"No One Saw This Coming": Understanding Financial Crisis Through Accounting Models

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ABSTRACT (78 words)

This paper presents evidence that accounting (or flow-of-fund) macroeconomic models helped anticipate the credit crisis and economic recession. Equilibrium models ubiquitous in mainstream policy and research did not. This study identifies core differences, traces their intellectual pedigrees, and includes case studies of both types of models. It so provides constructive recommendations on revising methods of financial stability assessment. Overall, the paper is a plea for research into the link between accounting concepts and practices and macro economic outcomes.

Keywords: credit crisis, recession, prediction, macroeconomics, flow of funds, financialization, neoclassical economics, accounting research

* This papers has benefited from conversations with (in alphabetical order) Arno Mong Daastoel, Geoffrey Gardiner, Michael Hudson, Gunnar Tomasson and Richard Werner.

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"No One Saw This Coming"

Understanding Financial Crisis Through Accounting Models

"She was asking me if these things are so large, how come everyone missed it?"

Luis Garicano on the Queen's visit to LSE, November 2008

"The financial crisis will hopefully stimulate a revival of accounting scholarship aimed at understanding the relationship between accounting practice and the macro political and economic environment in which it operates."

Patricia Arnold, June 2009

1. Introduction

On March 14, 2008, Robert Rubin spoke at a session at the Brookings Institution in Washington, stating that "few, if any people anticipated the sort of meltdown that we are seeing in the credit markets at present". Rubin is a former US Treasury Secretary, member of the top management team at Citigroup bank and one of the top Democratic Party policy advisers. On 9 December of that year Glenn Stevens, Governor of the Reserve Bank of Australia commented on the "international financial turmoil through which we have lived over the past almost year and a half, and the intensity of the events since mid September this year". He went on to assert: "I do not know anyone who predicted this course of events. This should give us cause to reflect on how hard a job it is to make genuinely useful forecasts. What we have seen is truly a 'tail' outcome – the kind of outcome that the routine forecasting process never predicts. But it has occurred, it has implications, and so we must reflect on it" (RBA 2008). And in an April 9, 2009 lecture Nout Wellink - chairman of the Basel Committee that formulates banking stability rules and president of the Dutch branch of the European Central Bank - told his audience that "[n]o one foresaw the volume of the current avalanche".

These are three examples of the idea that 'no one saw this coming'. This has been a common view from the very beginning of the credit crisis, shared from the upper echelons of the global financial and policy hierarchy and in academia to the general public. It continues to be publicised, as documented in more detail in the next section. And yet it would be premature to ask "Why did

nobody notice?", as Queen Elizabeth did as she inaugurated a new building at the London School of Economics in November 2008[1]. Contrary to Governor Stevens' assertion, it is not difficult to find predictions of a credit or debt crisis in the months and years leading up to it, and of the grave impact on the economy this would have - not only by pundits and bloggers, but by serious analysts from the world of academia, policy institutes, think tanks and finance. The starting point for the present study is that there is something to be learned from this observation – or, in the words of Governor Stevens, "it has occurred, it has implications, and so we must reflect on it". To do precisely that is the aim of this paper.

The credit crisis and ensuing recession may be viewed as a 'natural experiment' in the validity of economic models. Those models that failed to foresee something this momentous may need changing in one way or another. And the change is likely to come from those models (if they exist) which did lead their users to anticipate instability. The plan of this paper, therefore, is to document such anticipations, to identify the underlying models, to compare them to models in use by official forecasters and policy makers, and to draw out the implications.

There is an immediate link to accounting, organizations and society. Previewing the results, it will be found that 'accounting' (or flow-of-funds) models of the economy are the shared mindset of those analysts who worried about a credit-cum-debt crisis followed by recession, before the policy and academic establishment did. They are 'accounting' models in the sense that they represent households', firms' and governments' balance sheets and their interrelations. If society's wealth and debt levels reflected in balance sheets are among the determinants of its growth sustainability and its financial stability, such models are likely to timely signal threats of instability. Models that do not – such as the general equilibrium models widely used in academic and Central Bank analysis – are prone to 'Type II errors' of false negatives – rejecting the possibility of crisis when in reality it is just months ahead. Moreover, if balance sheets matter to the economy's macro performance, than the development of micro-level accounting rules and practices are integral to understanding broader economic development. This view shows any clear dividing line between 'economics' and 'accounting' to be artificial, and on the contrary implies a role for an 'accounting of economics' research field. Thus this paper aims to encourage accountants to bring their professional expertise to what is traditionally seen as the domain of economists - the assessment of financial stability and forecasting of the business cycle.

[1] Her question was directed at LSE Professor Luis Garicano, who responded: "At every stage, someone was relying on somebody else; and everyone thought they were doing the right thing." (Pierce, 2008)

With a few exceptions, this point seems to have been overlooked to date. The dominant response in the wake of the credit crisis in the accountants and auditors community has been to re-examine accounting regulations such as 'fair-value' accounting (Boyer, 2007; Laux and Leuz 2009), mark-to-market accounting, lax auditing practices, and the like; or to ask how accounting models can reflect what has happened (Roberts and Jones, 2009). It is important to stress from the outset that the present paper aims to make an entirely different point. While it is topical in that it examines the recent credit crisis, its key argument is relevant beyond this episode. This study is fundamentally about how accounting as a discipline relates to business studies and economics – especially, macro economics. It is a response to the call by Arnold (2009) in this Journal to examine "our failure to understand the linkages between micro accounting and regulatory technologies, and the macroeconomic and political environment in which accounting operates", and "to provide solutions". It is likewise a response to the need identified by Hopwood (2009) to "explore the interface between accounting and finance". This paper does not itself report on such exploration, but it aims to develop a framework that shows the need for such more detailed accounting research. The argument of this study is that recognizing the accounting forms in which economic (including financial) relations of necessity exist, is important – perhaps even indispensible – for understanding the economic and financial system's sustainability, and whether there is a financial crisis looming. This thesis will be developed along the following lines.

In the next two sections the results of the 'fieldwork' of this research are presented. Section 2 briefly documents the sense of surprise at the credit crisis among academics and policymakers, giving rise to the view that 'no one saw this coming'. Section 3 (and the Appendix) is a careful survey – applying a number of selection criteria - of those professional and academic analysts who did 'see it coming', and who issued public predictions of financial instability induced by falling real estate prices and leading to recession. The common elements in their analyses are identified, including an 'accounting' view of the economy. In section 4 the structure of accounting (or flow-of-funds) models underlying some of the most explicit of these predictions is explored. Section 5 in turn describes and explores the mainstream alternative of 'equilibrium' models used by official national forecasters and international bodies such as the EU, OECD and IMF. Section 6 is a systematic comparison of the two types of models and their underlying views and section 7 reflects on their theoretical pedigrees. The final section summarizes the arguments and evidence of this paper, reflects on the implications, and points to opportunities for fruitful follow-up research.

2. 'No one Saw This Coming'

The view that "[n]o one foresaw the volume of the current avalanche" appears justified by a lack of discussion, in the academic and policy press, of the possibility that financial globalization harboured significant risks, or that the US real estate market and its derivative products were in dangerous waters. Wellink (2009) quoted a 2006 IMF 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 policy makers, academics, and the business community. The following examples illustrate.

In an October 12, 2005 speech to the National Association for Business Economics, the 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 on increased 'resilience', Greenspan had in February 2005 asserted the US 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 "[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 eliminates 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 (p.1) "there is little systematic evidence to support widely cited claims that financial globalization by itself leads to deeper and more costly crises."

As to the business community, Landler (2007, 2008) reports that Klaus-Peter Müller, head of the New York branch of *Commerzbank* 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." Josef Ackermann, CEO of *Deutsche Bank*, likewise remembers a July 2007 luncheon

attended by chief executives of leading banks, political leaders, and senior Federal Reserve officials to discuss the looming risks to the financial system, on which the deepening woes in the subprime mortgage market did not figure high on the agenda: "We clearly underestimated the impact", said Ackermann.

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. *USA Today* in December 2006 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 in the *Financial Times* 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 (2008) 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.

3. Common Elements of an Alternative View

Despite appearances, this mainstream view was not the only serious *ex ante* assessment. An alternative, less sanguine interpretation of financial developments was publicized, and it was not confined to the inevitable fringe of bearish financial commentators. In this section serious analysis and public predictions of financial instability induced by falling real estate prices and leading to recession are documented.

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 an extensive search of the relevant literature, four selection criteria were applied. Only analysts were included who provide some account on how they arrived at their conclusions. Second, the analysts included went beyond predicting a real estate 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 - as detailed in the Appendix - so that the final selection is truly the result of critical scrutiny.

Descriptions of these analysts and their assessment are relegated to an Appendix. A summary overview is presented in Table 1. The twelve analysts described there - the number is entirely an outcome of the selection criteria - commented on the US, UK, Australian, Danish and global conditions in housing, finance and the broader economy. All 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.

But there is a more important, constructive contribution. An analysis of these cases allows for the identification of any common underlying analytical framework, which apparently helps detect threats of instability. 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.

Table 1: Anticipations of the Housing Crisis and Recession

Analyst	Capacity	Forecast
Dean Baker, US	co-director, Center for Economic and Policy Research	" …plunging housing investment will likely push the economy into recession." (2006)
Wynne Godley, US	Distinguished Scholar, Levy Economics Institute of Bard College	"The small slowdown in the rate at which US household debt levels are rising resulting form 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, US	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, US	investor and *iTulip* commentator	"The US will enter a recession within years" (2006). "US 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)
Jakob Brøchner Madsen & Jens Kjaer Sørensen, Denmark	professor & graduate student, Copenhagen University	"We are seeing large bubbles and if they bust, 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, US	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, US	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 US recession." (2006)
Peter Schiff , US	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 , US	professor, Yale University	"There is significant risk of a very bad period, with rising default and foreclosures, serious trouble in financial markets, and a possible recession sooner than most of us expected." (2006)

Note: for sources and more detail, please refer to the Appendix.

A broadly shared element of analysis is the distinction between financial wealth and real assets. Several of the commentators (Schiff and Richebächer) adhere to the 'Austrian School' in economics, which means that they emphasize savings, production (not consumption) and real capital formation as the basis of sustainable economic growth. Richebächer (2006a:4) warns against ""wealth creation" though 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) is fuelling volatility and distracting us from more the 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" writes Richebächer (2006b:1). Madsen from 2003 worried that Danes were living on borrowed time because of the mortgage debt which "had never been greater in our economic history". Godley in 2006 published a paper titled *Debt and Lending: A Cri de Coeur* where he demonstrated the US economy's dependence on debt growth. He argued it would plunge the US into a "sustained growth recession … somewhere before 2010" (Godley and Zezza, 2006:3). Schiff points 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) emphasized the same ambiguous potential of house price 'wealth' already in the title of his *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 [US] 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). Janszen (2009) wrote that "US 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 US 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 per cent) "will exceed 160 per cent 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 (e.g. Baker 2007), that home equity-fuelled consumption has in recent years sustained stable growth (especially in the US 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 US 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." Aagain, "[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 on August 23, 2006 - only weeks after US house prices had started falling - already wrote that "[b]y itself this [house price] slump is enough to trigger a US recession."

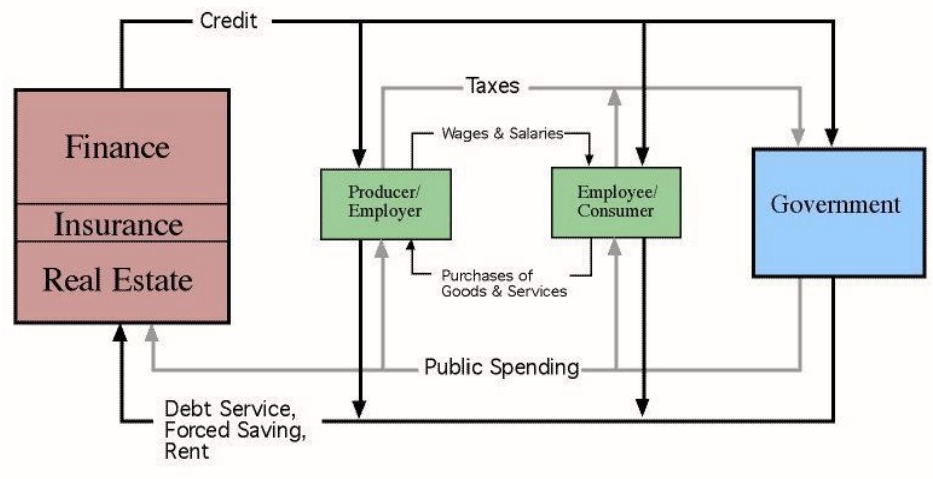
Finally, emphasis on the role of credit cycles in the business cycle leads to a long-term view on credit cycles. Sørensen criticizes most housing market analyses for not looking beyond the 1980s-2000s period. These were the years of a credit boom, and only by looking at longer periods can the dynamics 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 2007-8 collapse is so embedded in a longer-term view. "This recovery has been fueled by a housing bubble, just as the late 90s cycle was fueled by a stock bubble," commented Baker. Accordingly, US 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.

4. Accounting Models of the Economy

The above concerns with wealth, debt, and credit flows can be summarized in saying that the above authors take an 'accounting' or 'flow-of-funds' view of the economy. This is most explicit with Keen (2006), Hudson (2006a, 2006b), and especially Godley (1999; also, Godley and Lavoie 2007), who each actually present explicit accounting models of the economy. Key features of such models include (a) the circular flow of goods and money, (b) a separate representation of stocks (inventories, wealth and debt) and flows (goods, services and funds), (c) explicit modelling of the financial sector as distinct from the real economy, so allowing for independent growth and contraction effects from finance on the economy, (d) non-optimising behaviour by economic agents in an environment of uncertainty, and (e) accounting identities (not the equilibrium concept) as determinants of model outcomes in response to shocks in the environment or in policy. These features are graphically captured in Figure 1 taken from Hudson (2006b), which depicts an economy (simplified, without foreign sector) viewed through a flow-of-funds prism. Similar 'circuitist' representations may be found in theoretical work by Rochon (1999) and Graziani (2003).

This section discusses how those elements of 'accounting' or 'flow-of-funds' models are central in understanding the determinants of (and boundaries to) the economy's growth and its likelihood of entering into a debt-driven recession. The significance of studying these models is also in identifying the differences with conventional policy models, discussed in the next section. Juxtaposing the two approaches of 'accounting' versus 'equilibrium' models may help understand why 'no one saw this coming' among users of equilibrium models, while some others using accounting models did. Further, conceptualizing both types of theories is one way to identify entry points for "accounting's engagement with political economy" which "can be defined more broadly to include any non-neoclassical economic framework for understanding the economy and accounting's relationship to it." (Arnold 2009). Flow-of-fund models, and their underpinnings taken from psychology and political economy, are among these non-neoclassical economic frameworks.

Figure 1: Schematic Overview of Flow-of-fund Models



Source: Hudson (2006b)

The finance, insurance and real estate (FIRE) sector includes all sorts of wealth-managing nonbank firms (pension funds, insurers, money managers, merchant banks, real estate agents etc.), as well as deposit-taking banks, which generate credit flows. It is conceptually separate from the real sector which comprises government, firms and households. Liquidity from the FIRE sector flows to firms, households and the government as they borrow. It facilitates fixed-capital investment, production and consumption, the value of which - by accounting necessity - is jointly equal to real-sector income in the form of profit, wages and taxes plus financial investment and obligations (principally, interest payments). Funds so originate in the banking part of the FIRE sector and either circulate in the real economy, or they return to the FIRE sector as financial investments or in payment of debt service and financial fees. Total credit flows (in nominal currency units) are normally increasing year on year, reflecting positive profit and interest rates.

Thus, there is a trade-off between the financing of production (out of retained earnings and fresh lending) on the one hand, and credit flows returning into the financial sector on the other. This trade-off is absent from the mainstream models and debate, but is crucial to understanding crisis, according to Friedman (2009): "an important question—which no one seems interested in addressing—is what fraction of the economy's total returns … is absorbed up front by the financial industry." Below is a detailed examination of how this neglected question matters.

Another presentation of flow-of-fund-models, which is especially suited to bring out their accounting nature, is in matrix form. Figure 2 presents the matrix of flows of transactions of the Godley (1999) model. Figure 3 presents the stocks in balance sheets, by sector.

Figure 2: The Flow of Funds in Matrix Representation

	Households	Firms current	Firms capital	Banks current	Banks capital	Govt.	Row sum
Consumption	$-C$	$+C$					0
Govt. expenditure		$+G$				$-G$	0
[Sales]		$[S]$					
Change in the value of inventories		$+\Delta I$	$-\Delta I$				0
Tax		$-T$				$+T$	0
Wages	$+WB$	$-WB$					0
Profits	$+F$	$-Ff$		$-Fb$			0
Interest on loans		$-rl.L_{-1}$		$+rl.L_{-1}$			0
Interest on money	$+rm.M_{-1}$			$-rm.M_{-1}$			0
Interest on bills	$+rb.Bsp_{-1}$			$+rb.Bsb_{-1}$		$-rb.Bs_{-1}$	0
Interest on bonds	$+B_{-1}$					$-B_{-1}$	0
Stock of cash	$-\Delta Hp$				$-\Delta Hb$	$+\Delta H$	0
Stock of current deposits	$-\Delta Mn$				$+\Delta Mn$		0
Stock of demand deposits	$-\Delta M$				$+\Delta M$		0
Stock of bills	$-\Delta Bsp$				$-\Delta Bsb$	$+\Delta Bs$	0
Stock of bonds	$-\Delta B.pb$					$+\Delta B.pb$	0
Stock of loans			$+\Delta L$		$-\Delta L$		0
Column sum	0	0	0	0	0	0	0

Source: Godley (1999:395)

Figure 3: Macro Balance Sheets in Matrix Representation

	Households	Firms	Banks	Government	Balance
Inventories		+I			-I
Cash	$+Hp$		$+Hb$	$-H$	
Demand deposits	$+Mn$		$-Mn$		
Time deposits	$+M$		$-M$		
Bills	$+Bsp$		$+Bsb$	$-Bs$	
Bonds	$+B.pb$			$-B.pb$	
Loans		$-L$	$+L$		
Balance	-V			$+DG$	+I

Note: V = household wealth; DG = total government liabilities. 'Bonds' are perpetuities each paying one unit of currency per period so the price of a bond (pb) is the reciprocal of the interest rate. A change in the value of the stock of bonds between two periods has two components: $\Delta B.pb$ and $\Delta pb.B_{-1}$. The first term describes the value of transactions in bonds, the second describes the capital gain resulting from a change in the bond price. Columns and rows all sum to zero.

Source: Godley (1999:395)

Like the Figure 1 representation of a flow-of-funds model taken from Hudson (2006a), the Godley (1999) model consists of four sectors, explicitly separating out the financial sector, with their properties and interrelations represented in over 60 equations. It reflects Keynesian uncertainty (on which more in section 6) by including 'expected' values of, for instance, inventories. Other important elements in common with Figure 1 are the centrality of bank credit flows, since "evolving finance in the form of bank loans is required if production is to be financed in advance of sales being made and if profit is to be extracted from firms and paid over to households" (Godley, 1999:405). Yet another element is explicitly including payment flows such as interest payments, "not quite the same as in the national accounts, where it is standard practice… to ignore interest payments, although they are an inevitable cost given that production takes time" (Godley, 1999:405).

Godley (1999:394) explains that: "[e]ach row and column of the flow matrix sums to zero on the principle that each flow comes from somewhere and goes somewhere. The financial balance of each sector – the gap between its income and its expenditure reading vertically [in Figure 2] – is always equal to the total of its transactions in financial assets." The model reflects changes in the value of financial stocks, in inventories, and in household wealth. Because of the accounting equalities, this is equal to the sum of government debt and inventories (reading horizontally at the foot of Figure 3). The "watertight accounting of the model implies that there will always be one equation which is logically implied by the others" (Godley 1999:395).

How did the structure of flow-of-fund models allow their users to distinguish between financially sustainable and unsustainable growth, and so to anticipate a credit-cum-debt crises? Consider the reasoning, along the following lines. A benchmark scenario of financially sustainable growth is when the economy expands with constant fractions of it credit flows going to the financial and real sectors. Debt burdens do not grow as proportion of the real economy and therefore remain serviceable, and the FIRE sector cannot have a bad loan problem. Conversely, debt growth is the central factor in undermining the financial sustainability of economic growth. Of all possible configurations of behaviour in the Godley model, only a default on debt can "unbalance the banks' consolidated balance sheet" Godley (1999: 397).

Conditions for such default may develop as, different from the benchmark scenario, financial expansion or financial innovation occurs. This may be driven by the real economy requiring more of its wealth to be managed in financial instruments and assets, or because of the need for new financial instruments responding to changed needs to save, to invest and to smooth consumption. This will be reflected in a one-off (or in any case temporary) shifting of credit flow fractions, which a larger fraction being used for financial transactions *vis a vis* real-sector

transactions in goods and services. Financial innovation so serves the real economy's need, in that it boosts real-sector productivity and its ability to service its increased debts. But it also opens up the possibility of a *sustained* drain of liquidity from the real to the FIRE sector, so inflating asset prices – a credit bubble, or harmful 'financialization' of the economy (Epstein 2005). Arnold (2009), quoting Giovanni Arrighi's (2007:230) definition of financialization as the 'capacity of finance capital to take over and dominate, for a while at least, all the activities of the business world' identifies the financialization process since the late 1970s as a "transformation within the macro political economy [which] poses several questions for accounting research as we attempt to understand accounting's relationship to the unfolding crisis". Consider this 'financialisation' scenario, pertinent to recent experience, through a flow-of-funds lens.

By accounting identity, any credit flows to firms and households (through banks' credit creation as they lend) exceeding the growth of investment, production and consumption in the real economy will be held as wealth, and so invested in FIRE sector assets. This extra liquidity inflates the money value of financial assets and instruments (housing, stocks, bonds, currency, derivative instruments etc.), so increasing returns on financial investments. Through their rising net worth, firms and households can - if lending regulations allow - borrow more against their collateral; and if they believe this to be sustainable, they will. This means that banks create yet additional credit which is again invested in the FIRE sector, further pushing up asset prices. Each flow of credit has its balance sheet counterpart in increased debt levels for firms and households. The new situation is characterized by (a) higher returns on financial assets relative to real-economy investment, and (b) a larger part of the (say, annual) credit flow going towards debt servicing and financial fees, and a smaller part to investment in the real sector (see Stockhammer, 2004 for evidence on this). In early stages of a financial asset boom, the benefits from (1) will more than balance the costs of (2), especially if future debt servicing costs are discounted or neglected. This encourages a next cycle of credit flows, debt growth and asset price rises. With psychological mechanisms such as herding behaviour leading to housing or stock market euphoria - and in the absence of regulation to stop it - there can be a self-sustained dynamic of credit flows shifting away from the real economy and into financial asset market, with ever growing financial asset returns and individual net worth figures, and a growing debt service burden on the real economy. Along the course of this financial boom, Friedman's (2009) all-important 'fraction of the economy's total returns absorbed up front by the financial industry rises and the function of the financial system in the economy' changes from supportive to extractive. Consumption – and the production that depends on it - may become financed more by fresh credit and debt flows from the FIRE sector based on capital gains than by

real-sector wages and profit. Thus net saving by firms and households may fall and even turn negative.

An accounting (or balance sheet) view of the economy makes clear that this dynamic – a bubble – is unsustainable in the sense that it is constrained by the real economy's ability to service debt. Yet without policy intervention, it can last for many years or even decades, if starting from low levels of indebtedness. A burst occurs as investors realize this constraint is approaching or has been reached. The severity of the impact of a burst will be the larger as real-economy consumption (and thereby production) have grown more dependent on capital gains rather than on wages and profit.

This 'financialisation' scenario is a self-sustained dynamic separate from real-sector fundamentals (in other words, a bubble) increasing debt burdens but not bolstering the real-economy's potential to create valued added from which to repay its growing debt. It is typically driven by the psychological and political economy factors discussed in section 3. In terms of financial incentives, its impetus is that it brings increased asset price gains for a time, but this is unsustainable in the long term as a source of debt servicing. Borio (2004:5) writes that "contrary to conventional wisdom, the growth of markets for tradable instruments … need not have reduced the likelihood of funding (liquidity) crises". On the contrary, applying an accountig lens demonstrates that because of the debt growing in parallel with tradable instruments, inevitably a bad loan problem (or debt crisis) develops, credit flows dry up –either in a 'soft landing' or in a 'credit crisis' - and a repositioning of financial portfolios and real-sector activity follows. The difference with sustainable financial innovation is difficult to draw while a financial bubble lasts, and mostly absent in the mainstream and popular discourses. As Friedman (2009) notes, "what is sorely missing in the discussion is attention to what function the financial system is supposed to perform in the economy and how well it has been doing it". That may be true for mainstream economists, but - as detailed in the Appendix - an accounting view of the economy did allow other analysts well before the bust to perceive this difference. Monitoring the accounting relations between the real economy and the financial sector flow revealed the growing imbalance in the flow of funds between the real and financial sectors, as well as the extent to which the economy had grown dependent on asset price gains. It so led to a projection of the limits to the economy's debt servicing capacity and the unsustainability of credit and debt growth, resulting in the Table 1 forecasts.

5. Structure and Institutionalization of Equilibrium Models

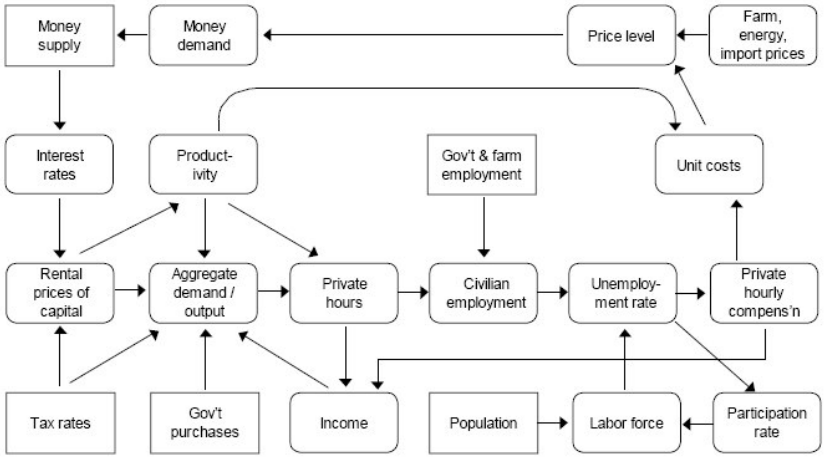
The alternative to the accounting models just reviewed will be referred to as 'equilibrium' models, after their most important trait. Wealth, debt, and the flow of funds are largely absent from these models. These are 'mainstream' models in the sense that all official macroeconomic forecasts, policy analyses and scenario building, in all countries, are based on equilibrium models (or on rules of thumb[2]). They are also 'mainstream' in the sense of being based on neoclassical economics, the mode of economic analysis that is dominant in the academic discipline of economics. This section presents case studies of a national and an international forecasting model of the equilibrium variety. The discussion will relate to model structures and the forecasts they generated, as well as to their institutional embeddedness and standing in the policy community.

The national model discussed here is the 'Washington University Macro Model' (WUMM) used in US policy making, developed and marketed by the firm "*Macroeconomic Advisers*"[3]. The "WUMM" is a quarterly econometric system of roughly 600 variables, 410 equations, and 165 exogenous variables. Figure 4 presents a schematic overview. The boxes indicate the variables included in the model. In the present context, the important observation is that all are real-sector variables except the money supply and interest rates, the values of which are in turn fully determined by real-sector variables. In contrast to accounting models, the financial sector is thus absent (not explicitly modelled) in the model.

[2] Some authorative forecast, such as those published by the Conference Board, are constructed by projecting current trends of 'Leading Economic Indicators', using relatively simply 'rules of thumb' for the extrapolation. The success of these forecasts relative to the alternatives demonstrates how difficult it is to predict based on theory-based models. Naturally, rules of thumb models do well in times of stability but not around points of radical change.

[3] Unless otherwise indicated, all information on the WUMM is taken from the *Macroeconomic Advisers* site at http://www.macroadvisers.com.

Figure 4 Schematic Overview of the Washington University Macro Model



Source: WUMM (2009)

The detailed explanation in the WUMM model book confirms that relations between variables in the model - represented by the arrows in Figure 4 - reflect the standard assumptions of mainstream economics including a life-cycle model of consumption, a transactions model of money demand, a vertical long-run Phillips curve, and long-run neoclassical models of fixed investment, labour demand, pricing and the distribution of income. If these assumptions are correct, then the model provides detailed predictions on the real economy. But by design, it cannot reflect a bubble driven by credit flows to the FIRE sector, which bursts due to excessive levels of debt: credit flows, the FIRE sector and debt are not among the variables in the model, nor are they fully reflected in the variables which are included.

Perhaps because of this omission, *Macroeconomic Advisers* chairman Joel Prakken could tell Reuters as late as September 2007 that the probability of recession was less than 50%, a "slightly higher risk than it was a month ago but not a dominant risk." This was well after Godley and associates in April 2007 had predicted output growth "slowing down almost to zero sometime between now and 2008" and in November 2007 forecast "a significant drop in borrowing and private expenditure in the coming quarters, with severe consequences for growth and unemployment".

A prominent example of equilibrium models for international use is the model operated by the Organization for Economic Cooperation and Development (OECD), described in Rae and Turner (2001). This is the OECD's "small global forecasting" model linked to its larger forecasting

model called INTERLINK, used to produce globally-consistent short-term forecasts of the major aggregates for the United States, the Euro area, and Japan. Its key variables include output, inflation, the trade balance, and import prices. These are driven jointly by neoclassical theory and monetary and fiscal policy, exchange rates, and world demand.

Just as in the WUMM, monetary and financial variables are included, but their values do not result from explicitly modeled flows of funds and are derived exclusively from real-sector developments. For instance, inflation depends on the output gap – that is, the gap between actual output and potential output – and various components of imported inflation. The model as a whole has the property that output gaps will eventually close to restore equilibrium. Other financial variables - including nominal exchange rates and short-term and long-term interest rates - are determined by forward-looking monetary policy rules in which short-term interest rates depend also on the output gap and on the expected future core inflation rate. Bond rates in turn then depend on expected future short-term rates. There are no credit flows, asset prices or increasing net worth driving a borrowing boom, nor interest payment indicating growing debt burdens, and no balance sheet stock and flow variables that would reflect all this.

It is interesting that the authors recognize this omission, and discuss that such elements can be added on an *ad hoc* basis. Rae and Turner (2001:5) write that this introducing of "alternative assumptions … allows a little more economic richness to be temporarily added to the model when it is used for policy analyses, especially for those situations in which financial markets and expectations play important roles in the transmission of shocks within and between regions". Likewise, "[s]everal country-specific variables have been added to the domestic demand equations in order to capture recent experience. For the United States, a measure of share-market wealth relative to disposable income has been an important recent determinant of domestic demand. The Japanese equation includes the real price of land because the 1990s cannot be explained by monetary and fiscal variables alone. The long stagnation is partly driven by balance sheet problems in the financial sector, which in turn is partly the result of the collapse of asset prices since the late 1980s." (Rae and Turner, 2001:12). In addition to its *ad hoc* adjustment to the reality of balance sheet effects, the OECD is currently planning the introduction of a new model, triggered by 'changing conditions'. The new model includes "domestic and global stock-flow consistency with respect to wealth linkages and wealth effects" (Richardson 2006), very similar in name at least to Godley's 'stock-flow consistent model' (Godley and Lavoie 2007).

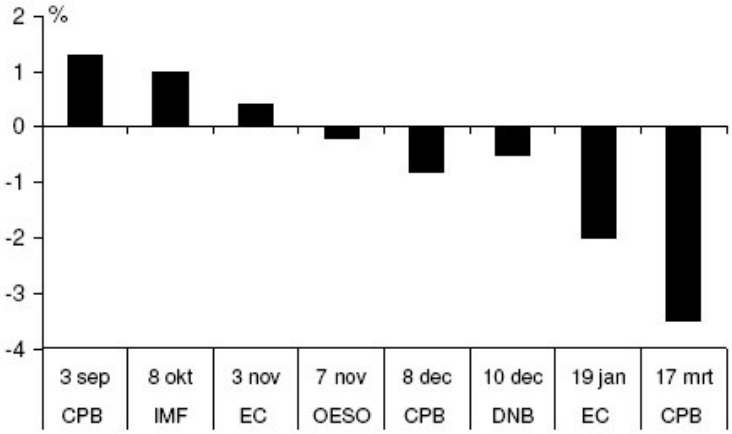
Still, just three months before the financial crisis broke in August 2007, the OECD released its 2007 World Economic Outlook, in which it commented (OECD 2007:7) that

"[i]n its Economic Outlook last autumn, the OECD took the view that the US slowdown was not heralding a period of worldwide economic weakness, unlike, for instance, in 2001. Rather, a "smooth" rebalancing was to be expected, with Europe taking over the baton from the United States in driving OECD growth. Recent developments have broadly confirmed this prognosis. Indeed, the current economic situation is in many ways better than what we have experienced in years. Against that background, we have stuck to the rebalancing scenario. Our central forecast remains indeed quite benign: a soft landing in the United States, a strong and sustained recovery in Europe, a solid trajectory in Japan and buoyant activity in China and India. In line with recent trends, sustained growth in OECD economies would be underpinned by strong job creation and falling unemployment."

Other important mainstream forecasts by international bodies, such as those by the European Commission and the IMF, will not be discussed separately. They derive from models structurally similar to that of the OECD, and were subject to the same degree of misprediction around the crisis. For what they have in common is the rapid and unprecedented revision of economic growth forecasts when the credit crisis began to turn into a recession. In the Economic Outlook 2008 published in December 2007, the OECD forecast was that weakness in the US housing sector would drag down growth in "the near term" but it "is unlikely to trigger a recession". GDP growth was forecast to 2.0% in 2008. But at the time of this prediction Europe, the US and Japan were already in recession, and continued to be so throughout 2008. Instead of the models predicting reality, they were constantly catching up with reality.

As an example, Figure 3 presents the forecasts for the author's home of The Netherlands as made by the IMF, the European Commision (EC), the OECD (OESO in the Dutch abbreviation), the CPB (*Centraal Planbureau*, the official Dutch agency tasked with constructing macroeconomic forecasts) and also by the Dutch branch of the European Central Bank, DNB (*De Nederlandsche Bank*). All these official institutions use equilibrium models in constructing their forecasts. The graph shows that within the space of six months, consensus forecasts for 2009 GDP growth were revised from +1.2 % to – 3.5 %: a change which has never happened before. At the time of this writing in May 2009, the official Dutch forecast by the CPB had again been revised to – 4.8 %.

Figure 5 Changing official forecasts for the Dutch economy: Expected GDP growth rate in 2009, September 2008 – March 2009



Source: CPB (2009)

In conclusion of this section, one question that may be raised is *why* there is this dichotomy of equilibrium models dominating official forecasting and policy, and flow-of-funds models in use only in non-official analyses. Arnold (2009) asks accountants "[w]hy did neoclassical economic thought become unquestioned doctrine in so much of our economic discourse?". And why indeed, do accountants have so little to add in the fields of macro financial stability assessment and growth forecasting, despite the demonstrated potential? Tentatively, two elements of an answer may be suggested: theory and institutionalization.

As noted, equilibrium models in use in policy making reflect neoclassical economics, the approach to economic analysis that is dominant in academic economics departments. This includes the behavioural assumptions of individual optimizing behaviour and a passive role (adapting to the 'fundamentals') for the financial sector and for the flow of funds. Flow-of-fund or accounting models reflect assumptions about the role of the financial sector and about individuals' behaviour which are heterodox relative to this academic orthodoxy. Given the strong intertwinement of economics teaching, research and policy making, it is only natural that heterodox models have not gained a foothold in official forecasting and policymaking. Institutionalization of forecasting models in policy follows the institutionalization of equilibrium theory in academia. In order to

probe this hypothesis, below the institutionalization of the leading US forecasting model WUMM within US academia and policy making is studied[4].

On its link to orthodox economic theory, the WUMM model book explains that the "properties of all key equations are explicitly derived from neoclassical theory, imparting to the model both monetarist and supply-side characteristics in the long run. This emphasis on theory endows the model with an internally consistent structure that renders WUMM well suited not only for short-run forecasting but also for long-term policy analysis."

On the institutionalization, WUMM owner *Macroeconomic Advisers*, while an independent commercial firm, is closely intertwined with official policy and forecasts and with US academia. It started in 1982 as *Laurence H. Meyer & Associates*. The model used by *Macroeconomic Advisers* was developed by Meyer and collaborators at Washington University and licensed to clients from 1983. The model won wide acclaim in government circles and there is a revolving door between the US Federal Reserve and its three Directors, each of whom have held or now hold top positions in US monetary policy advice[5].

The *Macroeconomic Advisers* approach also reflects the official US viewpoint on financial stability as its founder Laurence Meyer participated in negotiations toward a new international capital accord and represented the Federal Reserve Board in the international Financial Stability Forum. Significantly, Meyer was also chairman of the US Committee on Supervisory and Regulatory Affairs and oversaw the Board's regulatory implementation of Gramm-Leach-Bliley Act. This act in 1999 replaced the more cautious 1933 Glass Steagall Act and allowed banks to trade in mortgages and derivative products. Meyer so maintains close ties with US monetary policy making[6]. He is also a highly respected academic macro economist. He holds a professorship in economics at the University of Washington and published hundreds of articles in leading economics journals.

A tentative conclusion from this case study might be that equilibrium models and official forecasters are bound by ties of theoretical kinship and institutional embeddedness – ties that

[4] Unless otherwise indicated, all information on the WUMM is taken from the *Macroeconomic Advisers* site at http://www.macroadvisers.com.

[5] Chairman Joel Prakken served with the Federal Reserve Bank of New York prior to co-founding *Laurence H. Meyer & Associates*. Co-founder and President Chris Vervares was a member of the staff of the President's Council of Economic Advisers in 1981-1982. Laurence Meyer served on the Federal Reserve Board of Governors from June 1996 (upon which the name of the firm was changed from *Laurence H. Meyer & Associates* to *Macroeconomic Advisers*) to January 2002. In addition Brian Sack came to Macroeconomic Advisers in 2004 from a Federal Reserve Board position, and in 2009 left to serve at the Federal Reserve Bank of New York.

[6] *Macroeconomic Advisers* advertises its founder by noting on its site that Meyer was lauded by the then Chairman Alan Greenspan who said that, "Larry Meyer has made an important contribution to the Board's monetary policy. His thoughtful insights … have materially enhanced the deliberations of the Board and the Federal Open Market Committee. His influence will carry on beyond his tenure as a Board member."

include academia and policy makers at the highest levels. The sociology of science and policy making suggest that it would be difficult to insert in this constellation an approach that is scientifically heterodox and politically critical of the monetary policy establishment – two distinguishing features of all analysts listed in Table 1. On the other hand, as noted the OECD appears to be moving in the direction of including balance sheet elements in its model.

6. Comparing Accounting and Equilibrium Models

Having reviewed both types of models, in this section their key differences are identified and discussed. 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, flow-of-und models have an emphasis on accounting identities, on the role of uncertainty, of economic psychology and on political economy as the key behavioural assumptions. Absence of the notion of equilibrium does not mean that these models are indeterminate. They do have steady states (Godley 1999) and the logical implications of accounting models are determinate - in some respects more so than those of equilibrium models, as will be discussed below.

Most of the analysts discussed in the Appendix 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 a 1995 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" (Keynes, 1937:213-24). 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 behaviour 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 (e.g., 2000) has articulated motivational models of human behaviour 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 (e.g., 1978). Sørensen (2006) similarly explains the housing bubble by information cascades and herding behaviour, 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[7]. These policies are observed to have helped stave off (intendedly or otherwise) recession after the 1999 dotcom collapse, even though in fostering a wealth-cum-debt bubble they stored up the present 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) 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).

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 behavioural equations capturing researcher's assumptions about decisions by economics agents on saving, investment, borrowing, lending, employment, and transactions. In equilibrium models, the action is in the behavioural assumptions, which drive model responses to shocks and determine performance forecasts. The typical behavioural 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 accounting models 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

[7] These issues are well within the purview of accounting research to critically analyze, but as Arnold (2009) notes, "we… failed to be … critical in the sense of recognizing the politically and socially contested nature of accounting practices… and to grasp developments within the world of accounting practice or describe the ways in which financial reporting standards, accounting firms, and accounting ideologies were implicated in the build up to the crisis."

accounting models, such as those developed by Godley (1999), Graziani (2003), Keen (2006), Hudson (2006b) and Godley and Lavoie (2007) are grounded in the 'endogenous money' view of the economy, where banks' credit creation is viewed as central and indispensible 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 accounting models also from input-output models, which describe flows of goods and services perhaps denominated in money terms, but without finance and the flow of funds 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 behavioural equations, equating of marginal cost and revenue 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 behavioural assumptions on households and the government. For instance, 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 and 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. Accounting models 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 assumes 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. Accounting 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.

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. "He espoused the idea that mathematical econometric models of individual behaviour are the only tools we will ever have" (Shiller 2008:42). This contrasts to the analyses discussed in section 3 which are all on the level of the economic system, not the individual.

Relatedly, an important difference between accounting and equilibrium models is that the identity equations in an accounting model aim to reflect the flow of funds in the economy in a complete (though obviously stylised) manner. It is specified where each flow of funds comes from and where it goes. Each transaction is by some sector with 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 an accounting model is reflected in changes in the accounts of banks and lenders, whereas an increase in the money supply in the typical macrocoenomic model (see Figure 4, top left) simply is an increase in the value of the money stock (M2 or M3) *ex nihilo*; the actual money creation process, and the accompanying flow of funds (principal and interest payments) is not specified.

Accordingly, in equilibrium models, solving the optimization problems is what determines the model outcome. In accounting models, its completeness drives the outcome, as the 'watertight accounting of the model implies that there will always be one equation which is logically implied by the others' (Godley 1999:395) – with important practical implications. For instance, in accounting models including a private sector (firms and households), a government sector and a foreign sector, sectoral balances must sum to zero. This identity allowed Godley and Wray (2000) to conclude that 'Goldilocks was doomed': with a government surplus and current account deficit, economic growth had to be predicated on private debt growth – an inference impossible to make from an equilibrium model. Accounting models can identify a growth path as unsustainable given the existing bedrock accounting relations in our economic system, leading to a sure prediction of its reversal (even though the triggering event, and its timing, will be less clear). No such certainty is built into equilibrium models.

7. Accountants and Economists: Theoretical Pedigree of Macroeconomic Models

In the last three sections, accounting (or flow-of-funds) and equilibrium models were identified and discussed with regard to their structure, institutionalization and underlying assumptions. Finally, it is illuminating to reflect on an important difference also in theoretical pedigree – a difference which goes back to the very beginnings of modern economics. Macro-economic equilibrium models are ultimately grounded in the model of a national economy pioneered by the French 18th century economist Francois Quesnay, who drew up the *Tableau Economique*, and whose followers were the first to be called 'economists'. The *Tableau* described the circular flow of goods (but not of funds) through the various sectors of the economy. Accounting models, on the other hand, are circular-flow models like Quesnay's *Tableau*, but the emphasis on the importance of the circulation of funds (not only goods) distinguishes it from Quesnay and from modern equilibrium theory. This view of the economic system is summarized in 'Say's Law' that 'production creates its own demand', named after the French 18th century thinker Jean Baptiste Say.

The principal difference between the two views is that Quesnay and the *économistes* neglected the positive roles of trade, entrepreneurship, capital ownership, and money, and attributed all productive value ultimately to agriculture (which gave the school its name of Physiocrats). Say, in contrast, recognised what would now be called the demand side of the economy: the importance of the purchasing power embodied in money to keep the circular flow moving, and of the intermediaries of traders and bankers to make this happen. Demand must balance supply, and assets liabilities. The circulation of goods in the real economy is mirrored by the origination and movement of debt claims in the financial system, and the development of the complete economic system can only be understood taking both circuits into account. In contrast, money and other financial flows were absent from Quesnay's *Tableau*. While it is true that "[b]oth Say's Law and the theory of equilibrium income – its intellectual complement and historical rival – can be traced back to a common origin in the Physiocrats", as Sowell (1972:219) wrote, this does little to help understand the important differences between the two approaches. Indeed, Say has often been misconstrued (Baumol, 1977).

If the Physiocrats were *économistes*, then Say's was an accountant's approach to the national economy. The point he made in the Law that bears his name ('production creates its own demand') was not about a tendency to equilibrium. Say's Law was not that in a free market, demand and supply will automatically equilibriate though the price mechanism leading to full employment – an interpretation of it that Keynes attacked during the Great Depression. Say's Law

is an accountant's logical equality: all sold output will be bought. "Inherent in supply is the wherewithal for its own consumption", is the literal translation from the French[8]. The purchasing power embodied in the funds acquired by producers to produce goods, passes via wages and profit to become the funds that embody the demand for those goods. Though this is an axiom, it is not therefore a tautology without analytical use. As demonstrated above, it is the very logical completeness of accounting models that allows for their distinctive forecasting ability, e.g. on how sustainable debt-driven growth is. For instance, it implies that if the funds acquired by producers to produce goods are drained to the FIRE sector in debt servicing, this will interrupt the productive flow of fund and so disrupt economic growth[9].

Say's 'accountant's view' of the economic system was the main cause of his dispute with the Physiocrats. Tellingly, the arch father of the Physiocrats, Pierre Samuel Dupont de Nemours, wrote to Say begging him to 'leave the counting house' and not to 'imprison himself in the ideas and language of the British, a sordid people who value a man only by the money he spends…" (Whatmore 2001: 38). Discounting the Gallic chauvinism, Dupont had still keenly perceived the essence of Say's view on the importance of purchasing power to set in motion the 'wheel of commerce', in the words of Adam Smith (whom Say venerated). It was this reality of the monetary side of the circular flow that is the economy, which Say attempted to capture – a dimension conveniently abstracted from in the Physiocrats' system, which represented only the real economy, with money as a mere unit of account and a means of aggregation.

Conversely, Say's principal grudge against the Physiocrats (whom he ridiculed with zest) was their penchant for such abstraction. In his *Treatise on Political Economy* he wrote that "[i]nstead of first observing the nature of things, or the manner in which they take place, of classifying these observations, and deducing from them general propositions, they commenced by laying down certain abstract general propositions, which they styled axioms, from supposing them to contain inherent evidence of their own truth. They then endeavoured to accommodate the particular facts to them, and to infer from them their laws; thus involving themselves in the defence of maxims evidently at variance with common sense and universal experience…" (Treatise on Political Economy, Book I, paragraph 47). In terms of scientific method, there was a clash between the Physiocrats' deductivism and Say's inductivism. This is mirrored today in the deductivist methodology of neoclassical economics (which starts with 'abstract general propositions') which differs from those heterodox approaches which aim to inductively 'first observe the nature of

[8] As Sowell (1972) notes, Say's Law in turn goes back on yet earlier observations, perhaps as early as Ecclesiastes 5:11 (3rd century BC): "As goods increase, so do those who consume them".
[9] I thanks Gunnar Tomasson for drawing my attention to the original interpretation of Say's Law.

things' before moving to 'general propositions'. Accounting models include the flow of funds in the 'nature of things' to be reflected in its general proposition (or models); equilibrium models abstract from the flow of funds and from accounting relations from the very first of its axioms. So although "[b]oth Say's law and the theory of equilibrium income – its intellectual complement and historical rival – can be traced back to a common origin in the Physiocrats…" (Sowell 1973:219), their analytical view differed widely already at the beginning.

The intellectual duel between Say and the Physiocrats gave rise to two distinct schools. In the development of economics as a discipline, it is fair to say that the Physiocrat approach won this duel hands down. Say's approach survived via the works of, among others, Mill (1848), Keynes (1930) and Schumpeter (1954) into current theorizing by the 'Post-Keynesian' and 'circuitist' schools of economics (e.g. Rochon 1999; Fontana 2000; Graziani 2003). This emphasizes the circular flow of funds, accounting relations in the economy, and the monetary context of production and consumption. Academically, this approach is marginalized. It is not taught in academic (under)graduate courses on money and banking or on monetary policy, nor publicised in even the top 100 of economics journals (ranked, for instance, by impact rating).

In contrast, the neglect of credit and debt remained central as 18th and 19th century political economy developed into the 20th century academic discipline of economics. It was incorporated in (and greatly facilitated) the 'Marginal Revolution' in the late 19th century, which installed individual optimization firmly as the central organizing principle in economic models. Its core model of the economy became Leon Walras' construction of a set of interconnected commodity markets which simultaneously clear through the interaction of commodity price signals. This laid the foundation for general equilibrium theory, with no role for money (let alone credit and debt). The *Tableau Economique* also underpinned the later invention of input-output models pioneered by Wasily Leontief, and operationalised into national accounting models from the 1930s to 1950s by Richard Stone in the UK, Ragnar Frisch in Norway, Jan Tinbergen in the Netherlands and Robert Solow in the US. In the construction of the national statistics, the *Tableau* culminated in the System of National Accounts, the authorative prescription for GDP calculations published jointly by the United Nations, the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Co-operation and Development, and the World Bank. In academic analysis, the Physiocrat spirit culminated in money-less Computable General Equilibrium (CGE) models widely used today in policy analyses as diverse as fiscal reform, development planning, international trade and environmental regulation (Wing 2004:2).

8. Summary, Reflections and Conclusions

This paper made the fundamental point that recognizing the accounting forms in which economic relations of necessity exist, is indispensible for understanding the economic and financial system's sustainability. Those forms are perhaps best analyzed in flow-of-fund or 'accounting' models of the macro economy. This argument was developed with reference to the discrepancy between professional assessment and reality before and during the 2007-8 credit crisis and ensuing recession. It documented the sense of surprise at the credit crisis among academics and policymakers, giving rise to the view that 'no one saw this coming'. Contradicting this common opinion, it carefully documented the analyses by those professional and academic analysts who did 'see it coming', and who issued public predictions of financial instability induced by falling real estate prices and leading to recession. The common elements in their analyses were identified, implying an 'accounting' view of the economy. The structure of accounting (or flow-of-funds) models underlying these predictions was explored, as were the structure and crisis prediction performance of 'equilibrium' models used to form official forecasts in central banks, by governments and by international bodies. The key differences between the two types of models were brought out in a systematic comparison of their underlying assumptions and their theoretical pedigrees. It was also suggested that the institutionalization of official models, and their reflection of mainstream economic theories, may so far have precluded the adoption of accounting models. In conclusion of this paper, two reflections seem apt.

In introducing accounting concepts into conventional models (as the OECD is doing), the challenge may well be to explore how far model synergies and incompatibilities reach, and what type of model is best fit for which purpose. In the context of break points in economic development such as the credit crisis, it is "better to be roughly right than precisely wrong', as Keynes famously wrote. In situations where the FIRE sector plays a crucial role, equilibrium models provide detailed forecasts on e.g. labour force participation, unit costs, hourly compensation and civilian employment, but fail to anticipate momentous change due to debt growth. Conversely, the accounting models reviewed here include far less detail on the real sector but are better at identifying finance-driven turning points.

Such exploration of the synergies and proper domains of accounting and equilibrium models, however, would require an open-minded consideration of the merits of accounting models of the economy. This still appears to sit uneasily with the continued dominance in policy making and academia (including the field of accounting) of neoclassical economics. Hopwood (2009) views

economics as "a subject … appearing as one that invest quite heavily in the policing of its intellectual boundaries" and where "much of the diversity [of debates] has been banished". Arnold (2009) likewise self-criticizes the accounting field by asserting that "our dominant theories provided an insufficient bases for understanding the transformations that were occurring in the international political economy over the past quarter century or for analyzing the relationship between macro level changes, such as the rise to power of the financial sector, and the micro level field of financial accounting practice." In parallel to the promotion by some of an 'economics of accounting' to improve analysis in the field of management accounting (Christensen and Feltham 2007; Jordan 1989), there appears to be scope for an 'accounting of economics' in the field of macroeconomic and macrofinancial stability assessment and forecasting.

This research programme would have as its central tenet that we need to understand how dynamics in accounting relations underpin and shape our economies. The underlying reason is that economic relations and transactions in modern economies are embedded in the double-entry accounting framework. All transacting is predicated on economic agents extending credit to each other, and credit (whether trade credit or bank credit) is fungible with money. Money is not just a unit of account; it is the reflection of relations of debit and credit, and thus money itself is an accounting concept (Wray 1998, 2004). Having a monetary economic system predicated on accounting relations and the regulations that shape them, implies that an accounting lens is indispensable in the analysis of financial stability. This is the accounting dimension of the 'significance of the monetary context of economic behavior' also researched in heterodox economics (Fontana and Gerard 2002). More specifically, the balance sheets of firms, households and governments, and the regulations in the economic system on what sorts of balance sheets are being allowed, co-determine what forms new credit flows can take, how much there can be of it to different sectors (e.g. to the FIRE sector versus the real economy), and consequently how the economy will evolve. These will not be the only factors shaping the economy, but neither can they be fully abstracted from, as is current practice in much of economic research. In sum, there seem to be important contributions that accounting researchers can make to economics - rather than just the other way round, as is sometimes suggested.

Indeed, Arnold (2009) urges that accounting researchers need to be asking questions such as "why did standard setters adopt fair value accounting for financial instruments without regard for the macroeconomic consequences of sanctioning the proliferation of complex, unregulated and systematically dangerous financial products?". Accounting researchers should be bolder in pointing out and analyzing the implications of specific accounting rules and practices for macroeconomic

development, and probing the political economy reasons for their introduction. This study has sought to provide a context for such research to be undertaken.

Appendix: They Saw It Coming

In collecting the data presented in this Appendix in an extensive search of the relevant literature, four selection criteria were applied. Only analysts were included who provide some account on how they arrived at heir conclusions. Another criterion was that analysts went beyond predicting a real estate crisis, also making the link to real-sector recessionary implications, including an analytical account of those links[10]. Third, the actual prediction must be 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[11].

The twelve analysts described here – the number is entirely an outcome of the selection criteria – commented on the US, UK, Australian and Danish situations. All are (or were) analysts or commentators of global fame. They are presented in alphabetical order.

Dean Baker is co-director of the Center for Economic and Policy Research in Washington[12]. Baker discussed the consequences of the bubble in the US housing market in 2002, when he 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, both to the economy as a whole, and to tens of millions of families that will see much of their equity disappear unexpectedly. The economy will lose an important source of demand as housing construction plummets and the wealth effect goes into reverse. This will slow an economy already reeling from the effects of the collapse of the stock bubble [of 1999, DJB]…Unfortunately, most of the nation's political and economic leadership remained oblivious to the dangers of the stock market and dollar bubbles until they began to deflate. This failure created the basis for the economic uncertainty the country currently faces … [which] will be aggravated further by the deflation of the housing bubble. This process will prove even more painful if the housing bubble is allowed to expand still further before collapsing" (Baker 2002). Further expand it

[10] This criterion excludes, for instance, John Talbott, a former investment banker for Goldman Sachs and a visiting scholar at UCLA's management school. He wrote *The Coming Crash of the Housing Market*" and *Sell Now! The End of the Housing Bubble* (January 2006), both of which accurately described overlending practices and the housing bubble. Talbott hints at the wider implications but does not analyse them.

[11] This last criterion excludes economist Raghuram Rajan of the University of Chicago who in a 2005 paper discussed how perverse incentives in deregulated financial markets posed a risk to the economy, but without any indication of when trouble might break. The paper was presented at a Kansas City Federal Reserve Symposium under the theme of "The Greenspan era: Lessons for the Future". It also excludes Claudio Borio, an economist with the Bank for International Settlements, who in a 2004 paper titled " Market Distress And Vanishing Liquidity: Anatomy And Policy Options" wrote 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 actually reduce the likelihood of traditional funding liquidity crises. Conceivably, in fact, it could even raise that likelihood,…"

[12] Not to be confused with the London-based Centre for Economic Policy Research, which never predicted a crisis.

did, and in early 2004 Baker sponsored a $1,000 essay contest to solicit the most-convincing argument that the housing market was not in a bubble[13] (Lewis, 2004). In May 2004, Baker sold his apartment in the Washington Adams Morgan. He was quoted as saying "I felt like a fool holding onto it I'm pretty sure that prices around here will plummet"[14].

In 2005 Baker predicted in a scholarly paper that asset prices in the US were bound to fall in the medium term (Baker et al 2005). In November 2006, he published the more urgent *Recession Looms for the U.S. Economy in 2007* in which he forecasts that weakness in the housing market was likely to push the economy into a recession in 2007, predicting -0.7 % GDP growth over 2007. Baker wrote that "[t]he wealth effect created by the housing bubble fuelled an extraordinary surge in consumption over the last five years, as savings actually turned negative. …This home equity-fuelled consumption will be sharply curtailed in the near future…. The result will be a downturn in consumption spending, which together with plunging housing investment, will likely push the economy into recession….Over the course of the year, the economy will shed 1.2 million jobs." Baker's prediction was only slightly premature as official US GDP growth remained a positive 2 % in 2007 on average, though falling towards the end of the year. The US recession officially started in December 2007, costing 1.6 jobs till December 2008 (BEA figures).

Wynne Godley is a Distinguished Scholar at the Levy Economics Institute of Bard College, New York and a Visiting Research Associate with the Cambridge Endowment for Research in Finance (2002-2005). From 2000 he has consistently argued that a US housing market slowdown was unavoidable in the medium term, and that its implication would be recession in the US. Godley warned that 'Goldilocks is doomed', as he put it in a 2000 article with Wray. 'Goldilocks' was the simile after the children's tale, employed in the years after the dotcom crash for the US economy, which was said to be neither too 'cold' (low unemployment) nor too 'hot' (low inflation). Godley and Wray (2000) argued that this stability was unsustainable, as it was driven by households' debt growth, in turn fuelled by capital gains in the real estate sector. Based on an accounting framework of the US economy developed by Godley (on which more below), they predicted that that as soon as debt growth slowed down – as it inevitably would within years -, growth would falter. When house prices had started to fall, Godley and Zezza (2006) published *Debt and Lending: A Cri de Coeur*. They demonstrated again the US economy's dependence on debt growth and argued that only the small slowdown in the rate at which US household debt levels were rising, resulting form the house

[13] The winning essayist, Hilary Croke, was a researcher for the Federal Reserve.
[14] The average price of Adams Morgan neighbourhood started dropping from their November 2005 peak of US$ 551,000 to a low of US$ 480,000 in January 2007. It was at the same level in February 2009 (data from zillow.com).

price decline, would immediately lead to a "sustained growth recession … somewhere before 2010" (Godley and Zezza, 2006:3). In January 2007, the US Congressional Budget Office (CBO) produced its annual report, which, as Godley and others noted in an April 2007 analysis, had predictions on GDP and inflation "indicating a Goldilocks world in the medium term" which they deemed "wildly implausible" (p.1) as it required continued growth in household indebtedness while real estate collateral values were I na steep and continued fall. In contrast to CBO projections of GDP growth averaging 2.85 percent between 2007 and 2010, Godley in April 2007 predicted output growth "slowing down almost to zero sometime between now and 2008 and then recovering toward 3 percent or thereabouts in 2009–10"; but warned that "unemployment [will] start to rise significantly and does not come down again." (Godley et al 2007: 3). Again, in November 2007 Godley and others forecast "a significant drop in borrowing and private expenditure in the coming quarters, with severe consequences for growth and unemployment". These forecasts describe the actual developments from spring 2007 until the time of this writing in spring 2009. If anything, they were sanguine: US growth not only 'slowed to zero' but actually turned negative in 2008, and the recovery 'toward 3 percent or thereabouts in 2009–10' is now widely forecast, but yet to start.

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 over the last 200 years. 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 analysed 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.

Michael Hudson is a Distinguished Research Professor of Economics at the University of Missouri (Kansas City), president of the Institute for the Study of Long-term Economic Trends and a Wall Street financial analyst. Hudson has criticized economic growth based on asset price inflation as

unsustainable and polarizing. Based on his monitoring of the US National Product and Income Accounts, he wrote *Saving, Asset-Price Inflation, and Debt-Induced Deflation*, a paper presented at a 2004 academic conference and subsequently published as Hudson (2006a). In it, he noted the 'large debt overhead – and the savings that form the balance-sheet counterpart to it' as the 'anomaly of today's [US] economy'. He warned against the 'self expanding growth of savings' and the unsustainable 'growth of net worth through capital gains', fuelled by US monetary policies (of generous credit flows and decreasing interest rates) and tax policies (of un-taxing real estate gains in their treatment of depreciation and interest payments). In his analysis, the "natural limit to the process was reached in 2004 when the Federal Reserve reduced its discount rate to 1 percent. Once rates hit this nadir, further growth in debt threatens to be reflected in draining and amortization payments away from spending on goods and services, slowing the economy accordingly."

In 2005 Hudson wrote 'The Road to Serfdom: An Illustrated Guide to the Coming Real Estate Collapse', which was published in April 2006 in *Harper's Magazine*. In it he wrote that "almost everyone involved in the real estate bubble thus far has made at least a few dollars. But that is about to change. The bubble will burst… America holds record mortgage debt in a declining housing market… For those who bought at the top and who now face decades of payments on houses that soon will be worth less than they paid for them, serious trouble is brewing. …. Rising 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). That summer the housing market turned, leading to the credit crisis and recession a year later.

Eric Janszen is an investor and commentator. He established the *iTulip* website in November 1998 to parody the then rampant 'Internet Bubble' as a speculative mania. He called the top of the dotcom bubble in March 2000 and shut the site down after the dotcom crash of that year; but started it again as the housing market developed into what he believed to be a bubble. In August 2001 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. Like that reflation, the stock market after 2001 was unlikely to produce meaningful inflation-adjusted results."

In 2006 he wrote in *America's Bubble Economy: Profit When It Pops* that the US would enter a recession within years. In December 2007 he warned subscribers to his investment advice that US stock markets were likely to begin in 2008 to experience a "Debt Deflation Bear Market"

market that would more or less track the Nikkei during the first year of the Japanese debt deflation, when it lost 40 % from December 1989 to December 1990. The Dow Jones then declined from 13,365 points in December 2007 to 7,880 points in December 2008, losing 42 % of its value. Janszen (2009) writes that "this forecast was uncomplicated if you understood the simple underlying dynamic: US 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 US 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, warnings which were argued as alarmist by mainstream economists. The global monetary system … started to come apart in 2007 following the crash of the securitized debt market, that followed the collapse of the housing bubble. It had to come apart anyway; the securitized bond market happened to be the proximate cause."

Stephen Keen is Associate Professor of Economics & Finance at the University of Western Sydney and a fellow of the Centre for Policy Development. A specialist in financial instability, – he published an academic paper in 1995 titled *Finance and Economic Breakdown* – Keen (2008) wrote that "[i]n December 2005, almost two years before the crisis hit, I realized that a serious financial crisis was approaching. I was so worried about its probable severity–and the lack of awareness about it amongst policy makers–that I took the risk (for an academic) of going very public about my views. I began commenting on economic policy in the media, started the DebtWatch Report, registered a webpage with the apt name of www.debtdeflation.com, and established the blog *Steve Keen's Oz Debtwatch*."

He first publicly predicted Australia's financial troubles in December 2005 in an interview on Perth radio and ABC Radio. In December 2006, Keen (2006) wrote that the debt-to-GDP ratio in Australia (then 147 per cent) "will exceed 160 per cent 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. The reasons are simple: paying down excessive debt causes borrowers to stop spending… So when will this recession begin? On current data, the domestic economy may already be in one – though the China boom has more than compensated for the domestic downturn. What can be done to avoid it? Unfortunately, almost nothing." In September 2007 he published, with the Centre for Policy Development, the report "Deeper in Debt", writing that "our current problems [will] lead, I expect, to severe economic dislocation" (Keen 2007: 45). In January 2009 the IMF revised its 1.8 % forecast for Australian GDP growth in 2009 down by an unprecedented 2 %, to – 0.2 %

(Stutchbury 2009). The Reserve Bank of Australia in May 2009 revised its 2009 forecast from 0.5 % to -1.0 % (Kwok 2009).

Jakob Brøchner Madsen is a professor in economics at Monash University. From 2003, while professor in economics at the University of Copenhagen, he has 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". The Danish business paper *Børsen* in its December 4, 2008 issue featured an overview of his forebodings (Agaard 2008). In 2003 Madsen wrote "I am very pessimistic. We are heading into something in the world which is worse than what we experienced in 1982 [the last 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."

Under Madsen's supervision, his student Jens Kjaer Sørensen wrote an MA thesis in 2005-2006 on 'The Dynamics of House Prices – International Evidence' going back to 1920s-1930s (to the 1840s for the Netherlands). In it, Sørensen demonstrated the existence of the first international synchronized housing boom in the UK, Norway, US and the Netherlands. He showed that credit growth due to liberalization 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". He predicted a decrease by up to 40 %. According to *StatBank Denmark* data, the growth in family homes price in Denmark petered out in the third quarter of 2007, and prices declined from that peak by 12 % until the end of 2008, the latest observation the time of this writing. Economic growth halved from 3.3 % in 2006 to 1.6 % in 2007 and the economy contracted by 1.1 % over 2008 (source: StatBank Denmark) [15].

[15] I thank Jens Sørensen for providing details and help in data collection in the Danish case study.

Kurt Richebächer (1918-2007) wrote one of the longest-standing investment newsletters, "The Richebächer Letter," 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. He warned against the bubble in technology stocks in the late '90s. 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." He 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 in 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" though soaring asset prices has been driven by ultra-cheap and loose money and credit, and not by saving and investment…" Richebächer (2006a:4). Just before the turning of the US housing market in summer 2006, 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"… "Given 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. … 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". He again emphasized its cause: "the great trouble for the future is that the credit bubble has its other side in exponential debt growth" … "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" (Richebächer, 2006b:1,5,9,11-12). And in September 2006 he wrote hat "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. … "There 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).

Paul Volker, former Chairman of the US 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).

Nouriel Roubini is Professor of Economics and International Business at the Stern School of Business, New York University, Research Associate at the NBER and Research Fellow with the CEPR. He is a former advisor to the U.S. Treasury Department and former member White House Council of Economic Advisers. He runs the *Roubini Global Economics Monitor* and a *Global Economics Blog* (http://www.rgemonitor.com/blog/roubini, from which all quotes below are taken). He predicted in summer 2005 that real home prices were likely to fall at least 30% over the next 3 years, and published warnings about the recessionary implications from the very beginning of the house price decline. On August 23, 2006, he wrote that "[b]y itself this [house price] slump is enough to trigger a US recession". On August 30, he wrote that "[t]he recent increased financial problems of … sub-prime lending institutions may thus be the proverbial canary in the mine – or tip of the iceberg – and signal the more severe financial distress that many housing lenders will face when the current housing slump turns into a broader and uglier housing bust that will be associated with a broader economic recession. You can then have millions of households with falling wealth, reduced real incomes and lost jobs…" In a Nov 17, 2006 blog he analysed that "the housing recession is now becoming a construction recession; and the construction recession is now turning into a clear auto and manufacturing recession; and the manufacturing recession will soon turn into a retail recession as squeezed households – facing falling home prices and rising mortgage servicing costs – sharply contract their rate of consumption." He correctly predicted that quantitative easing by the Federal Reserve would lead to a short lived stock rally at the end of 2006, turning into a share price plunge once a coming recession was obvious towards mid 2007. Through 2006 and 2007, Roubini continued warning of further house price falls (where others saw it bottoming out), and of its systemic implications leading to recession in 2007.

Peter Schiff is a stock broker, investment adviser and commentator. He was an economic adviser for Ron Paul's campaign in the 2008 Republican Party primaries. On May 16, 2006 in debate on the television channel *Fox News*, Schiff forecast that the U.S. housing market was a bubble that would soon burst. In an August 2006 CBNC interview, Peter Schiff asserted that : "[t]he United States economy is like the Titanic ...I see a real financial crisis coming for the United States." He rose to media prominence following the publication of his book early 2007 book *Crash Proof: How to Profit From the Coming Economic Collapse*. Written over the previous two years, *Crash Proof*

predicted the popping of the US housing bubble and the consequent financial crisis, including the failure of mortgage banks Fannie Mae and Freddie Mac and the collapse of the US financial sector.

Robert Shiller is a Yale economics professor who predicted both the dotcom and housing bubbles. Shiller has noted that too much potential wealth is still locked up in land and real estate. In order to trace that wealth he created, with Karl Case, the authorative Case-Shiller Index of US home-prices. In *The New Financial Order* (2003) Shiller warned that infatuation with the stock market was fuelling volatility and distracting us from more durable economic prospects of building up real assets (as opposed to financial assets), ''fundamental to our well-being but increasingly exposed to pervasive risks" (Karabell, 2009).

He published a book, *Irrational Exuberance*, on a bursting stock-market bubble just as the burst arrived in March 2000, and another, *The Subprime Solution* on the subprime meltdown just as the meltdown went global in summer 2008. He warned that home prices were looking "very anomalous" in the 2nd edition of *Irrational Exuberance* in 2005, published one year before the market turned. In the preface to that edition he wrote that " further 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. This extreme outcome … is not inevitable, but it is a much more serious risk than is widely acknowledged." Again, in August 2006 he wrote that "there is significant risk of a very bad period, with slow sales, slim commissions, falling prices, rising default and foreclosures, serious trouble in financial markets, and a possible recession sooner than most of us expected" (Case and Shiller, 2006).

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