



Understanding financial crisis through accounting models

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A B S T R A C T

This paper presents evidence that accounting (or flow-of-funds) macroeconomic models helped anticipate the credit crisis and economic recession. Equilibrium models ubiquitous in mainstream policy and research did not. This study traces the intellectual pedigrees of the accounting approach as an alternative to neo-classical economics, and the post-war rise and decline of flow-of-funds models in policy use. It includes contemporary case studies of both types of models, and considers why the accounting approach has remained outside mainstream economics. It provides constructive recommendations on revising methods of financial stability assessment and advocates an 'accounting of economics'.

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Introduction

On 9 December 2008 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). This idea that 'no one saw this coming' has been a common view from the very beginning of the credit crisis. And yet it would be premature to ask "Why did nobody notice?", as Queen Elizabeth II did in November 2008 (Pierce, 2008). It is not difficult to find predictions of a credit crisis and recession in the years leading up to it – not only by pundits, but by serious analysts from the world of academia, policy institutes, think tanks and finance. The point of this paper is that there is something to be learned from this observation: "we must reflect on it" in the words of Governor Stevens. The credit crisis and ensuing recession may be viewed as a 'natural experiment' in the valid-

ity 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.

There is an immediate link between accounting and the ability of some economists to predict the crisis. Previewing the results, 'accounting' (or flow-of-funds) models of the economy turn out to be the shared mindset of a large subset 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, and that accounting identities play a major role in the model structure and outcomes. If society's wealth and debt levels reflected in balance sheets are among the determinants of its financial stability and of the sustainability of its growth, then such models are likely to timely signal threats of instability. This does not imply that balance sheet data are more accurate or objective than other data, or that accounting professionals are inherently superior in analytical skills or work ethic than macroeconomic model builders. But it does mean that models that exclude balance sheets – such as the general equilibrium models widely used in academic and Central Bank analyses – are prone to 'Type II errors' of false negatives, rejecting the possibility of crisis when in reality it is just months ahead.

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With a few exceptions, this point seems to have been overlooked to date. When Krugman (2009) prominently asked ‘How did economists get it so wrong?’ he gave a number of reasons, but did not discuss – other than in a passing mention – those economists who did *not* get it wrong (Galbraith, 2009). In the accountants and auditors community, the dominant response in the wake of the credit crisis has been to re-examine accounting regulations such as ‘fair-value’ accounting (Boyer, 2007; Laux and Leuz, *in press*), mark-to-market accounting, lax auditing practices, and the like; or to ask how accounting models can reflect what has happened (Roberts and Jones, *in press*). It is important to stress from the outset that the present paper aims to make an entirely different point. It is a response to the call by Arnold (2009) in this Journal to examine “our failure to understand ... the macroeconomic and political environment in which accounting operates” (also, Hopwood 2009). One key to understanding policy makers’ environment is the neglect of balance sheet effects in policy advice. This paper therefore draws attention to the ‘accounting approach’ within economic analysis underpinning flow-of-funds models, where balance sheets effects are central. It also attempts to explain the neglect of the ‘accounting approach’ by policy makers.

‘No one saw this coming’

The trigger to the credit crisis turned out to be the US real estate market and its derivative products, but the broader trend leading up to it was financial globalization, and the speculation and opacity that this allowed which, in turn, was possible largely due to financial deregulation. Indeed, as Reinhart and Rogoff (2009) show in a survey of financial crises in 66 countries over eight centuries, deregulation is among the best predictors of financial crisis. But with a few exceptions, neither these trends nor the trigger appear to have been clearly identified beforehand as risky by the leading academic, policy and business institutions. A few examples illustrate. Josef Ackermann, CEO of *Deutsche Bank*, in 2008 recounted a July 2007 lunch to discuss the looming risks to the financial system. Attended by chief executives of leading banks, political leaders, and senior Federal Reserve officials, the deepening woes in the sub-prime mortgage market did not figure high on the agenda. “We clearly underestimated the impact”, said Ackermann (Landler, 2008). 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” (Das, 2006; emphasis added). Again, a 2006 IMF report on the global real estate boom asserted 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”. The consensus view is that “[n]o one foresaw the volume of the current avalanche” (Wellink, 2009). These and other examples and quotes all create the impression that in the policy,

academic and business communities, the credit crisis came as a bolt out of the blue. Greenspan (2008) in his October 2008 testimony before the Committee of Government Oversight and Reform indeed professed to “shocked disbelief” while watching his “whole intellectual edifice collapse in the summer of [2007]”.

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. Take, for instance, Wynne Godley, affiliated with the Levy Economics Institute of Bard College (NY) from the mid-1990s until his death on 13 May 2010 at the age of 83. From 2000 he had 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 Randall 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 and its derivative products. Based on an accounting framework of the US economy, they predicted 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 from the house price decline, would immediately lead to a “sustained growth recession ... somewhere before 2010” (Godley & Zezza, 2006: p. 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 in a steep fall. In contrast to CBO projections of GDP growth averaging 2.85 percent between 2007 and 2010, Godley and others in April 2007 predicted output growth “slowing down almost to zero sometime between now and 2008” and warned that “unemployment [will] start to rise significantly and does not come down again”. 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” (Godley, Papadimitriou, Hannsgen, & Zezza 2007: p. 3). These forecasts describe the actual developments from spring 2007. If anything, they were sanguine: US growth not only ‘slowed to zero’ but actually turned negative in 2008.

Godley’s assessment is part of a set of public predictions which are not only *ex post* correct but also reasonably specific about the mechanism and timing of the credit crisis, as well as its recessionary implications. Together they believe

the notion that ‘no one saw this coming’, or that those who did were either professional doomsayers or lucky guessers. But the more important and constructive contribution is that there appears to be a set of interrelated elements central and common to the thinking of these contrarians. 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. To be sure, this does not mean there is a single unifying paradigm that led these economists to their predictions. All, however, have distanced themselves in print from mainstream neo-classical economics, in particular from its behavioural assumptions and its neglect of assets and debt. To the best of the author’s knowledge, no one predicted the crisis on the basis of a neo-classical framework. This suggests that a non-mainstream approach has been helpful and conversely, that neo-classical economics has a blind spot for financial instability.

Can we be more specific in order to identify a “non-neo-classical economic framework for understanding the economy and accounting’s relationship to it” (Arnold 2009)? For reasons of scope and focus, this paper will analyse the theoretical framework used by a sizeable subset of these contrarian analysts who identify with the ‘Post-Keynesian’ tradition in economics, and who used an ‘accounting approach’ to macroeconomic assessment. This is, of course, not to claim that there were no other economists who predicted the crisis,¹ or that accounting academics or accounting firms predicted either the timing or the scale of the crisis. Rather, I will study the work of a school of economists who paid attention to macroeconomic accounting relations. Before moving to considering this Post-Keynesian accounting approach, this section concludes with three other examples of analysts from this school: Dean Baker, Michael Hudson and Stephen Keen.

Dean Baker is co-director of the Center for Economic and Policy Research in Washington. In 2005 Baker predicted in a scholarly paper that asset prices in the US were bound to fall in the medium term (Baker, DeLong, & Krugman 2005). In November 2006, he published the more urgent *Recession Looms for the US 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 million jobs till December 2008 (BEA figures).

Michael Hudson is a Research Professor at the University of Missouri. 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’. 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 “the bubble will burst. . . . America holds record mortgage debt in a declining housing market. . . . 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.

Stephen Keen is an Associate Professor of economics and finance at the University of Western Sydney. A specialist in financial instability – he published an academic paper in 1995 titled *Finance and Economic Breakdown* – Keen 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%) “will exceed 160% of GDP by the end of 2007. We simply cannot 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”. 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, 2010: p. 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). In the event, Australia was the only major economy to implement a house prices (and mortgage debt) reflation program (the ‘First Home Owners Boost’), which curbed Australia’s falling debt levels within a year after the spring 2008 crash. Australia recorded only

¹ Other analysts include financial commentators Peter Schiff and Kurt Richebächer, who both adhere to the ‘Austrian School’ in economics, which emphasizes savings, production (not consumption) and real capital formation as the basis of sustainable economic growth. Also Yale professor Robert Shiller, a behavioural economists interested in the psychology of boom and bust, or the ‘animal spirits’ driving financial and other markets (Akerlof and Shiller (2009)). Claudio Borio and William White of the Bank for International Settlements have long emphasized the role of credit (e.g. Borio, 2004; Borio & Lowe, 2004); White has warned for financial instability at official meetings, although in guarded ‘bankers’ language’ (See also BIS, 2004). Others such as New York University’s Nouriel Roubini do not identify in their writings with a particular theoretical paradigm.

one quarter of GDP contraction in 2009 and so avoided a technical recession (which requires two successive quarters), though at the cost of accumulating yet more debt.

Without neglecting the contributions from other traditions, the 'accounting approach' within 'Post-Keynesian' economics shared by Godley, Baker, Hudson, Keen and others seems to have been particularly predictively successful, and also the theoretically most developed, as elaborated below. This makes it amenable to comparing and contrasting it to the mainstream economics approach underpinning consensus projections. The defining features of the accounting approach include (a) recognition of the circular flow of goods and money in the economy and the balance-sheet identities implied, (b) a separate representation of stocks (inventories, wealth and debt) and flows (of goods, services and financial 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-optimizing 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. For theoretical papers outlining these principles, see Baker et al. (2005), Baker (2006), Keen (1995), Keen (2009), Hudson (2006a), 2006b), Godley (1999), Godley and Wray (2000), Godley and Zezza (2006), Godley et al. (2007) and Godley and Lavoie (2007a), Godley and Lavoie (2007b).

The accounting approach in economics: theoretical pedigree

In this "Section" trace the historical pedigree of the contemporary accounting approach. Analysts located within this strand may be found throughout the history of economic thought both in Britain, on the Continent and (later) in the US. For one example, Skaggs (2003: p. 377) discusses the Scottish economist Henry Dunning Macleod (1821–1902) as a representative, within the British tradition, of the accounting approach. Skaggs identified as critical elements linking these analysts their "treating money as rooted in debt (so emphasizing that every credit is mirrored in a debit); avoiding equilibrium analysis, but rather thinking in terms of unfolding processes; and treating banks as creators of credit, not mere intermediaries"; and they "refused to net out assets and liabilities, and rejected extreme aggregation". These features, listed verbatim by Skaggs as part of the 'accounting approach' (2003: p. 377), are strikingly similar to the elements identified above as central to the thinking of 'those who saw it coming'.

This section presents a bird's eye view of the intellectual history of the accounting approach up to the work of Baker, Godley, Hudson, Keen and other contemporary analysts. This overview cannot possibly do justice to the many practitioners of this approach, but it emphasizes seven key contributions: by Quesnay and Say in the 18th century; Marx in the 19th; Kalecki and Schumpeter in the early 20th century; and Minsky and Tobin in the post-war years.

The accounting approach starts with the 'circular flow' view of the monetary economy. That is, each transaction of goods and services finds its counterpart in a flow of

credit/debt instruments, and these financial flows are seen to be integrated (circular): each flow comes from somewhere and goes somewhere. Hence it is possible to represent the economy in a balance sheet manner, where liabilities and assets balance by definition. The circular flow idea was present in classical thought from the start. In the *Wealth of Nations* (Book 2, Chapter 2) Adam Smith in 1776 wrote of the economy as moved by the 'great wheel of circulation', an idea adopted from Francois Quesneau who had depicted the circular flow in the famous *Tableau Economique* (1758). But there is no monetary dimension in the *Tableau*, nor in its famous 20th century successor, the input–output framework developed from it by Leontief and others. To emphasize the monetary side of the circuit was left to Jean Baptiste Say (1767–1832), whose famous Say's Law can be traced back to a common origin in the Physiocrats (Sowell 1973: p. 219). Say's 'Law' is the subject of an ongoing interpretation debate (Baumol, 1977; Kates, 2003). In Chapter 15 of his *Treatise on Political Economy* Say writes that "...a product is no sooner created, than it, from that instant, affords a market for other products to the full extent of its own value". This suggests more that supply constitutes demand than that supply causes demand (the 'supply-side' interpretation of Say's Law that Keynes attacked during the Great Depression). It articulates per-definition equality of supply and demand, not causality from supply to demand. The emphasis on 'its own value' also suggests that Say's Law is a monetary statement; another version is that 'there will be an excess supply of goods if there is an excess demand for money.' Say's Law as stated by Say so is an accountant's logical equality: all sold output will be bought. It is a tautology in the sense in which equations in theoretical physics (such as $E = mc^2$) and balance-sheet equalities (assets equal liabilities) are tautologies: true by definition, but not therefore analytically unhelpful. This identity was to become the bedrock foundation of the accounting approach to the macroeconomy.

Of the Classical economists, Karl Marx (1818–1883) was most explicit in drawing out the implications of viewing the economy as a monetary circuit. It allowed him to identify the existence of the 'Profit Puzzle' that revenues normally exceed costs resulting in profit – which is a puzzle in a truly circular flow, where no value enters from outside or leaks away. In *Capital* (vol. 2, Chapter 16), Marx asked "[h]ow can the entire capitalist class manage to draw continually £600 out of circulation, when it continually throws only £500 into it?". He suggested the solution of this Puzzle to lie in the creation of credit: "in fact, although paradoxical at first sight, the capitalist class itself throws into circulation the money which serves to realise the surplus value" (*Capital* vol. 2, Chapter 17). The circular view and its monetary nature (the credit system) were so central to Marx's understanding of the economy. Marx also emphasized that the economy (what is now called the 'real sector') is not the same as "the plethora of moneyed capital – a separate phenomenon alongside industrial production" and so distinguished between "Money-Capital and Real Capital" (the title of Chapter 30 of *Capital*).

These elements – the monetary nature of the capitalist economy and differentiating between types of financial

flows according to their uses – were further developed in the works of Marx' two principal followers: Joseph Schumpeter and Michal Kalecki. In their lifetimes, economics and accounting separated as economists replaced the framework of the circular flow as their organizing principle with a microeconomic framework, where analyses shifted from the level of the economic system to the level of the individual and his or her marginal calculations of costs and benefit. This 'Marginal Revolution' in economics was championed by William Jevons, Carl Menger and Leon Walras in the 1860s and 1870s and canonized by Alfred Marshall in his influential *Principles of Economics* (1890), the first neo-classical textbook. Neo-classical economics then became mainstream economics, and analysts who continued to take a circular flow view of the economy were now increasingly heterodox. The Keynesian Revolution of the 1930–1950s did not change this, as discussed below.

Joseph Schumpeter's (1883–1950) seminal *Theory of Economic Development* is entirely set in the context of "the circular flow of traded goods" (1934: p. 8). In it, he notes that "the fundamental proposition of the equality between the value of the product and of the services of labour and land still excites astonishment", because it implies zero profit and interest, as Marx had observed earlier. Schumpeter made the analysis of this puzzle the framework for his theory of profit, interest and entrepreneurship in the rest of the book. Schumpeter's name is also linked to the idea that "the financial system can promote economic growth", as King and Levine put it in their 1993 paper "Finance and Growth: Schumpeter Might be Right". Further, Schumpeter accorded credit and debt – rather than an aggregate like 'the money stock' – a central place in his analysis, and in addition differentiated between sorts of credit. In his 1939 *Business Cycles* he wrote that "[d]ebt arising from credit created to finance the innovations and business expansions that increase productivity is 'productive' debt. But credit created in the secondary wave for consumers, speculative businesses and financial speculators, results in a build-up of 'unproductive' debt..." (as summarized by Leathers and Raines, 2004: p. 672).

Michal Kalecki (1899–1970), building on Marx' analysis, realised that profits must, by definition, be equal to the sum of gross investment, plus the fiscal deficit, plus the trade surplus, plus capitalists' consumption minus workers' savings. This was his famous profit equation, the result of his 1930s research on Polish national accounts. It amounts to a (probably the first) stock-flow consistent system of the economy (fully developed in the posthumous Kalecki 1971). Rather than being a mere manipulation of identities, Kalecki's use of this macro-accounting identity was, like Schumpeter's, to reflect the circular flow of income and the monetary integration of the economy – a feature more fully exploited in the later stock-flow consistent models by writers like Tobin and Godley.

Kalecki also refused to analyse aggregates like 'the money stock' without recognizing the link to credit and its balance-sheet counterpart, debt. This is illustrated in Kalecki's 1944 reply to the prominent economist Arthur Pigou, who had argued that a self-correcting mechanism would be at work when unemployment rose and wages decreased. Assuming a constant stock of money, Pigou rea-

soned that the decline in the wage/money ratio (deflation) would imply that the real value of the money stock increased and savings would rise to the points where the corresponding investment would realise full employment. Kalecki countered this by the observation that what constitutes money is bank deposits, whose counterpart is the banks' assets (mostly, bank loans). Therefore any gain to deposit holders would be offset by a loss to those depending on bank credit, as deflation pushed up the real value of debts and this "would consequently lead to wholesale bankruptcy" (Kalecki 1944: p. 132). Kalecki had so shown, using elementary balance sheet reasoning, how the nature of money (liquid bank liabilities) combined with the equality of liabilities and assets (bank loans) dispelled the rosy deflation scenarios that Pigou had painted. There are striking parallels to Godley's (1999) reasoning about debt (household liabilities) and house prices (household assets) in his rejection of optimistic CBO projections 63 years later (see "No one saw this coming").

Kalecki's work also offered a window to re-integrate monetary macro-accounting in what would become mainstream Keynesian macroeconomics. Working with John Maynard Keynes while in Cambridge in the 1930s, he was at the right place at the right time. As Chapple (1991) and others have shown, Kalecki had also thought through and published the key ideas (such as effective demand) later developed in Keynes' revolutionary *General Theory* (1936), so the two economists were akin theoretically. Yet Kalecki's name has remained obscure compared to Keynes and his theoretical approach never became widely adopted. Importantly, Kalecki and Keynes failed to jointly establish a new macroeconomics which was both 'Keynesian' and included an accounting view. This new macroeconomics would have to wait till the work by Minsky, Tobin and Godley in the 1970s and 1980s (discussed below). Why was this? Apart from important differences in personality and social milieu, a key reason is that Kalecki was trained in and theorized from the 'circular view' vantage point (and thus from an accounting framework) which was still the norm in Continental economics till the 1950s, while Keynes had been trained by his mentor Marshall in reasoning from a supply and demand framework (Toporowski, personal communication). This difference in theoretical vantage point resulted on Keynes' side in incomprehension and little interest in Kalecki's theory.

Hyman Minsky (1919–1996) was a student of Schumpeter at Harvard, and belongs in the accounting approach pedigree for the same reason: for Minsky, a detailed understanding of finance, and of its asset and liability effects, was central to understanding the macroeconomic business cycle. He went beyond the work of his mentor, however, by spelling out *how* finance affects not only economic development generally, but economic instability specifically. His best-known contribution was to formulate the "Financial Instability Hypothesis" (Minsky 1978; Minsky 1980), which says that financial instability is inherent in monetary capitalism. Periods of prolonged prosperity will cause the financial system to progressively increase its leverage, return rates and risk exposure, proceeding through the stages of 'hedge finance' onto 'speculative' and finally 'Ponzi' finance. Minsky spelled out both the psychology and the

technical financial details of this development, and demonstrated how it is a recurrent feature in monetary capitalism. He also worked extensively on how to move back from instability to stability and also here macroeconomic accounting realities were central to his solutions. In *Stabilizing an Unstable Economy* (1986), Minsky wrote that his analysis would be “based on accounting identities” and set out to “formulate ideas about what are the determining and the determined items in the accounting tables” (Minsky, 1986: p. 34). The financial management he proposes hinges on an accounting identity, namely “the significance of the proposition that the sum of the surpluses and deficits over all sectors must equal zero”.

A final contribution before the work by Godley, Baker, Hudson and Keen was by Nobel laureate James Tobin (1918–2002), who did much to establish the accounting approach academically in the 1980s. Tobin had earned his reputation working in the mainstream tradition, but in the 1980s turned to the accounting approach as he started a research program at Yale in stock-flow consistent modelling of the economy. This work contained many heterodox features not present in his earlier, neo-classical work. In the lecture delivered on the occasion of receiving the 1981 Nobel Prize in economics, Tobin outlined the defining characteristics of his stock-flow modelling approach: tracking of stocks and precision regarding time; several assets and rates of return; modelling financial and monetary policy operations; and the budget constraint and the adding-up constraints.

The Post-Keynesian accounting approach and mainstream economics

Kalecki, Minsky and Tobin were major inspirers of the accounting approach today, since the 1970s principally associated with ‘Post-Keynesian’ economics. This strand of economics aims to build on the foundation Keynes and his Cambridge collaborators laid, distinguishing itself from ‘New-Keynesian’ mainstream macroeconomics, which is ‘Keynesian’ only in that it allows for temporary disequilibrium caused by ‘sticky’ wages. Post-Keynesians see this simplification as a subversion of Keynes’ contributions, and instead view pervasive uncertainty and the monetary context of decision making as the key theoretical contributions made by Keynes (Fontana, 2000).

Post-Keynesianism was the setting for the birth of the contemporary accounting approach. From the 1970s, a group of Cambridge (UK) economists around Wynne Godley at the Cambridge Economics Policy Group (CEPG, established in 1970) began to develop what they called ‘stock-flow consistent’ models of the macroeconomy, inspired by Kalecki, Minsky and (later) Tobin. These models satisfied macro-accounting identities, focused on the flow-of-funds and distinguished between stocks (balance sheets) and financial flows and between different kinds of asset classes, avoiding undue aggregation. This ‘New Cambridge’ group in 1974 correctly predicted the end of the Heath-Barber boom in the UK against the consensus forecast, and later predicted UK inflation levels to reach over 20% (it peaked at 24% in 1975). The CEPG also contested the

monetarist policies introduced by the Thatcher governments from 1979 onwards, predicting an ‘extremely severe recession with unprecedented unemployment’ (Godley and Lavoie 2007b: p. xxxvii) which followed in 1980–1981. Godley and Cripps’ 1983 *Macroeconomics* was the first macroeconomics textbook written from a flow-of-funds perspective, followed a quarter century later by Godley and Lavoie (2007b).

If the accounting approach is theoretically and empirically well developed and predictively successful, why is it not more widely popular in academia and policy circles? Why have its methods not become part of the mainstream so that the 2007 crash was more widely anticipated (and therefore, paradoxically, perhaps avoided)? One answer, according to Pasinetti (2005), is historical and relates to the personalities of the generation of Cambridge economists working with or directly succeeding Keynes – Nicholas Kaldor, John Hicks, Joan Robinson and Richard Kahn – who apparently did not admit outsiders to their circle or sponsor their work. Another is that the Post-Keynesian approach lacks a coherent research program directed by an overarching model, as in mainstream economics. Post-Keynesianism finds its coherence only on the abstract level of emphasizing pervasive uncertainty and the monetary context of decision making. The ways in which this is operationalized differ widely between its adherents, and so do the research strategies (including empirical work) that follow from this. The results are that it is difficult for outsiders to understand what Post-Keynesianism is about, and that insiders spend much of their time debating their differences. This has done little to push the approach. But at the most fundamental level, the answer relates to a question asked by Arnold (2009), “[w]hy did neo-classical economic thought become unquestioned doctrine in so much of our economic discourse?” The accounting approach and its theoretical background of Post-Keynesianism have remained outside mainstream economics because it goes against central and longstanding principles in mainstream economics.

The monetary circular flow view of the economy – and thus the work by Marx, Schumpeter, Kalecki, Minsky, the later Tobin, Godley, Baker, Hudson and Keen – always was a heterodox approach relative to mainstream Classical and neo-classical economics, which denied the impact of finance on the economy (especially in the long run). The result is that in mainstream economic analysis, financing of transactions came to be seen as irrelevant. In the public sector, this was codified in the ‘Irrelevance Theorem’ which says that the government’s choice between tax financing and deficit financing is irrelevant to either real or nominal outcomes (Blinder & Stiglitz 1983). For the private sector, the Modigliani–Miller theorem or the ‘capital structure irrelevance principle’ states that the value of a firm is unaffected by how that firm is financed, whether the firm’s capital is raised by issuing stock or selling debt. In academic finance research, the central tenet of the Efficient Market Hypothesis asserts that prices on financial markets reflect all available information and thus the underlying values of real-sector assets. Therefore financial market cannot, by definition, experience bubbles or affect real-sector growth.

These assumptions build on a long tradition within mainstream economics of ignoring that money is a form of credit, the variety in credit instruments that make up an economy's financial liquidity, the different effects of different credit instruments, and the balance sheet effects and implications for indebtedness of monetary developments. These neglects have recently been widely noted again – e.g. by Werner (2005), Gardiner (2006), Geanakoplos (2009), and Schularick and Taylor (2008) – but they go a long way back. For instance, they were a shared feature also of the last great crisis. US Federal Reserve Chairman Lauchlin Currie in 1933 complained about the “Treatment of Credit in Contemporary Monetary Theory”; BIS economists Borio and Lowe in 2004 wrote a paper titled “Should Credit Come Back From The Wilderness?”. This is the orthodoxy relative to which any theory of the monetary capitalist economy – be it Marxist, Institutional or Post-Keynesian – was and is a heterodox strand of research in economics. Success to the Post-Keynesians would amount to nothing less than a scientific revolution in economics, where the field would let go of core mainstream principles such as multi-market equilibrium, individual optimization and the analytical equality of real and nominal variables. Kuhn (1962) has shown how rare scientific revolutions really are, and how successful ‘normal science’ is in defending the reigning paradigm by drawing up ‘protective belts’: marginal changes in its models accommodating some aspects of the rival paradigm without affecting its core theories.

In this respect, New Keynesianism is a case study in how mainstream economics has successfully neutered the Post-Keynesians' attack (helped, perhaps, by their own academic isolation). Godley's CEPG, for instance, lost its research funding in 1983 and was dismantled. British economists working in the Post-Keynesian tradition are now few and scattered across universities and research institutes; US centers of Post-Keynesian teaching are equally marginalized. This is the result of the wider replacement in the 1980s of a more pluriform economics by a renewed neo-classical orientation in the profession, typically to the exclusion of other approaches (as recounted e.g. by Colander, Holt, and Barkley Rosser (2004)). In the present context, this meant that instead of an openness among economic model builders toward using accounting principles, instead accounting researchers increasingly sought to explain accounting conventions in terms of neo-classical economics (Christensen & Feltham, 2007; Jordan, 1989) – part of a wider ‘economics imperialism’ trend to extend neo-classical methods and assumptions to the other social sciences (Lazear, 2000).

There were policy implications of this theoretical trend. The academic rise and decline of the accounting approach was reflected in the application of the accounting approach in ‘flow-of-funds’ models, which had been in use in official macroeconomic forecasting institutions until the 1980s, but were then discarded. This trend may be illustrated by the example of the Netherlands Bureau for Economic Policy Analysis, the official forecasting agency in The Netherlands. In the 1970s, its forecasting model (called VINTAF) came under increasing criticism for not including a monetary sector. The successor model (called FREIA) therefore

contained extensive monetary sectors. But “[a]fter the monetary submodel had been part of the national macro model for a couple of years, it was already removed in the FKSEC model”, write Don and Verbruggen (2006: p. 26) “[b]ecause interest rates were essentially the only modelled transmission mechanism from the monetary to the real sphere”. This absence of balance sheet effects and of quantitative aggregates such as credit flows or interest payments was typical of wider practice since the mid 1980s. Malcolm Knight, General Manager of the Bank for International Settlements, said in a 2006 speech that “[t]he prevailing mainstream theoretical paradigms, enshrined in current textbooks and research, find it difficult to accommodate a significant role for quantitative aggregates over and above that played by interest rates”. This, in a nutshell, is why accounting models have remained so marginal.

Accounting models

This section and the next discuss which elements of flow-of-funds models are central in understanding the determinants of an economy's growth and its likelihood of entering into a debt-driven recession. The contemporary accounting approach is described in Godley and Lavoie (2007b), a macroeconomics textbook along Post-Keynesian lines. Godley introduces what he describes as an ‘accounting framework’ (p. 18) to macroeconomics by writing that the aspiration is to “describe the evolution of the whole economic system, with all financial transactions (including changes in the money supply) fully integrated, at the level of accounting” (p. xxxiv). Such a holistic approach is the reason why economies evolve as they do, in the model: “the use of logically complete accounts ... has strong implications for the dynamics of the system as a whole (p. 9)”. But a holistic approach does not detract from completeness. “The fact that money stocks and flows must satisfy accounting equalities in individual budgets and in an economy as a whole provides a fundamental law of macroeconomics analogous to the principle of conservation of energy in physics” (Godley & Cripps 1983: p. 14). Because of the Post-Keynesian understanding that the existence of money is key to understanding the economy, the accounting approach pays explicit attention to the financial sector and in particular to banks. “Banks and their balance sheets have to be fully integrated into the production process, and interest flows have to be taken into account explicitly. Our accounting framework will allow us to do just that” (Godley & Lavoie 2007b: pp. 17–18). In all this, the accounting approach stands in stark contrast to mainstream, neo-classical macroeconomics.

Fig. 1 taken from Hudson (2006b), 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), and in applied work also including a foreign sector (as in Godley and Lavoie (2007b)). Central in this is the finance, insurance and real estate (FIRE) sector which includes all sorts of wealth-managing nonbank firms (pension funds, insurers, money managers, merchant

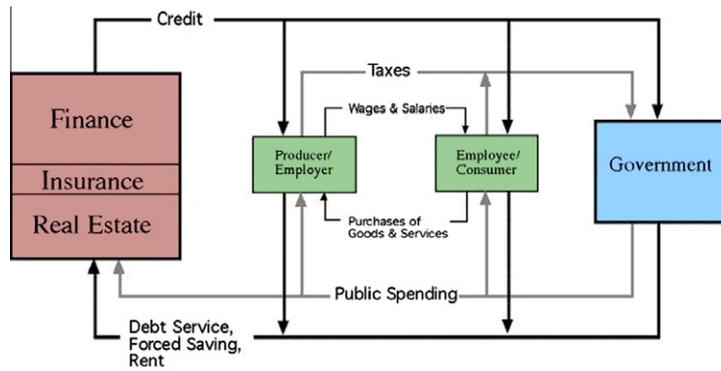


Fig. 1. Schematic overview of flow-of-fund models. Source: Hudson (2006b).

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, as noted by 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”.

Another presentation of flow-of-funds-models, which is especially suited to bring out their accounting nature, is in matrix form, as in Godley (1999). Like the Fig. 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. In common with Fig. 1, it reflects 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: p. 405). Another element is explicitly including payment flows such as interest pay-

| | Households | Firms | | Banks | | Govt. | Row sum |
|------------------------------------|-----------------------|---------------------|---------|-----------------------|---------|----------------------|---------|
| | | current | capital | current | capital | | |
| Consumption | -C | +C | | | | | 0 |
| Govt. expenditure | | +G | | | | -G | 0 |
| [Sales] | | [S] | | | | | |
| Change in the value of inventories | | +ΔI | -ΔI | | | | 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 | -ΔHp | | | | -ΔHb | +ΔH | 0 |
| Stock of current deposits | -ΔMn | | | | +ΔMn | | 0 |
| Stock of demand deposits | -ΔM | | | | +ΔM | | 0 |
| Stock of bills | -ΔBsp | | | | -ΔBsb | +ΔBs | 0 |
| Stock of bonds | -ΔB.pb | | | | | +ΔB.pb | 0 |
| Stock of loans | | | +ΔL | | -ΔL | | 0 |
| Column sum | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Fig. 2. The flow of funds in matrix representation. Source: Godley (1999).

ments, “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: p. 405).

The model reflects changes in the value of financial stocks, in inventories, and in household wealth. Accounting identities play an important role since: “[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 Fig. 2) – is always equal to the total of its transactions in financial assets”. The “watertight accounting of the model implies that there will always be one equation which is logically implied by the others” (Godley 1999: pp. 394, 395). Models actually used in policy analysis are more complex – including a private sector (firms and households), a government sector and also a foreign sector – but still sectoral balances must sum to zero. Specifically, Godley and Lavoie (2007b: p. xxxvi) note the ‘strategic importance’ of the ‘accounting identity which says that, measured in current prices, the government’s budget deficit less the current account deficit is equal, by definition, to private saving minus investment’ (an identity directly deriving from Kalecki’s earlier work). This identity allowed Godley and Wray (2000) to conclude that ‘Goldilocks was doomed’: with a government surplus and current account deficit, US economic growth had to be predicated on private debt growth, which had to slow down in the foreseeable future – an inference impossible to make from an equilibrium model. Accounting models can so 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 mainstream equilibrium models.

Debt crisis anticipations by accounting model users

Friedman (2009) notes that “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”. Using an accounting framework helps to redress this omission. Keen (2010) demonstrated in detail how a flow-of-funds model based on Minsky’s (1978), Minsky’s (1980) theory leads to this and other assessments. Godley and others could project that because of the debt growing in parallel with tradable instruments, financial ‘innovation’ inevitably led to a bad loan problem (or debt crisis) and a repositioning of financial portfolios and real-sector activity. Of all possible configurations of behaviour in the Godley model, only a default on debt can “unbalance the banks’ consolidated balance sheet” Godley (1999: p. 397). Conditions for such default may develop through a 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 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”. This ‘financialization’ scenario is what the Post-Keynesian analysts reviewed in this paper identified as the underlying and unsustainable trend, which ultimately had to lead to crisis. Viewed through a flow-of-funds lens, it is a process of excess credit and debt creation, along the following lines.

By accounting identity, any credit 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 since the 1980s especially in the US and UK).

In early stages of a financial asset boom, higher asset returns more than balance debt servicing. 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 – this becomes a self-sustained dynamic, especially if euphoria causes future debt servicing costs to be discounted or neglected. 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, as Hudson (2006b) emphasized. The economy’s credit flows shift progressively away from the real economy and increasingly 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. 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. This trend will be rationalized by ‘new era’ stories (technology in the 1990s, globalization in the 2000s), facilitated by financial ‘innovation’ (which creates additional credit flows and may help to obscure risks), and accompanied by pervasive changes in financial ethics and practice.

While these features of the bubble absorb most of the public’s, the regulators’ and the financial community’s attention, they cannot change the ancient reality that the economy’s debt-carrying capacity poses an immovable limitation to debt-driven growth. Calculations of this limit

proved reliable predictors of the crisis. This perspective allowed accounting approach practitioners like Godley and Zezza (2006) to analyse that ‘Goldilocks was doomed’, Hudson (2006) to write on ‘Saving, Asset-Price Inflation, and Debt-Induced Deflation’, and Keen (2009: p. 297) to conclude that “[w]hat is opaque from a neo-classical/Austrian perspective is obvious from a Minskian standpoint”. Ultimately the bursting of the bubble comes as investors realise 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.

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 absent from these models. These are ‘mainstream’ models in the sense that they rest on neo-classical theory and that all official macroeconomic forecasts, policy analyses and scenario building are based on equilibrium models (or on rules of thumb²). For instance, the model used by the US Congressional Budget Office discussed in ‘No one saw this coming’ is such a standard ‘textbook’ model, as the CBO (2010) indicates on its website. Unfortunately, the CBO does not release the details of the model (Glied et al., 2002).

Models typically used by central banks are a particular type of equilibrium models named ‘Dynamic Stochastic Equilibrium Models’ (or DSGE models), which reflect the ‘New-Keynesian’ theories discussed in The ‘Post-Keynesian accounting approach and mainstream economics’. By now numerous criticisms of the hegemony of DSGE models in central banks exist (for an overview, see ‘The economic crisis and New-Keynesian DSGE models: an evaluation’ by Meeusen (2009)). Tovar’s (2008) working paper for the Bank of International Settlements describes their properties and limitations. In particular, he notes that “possibly the main weakness in current DSGE models is the absence of an appropriate way of modelling financial markets” (p. 5). In consequence, in DSGE models “aggregate financial wealth does not matter for the behaviour of agents or for the dynamics of the economy” (p. 7). Another criticism is that DSGE models are technically advanced but of doubtful practical relevance: “challenges remain on how to effectively communicate their features and implications to policy makers... (p. 1)”. In other words, most central banks favour a type of model that is often too complex to be understood by policymakers but which cannot handle finance – surely, according to the critics, a first and fundamental requirement for any central bank model. The theoretical background is that DSGE models are

embedded in mainstream economics’ assumptions ignoring the effect of finance on the economy.³

Outside central banks, forecasters tend to use less sophisticated and more user-friendly equilibrium models, usually of the ‘Computable General Equilibrium’ (CGE) variety. One example of a national CGE model is the ‘Washington University Macro Model’ (WUMM) used for projections of the US economy.⁴ The WUMM is a quarterly econometric system of about 600 variables, 410 equations, and 165 exogenous variables. 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. The WUMM model book explains that the “properties of all key equations are explicitly derived from neo-classical theory... This emphasis on theory endows the model with an internally consistent structure...” (Macroeconomic Advisers, 2009) 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, the WUMM operating firm *Macroeconomic Advisers* could tell Reuters as late as September 2007 that the probability of a US recession was less than 50%, “not a dominant risk”.

A prominent example of equilibrium models for international use is the INTERLINK model operated by the Organization for Economic Cooperation and Development (described in OECD (2010)). This is used to produce globally-consistent short-term projections 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 neo-classical 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 modelled flows of funds; instead they 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 depend on

² Some authoritative 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 In illustration, Tovar (2008: p. 2) quotes a monetary official that using DSGE models is “like driving a Ferrari on a bumpy road”. The metaphor is telling: the ‘bumpy’ nature of the economy (which, as Minsky (1978) explained, originates in the financial sector), is conceptualized not as a key model feature, but as the key threat to the DSGE model (the Ferrari). It suggests more concern for the Ferrari than for the road.

⁴ The WUMM was developed and marketed by the firm “*Macroeconomic Advisers*”. Unless otherwise indicated, all information on the WUMM is taken from the *Macroeconomic Advisers* site at <http://www.macroadvisers.com>.

expected future short-term rates. In the basic version of INTERLINK 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 OECD has recognized this omission and 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 & Lavoie, 2007a). Still, just three months before the financial crisis broke in August 2007, the OECD released its World Economic Outlook, in which it commented (OECD, 2007: p. 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".

In sum, we find that the separation between mainstream economics and the Post-Keynesian accounting approach in academia is mirrored in the dichotomy of DSGE and CGE equilibrium models (underlying official projections) on one hand, and flow-of-funds models (in use only in non-official analyses) on the other. 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 a-financial equilibrium models in policy follows the institutionalization of a-financial equilibrium theory in academia.

Summary, reflections and conclusions

This paper made the point that an 'accounting approach' to understanding the macro economy is fruitful. The argument was developed with reference to the discrepancy between official assessments and reality before and during the 2007–2008 credit crisis and ensuing recession. This study documented the sense of surprise at the credit crisis among academics and policymakers, giving rise to the view that 'no one saw this coming'. It also reports analyses by some of those professional and academic analysts who did 'see it coming', and who issued public predictions of financial instability leading to recession.

The paper identifies common elements in their analyses and then focuses on a subset of these, sharing the 'accounting approach' to macroeconomic analysis. The paper traces the theoretical pedigree of the accounting approach within Post-Keynesian economics and explains its relative neglect within the economics profession. It explores the structure of accounting (or flow-of-funds) models, contrasting it to DSGE models used in central banks and CGE models such as the WUMM equilibrium model of the US economy and the model in use by the OECD. In conclusion of this paper, two reflections seem apt.

The upshot of this paper is not to advocate a wholesale replacement of equilibrium models. 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 such as the WUMM 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 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 neo-classical economics. Hopwood (2009) perceives economics as "a subject ... 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 analysing the relationship between macro level changes, such as the rise to power of the financial sector". In parallel to the promotion by some of an 'economics of accounting' to improve analysis in management accounting (Christensen & Feltham 2007; Jordan 1989), in the field of macroeconomic and macro-financial stability assessment and forecasting there appears to be scope for an 'accounting of economics'.

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