, economic growth halved from 3.3% in 2006 to 1.6% in 2007 and the economy contracted by 1% in both 2008 and 2009.

Kurt Richebächer (1918-2007) wrote one of the longest-standing investment newsletters, the *Richebächer Letter* (e.g., Richebächer 2006a, 2006b, 2006c), which at various times also circulated as *Currencies & Credit Markets*. Richebächer was chief economist for Dresdner Bank from 1964 and moved into private consultancy in 1977. Bonner (2007) quotes him as warning against the bubble in technology stocks in the late 1990s. After its collapse, he warned against the bubble in housing, writing in September 2001: "the new housing boom is another rapidly inflating asset bubble financed by the same loose money practices that fuelled the stock market bubble" (Richebächer 2006c, 9). Richebächer went on to predict "that the housing

bubble – together with the bond and stock bubbles – will invariably implode in the foreseeable future, plunging the U.S. economy into a protracted, deep recession” (Bonner 2007).

Writing just before the turn of the U.S. housing market in the summer of 2006, Richebächer held that “the recovery of the U.S. economy since November 2001 has been dominated by an unprecedented consumer borrowing-and-spending-binge. . . . ‘wealth creation’ through soaring asset prices has been driven by ultra-cheap and loose money and credit, and not by saving and investment.” He commented that “[g]iven this precarious income situation on the one hand and the debt explosion on the other, it will be clear that in the foreseeable future there will be heavy selling of houses, with prices crashing for lack of buyers” (Richebächer 2006a, 11). As this prospect began to materialize in the next month, Richebächer wrote in his August 2006 newsletter that “a recession and bear market in asset prices are inevitable for the U.S. economy” (2006b, 1). “This will not be a garden-variety recession, in which monetary easing unleashes pent-up demand, as it used to do in past business cycles” (5). He again emphasized its cause: “the great trouble for the future is that the credit bubble has its other side in exponential debt growth (9). “The U.S. liquidity deluge of the last few years has had one single source: borrowing against rising assets backed by the Fed’s monetary looseness . . . all hinging on further rises in asset prices. But they are going to plunge” (1-12). And in September 2006 he wrote that “housing bubbles, when bursting, generally do considerable damage to the economy. Today, they are bound to do far more damage” (Richebächer 2006c, 4). The question was not if, but “how fast the U.S. economy and its asset markets will turn down” (9).

According to Bonner (2007), Paul Volcker, former Chairman of the U.S. Federal Reserve and a long-time friend of Richebächer, once remarked that the challenge for modern central bankers “is to prove Kurt Richebächer wrong.” Richebächer regarded the expansion of credit under Greenspan as laying the foundation of the worst post-World War II economic contraction. He died on August 24, 2007, two weeks after the events leading up to that contraction began (Bonner 2007).

Common Elements of Alternative Views

Surveying these assessments and forecasts, there appears to be a set of interrelated elements central and common to the contrarians’ thinking. This comprises a concern with financial assets as distinct from real-sector assets, with the credit flows that finance both forms of wealth, with the debt growth accompanying growth in financial wealth, and with the accounting relation between the financial and real economy. In the remainder of this section these issues will be discussed in turn.

A broadly shared element of analysis is the distinction between financial wealth and real assets. Several of the Table 1 commentators (Schiff and Richebächer) adhere to the “Austrian School” in economics, which emphasizes savings, production (not consumption) and real capital formation as the basis of sustainable economic growth. Richebächer (2006a, 4) warned against “wealth creation through soaring asset prices”

and sharply distinguishes this from “saving and investment” (where investment is in real-sector, not financial assets). Likewise, Shiller (2003) warns that our infatuation with the stock market (financial wealth) was fuelling volatility and distracting us from the more durable economic prospect of building up real assets. Hudson (2006a) comments on the unsustainable “growth of net worth through capital gains.”

A concern with debt as the counterpart of financial wealth follows naturally. “The great trouble for the future is that the credit bubble has its other side in exponential debt growth” wrote Richebächer (2006b, 1). Madsen (2003) worried that Danes were living on borrowed time because of the mortgage debt which “had never been greater in our economic history.” Godley and Zezza (2006) demonstrated the U.S. economy’s dependence on debt growth. They argued it would plunge the United States into a “sustained growth recession . . . somewhere before 2010” (3). In Schiff (2007) he pointed to the low savings rate of the United States as its worst malady, citing the transformation from being the world’s largest creditor nation in the 1970s to the largest debtor nation by the year 2000. Hudson (2006a, 107) emphasized the same ambiguous potential of house price “wealth” already in the title of his 2006 *Saving, Asset-Price Inflation, and Debt-Induced Deflation*, where he identified the “large debt overhead – and the savings that form the balance-sheet counterpart to it” as the “anomaly of today’s [U.S.] economy.” He warned that “[r]ising debt-service payments will further divert income from new consumer spending. Taken together, these factors will further shrink the ‘real’ economy, drive down those already declining real wages, and push our debt-ridden economy into Japan-style stagnation or worse” (Hudson 2006b, 46). Janszen (2009) noted how he had written that “U.S. households and businesses, and the government itself, had since 1980 built up too much debt. The rate of increase in debt was unsustainable . . . Huge imbalances in the U.S. and global economy developed for over 30 years. Now they are rebalancing, as many non-mainstream economists have warned was certain to happen sooner or later.” Keen (2006) wrote that the debt-to-GDP ratio in Australia (then 147 percent) “will exceed 160 percent of GDP by the end of 2007. We simply can’t keep borrowing at that rate. We have to not merely stop the rise in debt, but reverse it. Unfortunately, long before we manage to do so, the economy will be in a recession.”

These quotes already reflect a further concern, that growth in financial wealth and the attendant growth in debt can become a determinant (instead of an outcome) of economic growth, undermining its sustainability and leading to a downturn. There is a recurrent emphasis home equity-fuelled consumption has in recent years sustained stable growth (especially in the United States and UK) more than anything else, and that this was dangerous. Harrison (2007) juxtaposed his view to those who “assume that the health of the property market depends upon the condition of the rest of the economy. In fact, . . . property is the key factor that shapes the business cycle, not the other way around.” Baker (2002) wrote that “[w]hile the short-term effects of a housing bubble appear very beneficial – just as was the case with the stock bubble and the dollar bubble – the long-term effects from its eventual deflation can be extremely harmful.” Godley and Wray (2000) argued that stable growth in the United States was unsustainable, as it was driven by households’ debt growth, in turn

fuelled by capital gains in the real estate sector. Their view was that as soon as debt growth slowed down – as it inevitably would within years – growth would falter and recession set in.

This recessionary impact of the bursting of asset bubbles is also a shared view. The bursting of the international housing bubble was seen to have “a severe impact on the world economy and may even result in a recession” (Sørensen 2006, 97). Richebächer (2006a, 4) in July 2006 commented that “[t]he one thing that still separates the U.S. economy from economic and financial disaster is rising house prices that apparently justify ever more credit and debt” and in August 2006 that “a recession and bear market in asset prices are inevitable for the U.S. economy.” Again, “[t]here is no question that the U.S. housing bubble is finished. All remaining questions pertain solely to speed, depth and duration of the economy’s downturn” (Richebächer 2006c, 9). Roubini (2006), on August 23, 2006 – only weeks after U.S. house prices had started falling – already wrote that “[b]y itself this [house price] slump is enough to trigger a U.S. recession.”

Finally, emphasis on the role of credit cycles in the business cycle leads to a long-term view on credit cycles. Sørensen (2006) criticizes most housing market analyses for not looking beyond the 1980 to 2000 time period. These were the years of a credit boom, and only by looking at longer periods can the dynamics and dangers of the housing market be detected, he demonstrates. Also others place the long credit boom that started in the mid 1980s as central to understanding economic performance, and assert that acceleration of growth in lending and debt has endangered stability since. The assessment of the 2007/2008 collapse is so embedded in a longer-term view. Baker (2002) already argued that the early 2000s recovery was fueled by a housing bubble, just as the late 1990s cycle was fueled by a stock bubble. Accordingly, U.S. economic growth since the 2000 dotcom crash, is viewed by several as “phony” growth in that it was (consciously or unwittingly) engineered by the monetary authorities via generous credit policies, rather than driven by real-sector performance.

Comparing the Paradigms

How did the analysts discussed above distinguish themselves from mainstream economics? A foundational issue, from which more specific differences follow, is the organizing principle of market equilibrium induced by firms and households acting as rationally optimizing economic agents. In contrast to this feature of models used for official forecasts, the models used by the contrarians – whether formalized or not – have an emphasis on money, the flow of funds and accounting relations in the economy, on the role of uncertainty, and on economic psychology and political economy as the key behavioral assumptions. Absence of the notion of equilibrium does not mean that their models are indeterminate. Some do have steady states (Godley 1999) and the logical implications of flow-of-funds models such as those used by Godley et al. (2007) are determinate – in some respects more so than those of equilibrium models, as will be discussed below.

All of these analysts reject rational equilibrium on the basis of arguments related to economic psychology and to the Keynesian notion of “radical uncertainty” (as opposed to calculable risks). Keen, in an article titled “Finance and Economic Breakdown” explained that

Keynes argued that uncertainty cannot be reduced to “the same calculable states as that of certainty itself” whereas the kind of uncertainty that matters in investment is that about which “there is no scientific basis on which to form any calculable probability whatever. We simply do not know” (1995, 610).

According to Keen, Keynes argued that in the midst of this incalculable uncertainty, investors form fragile expectations about the future, which are crystallized in the prices they place upon capital sets, and that these prices are therefore subject to sudden and violent change.

This view of human assessment and investment behavior allows for a crisis of confidence in a way that equilibrium models – where investment is always guided by the marginal costs and benefits of underlying real capital assets – cannot. This possibility, in turn, allowed the above analysts to contemplate the plausibility that the general mood is not rational but mistaken, and that crisis looms amidst seemingly tranquil conditions.

Specifically, housing market participants in a credit boom are viewed as led to speculation by psychological mechanisms well known in a bull market. Harrison (2005) observes that economic expansion encourages a speculation mentality, with banks lending more against escalating asset values and reinforcing the upward spiral. Shiller (2000, 2008) writes of the contagion effect as the principal mechanism feeding bubbles. Beliefs about wealth creation through asset prices spread via a number of mechanisms such as “new era” stories that justify the capital gains as being part of a “new economy,” where the novel aspect resides in, for instance, technology (in the 1990s) or globalization (in the 2000s). Shiller (2000) has articulated motivational models of human behavior such as “irrational exuberance,” which allow for states of the economy such as euphoric booms, busts, and recession – all of which are difficult to grasp in the conventional models. Other authors refer to related ideas as developed by Minsky (1978). Sørensen (2006) similarly explains the housing bubble by information cascades and herding behavior, where investors observing gainful speculation are more likely to engage in speculation, regardless of the underlying fundamentals.

As to political economy, the boom was seen to be fuelled by monetary policies of generous credit flows and low interest rates and the un-taxing of real estate gains via depreciation and interest payments tax rules. These policies are observed to have helped stave off (intended or otherwise) recession after the 1999 dotcom collapse, even though in fostering a wealth-cum-debt bubble they stored up the 2007-2008 trouble. Janszen (2001) “expected that after the technology bubble crash the Federal Reserve and government was certain via tax cuts, rate cuts, and stealth dollar

devaluation to induce a reflation boom like the 1934-1937 reflation created after the 1929 stock market bubble bust.” Richebächer (2006a, 4) writes of “ultra-cheap and loose money and credit,” and that “[t]he U.S. liquidity deluge of the last few years has had one single source: borrowing against rising assets backed by the Fed’s monetary looseness” (Richebächer 2006b, 9).

This underlying difference with the neoclassical equilibrium assumption finds expression in the way models are structured. Models of the macro economy (of either type) consist of equations of two sorts: identities describing per-definition relations between variables, and behavioral equations capturing assumptions about decisions by economics agents on saving, investment, borrowing, lending, employment, and transactions. In equilibrium models, the action is in the behavioral assumptions, which drive model responses to shocks and determine performance forecasts. The typical behavioral assumption is individual optimization by economic agents of their objective function (consumption for households; profit for firms) to some equilibrium level.

Unlike equilibrium models, the equations in flow-of-funds models such as those used by Godley (1999) represent a transactions (flow) matrix and a balance sheet (stock) matrix. Thus, the flow of funds is at the very heart of these models, unlike the mere unit-of-account function of money in equilibrium models. Explicit flow-of-funds models, such as those developed not only by Godley (1999) but also Godley and Lavoie (2007a), Graziani (2003), Hudson (2006b) and Keen (2006), are grounded in the “endogenous money” view of the economy, where banks’ credit creation is viewed as central and indispensable for transacting and thus for economic activity at large. Levels of wealth and debt are recognized to affect banks’, firms’ and the public’s balance sheets, and thus economic activity. The contrast is with neoclassical economics on which equilibrium models are based, where wealth plays no (or only a small) role and money is incidental to the economic process, which is seen as driven by real-sector fundamentals. This emphasis on financial balance sheets and the monetary nature of the economy is what distinguishes flow-of-funds models from input-output models, which describe flows of goods and services perhaps denominated in money terms, but without finance and the flow of funds that it generates playing a role in the model dynamics. For instance, “[f]lows of interest are not often discussed in the literature, although a model of the whole system cannot be solved unless they are explicitly included” (Godley 1999, 397).

As to behavioral equations, equating of marginal cost and revenue as the leading principle would be inconsistent with the radical uncertainty theorized by Keynes. This implies that firms are in a state of uncertainty over future sales and revenues and do not even know their precise objective function, let alone have the computing power to continually solve it, as in neoclassical theory. Hence, firms cannot respond to future prices while planning future production. Rather, firms may be assumed to respond to sold quantities, via changes in their inventories.

The introduction of uncertainty, and the absence of maximizing to a single optimum, likewise shapes the behavioral assumptions on households and the government. For instance, in Godley’s approach households are assumed to hold

wealth in a number of assets, allocating over assets according to their expected returns. Consumption, in turn, depends on these wealth holding preferences as well as income. As expectations can be volatile, “when unexpected things happen, these assets move in correspondingly unexpected ways” (Godley 1999, 397), and so does consumption, demand, and the wider economy. They depend, not on some equilibrium condition, but on how flows of funds and goods adjust to changes in stocks. Changes in this theoretical system therefore can be much more abrupt. Economy-wide crisis resulting from perceptions and wealth changes is possible.

As to underlying model philosophy, “a model, of necessity, is an abstraction from the full detail of the real world,” as Greenspan (2008) reminded his readers and himself after the crash. Flow-of-funds models (whether formalized or not) differ from equilibrium models in what they abstract from. Equilibrium models abstract from the flow of funds and the stocks of credit and debt, and the systemic risks implied in them; they focus on the individual optimization problems facing individuals. It is assumed that any impact of the flow of funds and the stocks of credit and debt are fully reflected in returns and risks at the individual level, so that this is what analysis needs to focus on. In contrast, flow-of-funds models abstract from optimization problems and focus on the flow of funds and the stocks of credit and debt. The assumption is that individual decisions will always be reflected in the aggregate flow of funds and the stocks of credit and debt, and that this is where an economy’s rate of return and systemic risks are formed; and so that this is what a model needs to chart.

But when Greenspan (2008) wrote that “we will never have a perfect model of risk,” he meant individual-level, not systemic risk. His (and the mainstream) view is that systemic analysis is not valid scientifically without an individual-level underpinning (“micro fundamentals”), and is redundant with it – in sum, systemic analysis is ruled out. “He espoused the idea that mathematical econometric models of individual behavior are the only tools we will ever have” (Shiller 2008, 42). This contrasts to the analyses discussed in the third section, which are all on the level of the economic system, not the individual.

Relatedly, an important difference between equilibrium models and flow-of-fund models (used explicitly by Godley and Keen and implicitly by Hudson and Richebächer) is that identity equations in a flow-of-funds model aim to reflect the flow of funds in the economy in a complete (though obviously stylized) manner. It is specified where each flow of funds comes from and where it goes. Each transaction is by some sector to some other sector (both well specified) and leads to two equal changes in balance sheets. In contrast, equilibrium models do not aim at such completeness. For instance, an increase in the money supply in a flow-of-funds model is reflected in changes in the accounts of banks and lenders, whereas an increase in the money supply in the typical macroeconomic model simply is an increase in the value of the money stock (M2 or M3 or M4) *ex nihilo*; the actual money creation process, and the accompanying flow of funds (principal and interest payments) is not specified. Thus, conventional equilibrium models tend to be detailed on hours worked, productivity, and the like, but completely miss trends in variables such as debt buildup.

Finally, in equilibrium models, solving the optimization problems is what determines the model outcome. In flow-of-funds models, its completeness drives the outcome. For instance, in flow-of-funds models including a private sector (firms and households), a government sector and a foreign sector, Godley and Lavoie (2007b, xxxvi) note the “strategic importance” of the “accounting identity which says that, measured in current prices, the government’s budget deficit less the current account deficit is equal, by definition, to private saving minus investment.” This identity allowed Godley and Wray (2000) to conclude that “Goldilocks was doomed”: with a government surplus and current account deficit, U.S. economic growth had to be financed by private debt growth. Equilibrium models do not permit for such determinate conclusions.

Summary, Reflections and Conclusions

This paper has sought to contribute to the debate on what economics can learn from the credit crisis and recession. It asks what are the elements in the mainstream paradigm that caused many economists to misjudge the state of the economy so dramatically in the years leading up to the 2007 credit crisis and the 2008/2009 recession? It applied a factual, inductive approach by scrutinizing the work of twelve economists who warned of the crisis, and to identify the common elements in their thinking. These are then contrasted to mainstream thinking.

Those who “saw it coming” in their analyses emphasized financial assets, debt, and the flow of funds. These are elements absent from most forecasting and scenario evaluation models in official use (e.g., DSGE models). Regarding behavioral assumptions, these include uncertainty, bounded rationality and non-optimizing behavior, also in contrast to mainstream theory. Methodologically, these analysts favor empirical work rather than theoretical formalism, and they share an aversion to methodological individualism. In summary, neoclassical economists should stop neglecting money, wealth and debt, and turn away from an individualistic and toward a systemic view of the economy.

These are not shockingly novel findings: they have been discussed extensively in the heterodox literature. This paper contributed a corroboration of those concerns based not on theoretical considerations, but on a factual investigation of what “works” in terms of crisis anticipation. The straightforward conclusion is that mainstream theory should start paying attention to these elements if it is to be more successful in anticipating financial instability when “it” happens again (Minsky 1982). The problem will be that most of these elements are incompatible with core tenets of the neoclassical paradigm. In personal communications and at seminar presentations of this paper, officials from central banks and forecasting agencies have often asserted that a monetary module is being added to their models, addressing the concerns raised here. This may be true for some issue such as ignoring or tracing the size (if not the impact) of debt. But when it comes to fundamental choices such as equilibrium solutions or taking a systemic or individualistic perspective, the question is not how they can best match. They are incompatible. Therefore, following Kuhn’s (1962) view

on scientific revolutions, it is more likely that the credit crisis and recession will result in added effort in the construction of theoretical “protective belts” rather than modification of economics’ theoretical core. The continuing challenge for heterodox economists will be to develop and publicize a more realistic kind of economics. In addressing this task for the field of monetary economics and macrofinancial stability, there are solid foundations to be built on, as this paper has sought to demonstrate.

Appendix

The Table 1 list is not intended as exhaustive or even final. In this Appendix, I briefly discuss some other possible candidates for the list of those who “saw it coming.”

Some warnings were publicly available at about the time of the crisis. For instance, Mike Stathis (2007) and Michael Panzner (2007) both warned about excessive consumer, corporate and government debt and about the spread of instruments like derivatives. They are less clear on the mechanism of the collapse, with Stathis’s linking together issues as diverse as U.S. health care, social security, the trade deficit, immigration, peak oil, and debt.

Some other warnings were clear and timely but not specific. Bank of International Settlements economist Claudio Borio warned that “contrary to conventional wisdom, the growth of markets for tradable instruments, and hence the greater scope to sell assets and raise cash, need not have reduced the likelihood of funding (liquidity) crises” (2004). His colleague William White went further and in 2006 wrote that “[o]ne hopes that it will not require a disorderly unwinding of current excesses to prove convincingly that we have indeed been on a dangerous path,” as quoted by Balzli and Schliessl (2009). And in August 2005, University of Chicago professor and the IMF Director of Research Raghuram Rajan, delivered a paper called “Has Financial Development Made the World Riskier?” at the annual Jackson Hole gathering of Federal Reserve and other influential economists. He argued that financial developments during Alan Greenspan’s 18-year tenure had not made the world safer but riskier, and that disaster might loom. This was highly controversial and he was politely ridiculed (Lahart 2009). While all these warnings were unprecedented in the central banking environment in which they were made, compared to the Table 1 analysts they were not very specific about the mechanism and the timing of the coming crash. This is also true of some other widely respected economists such as Martin Feldstein and Joseph Stiglitz.

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