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Towards an ‘accounting view’ on money, banking and the macroeconomy: history, empirics, theory

Dirk J. Bezemer[★]

In this paper three views are considered which are traditionally associated with ‘money cranks’ and ‘brave heretics’. The first is that the credit nature of money has macroeconomic significance. The second is that financial development can be bad for economic growth. The third is that macroeconomic models need to be explicitly *monetary* macroeconomic models. It is argued that in each of these three areas, there has been a recent shift in mainstream economic opinion. This suggests new opportunities for meaningful debate between heterodox and orthodox schools on money and finance. It is further argued, following Skaggs (2003), that a common meeting ground could be an ‘accounting view’ of economics. This is a mode of macroeconomic analysis which explicitly uses accounting definitions, identities (that credit is also debt, or that flows of a variable affect the stock of that variable) or accounting methods (e.g. decomposing different kinds of liabilities, or linking flows of liquidity to flows of transactions) to structure and direct the analysis. The accounting view is highly pluralist yet clearly defined. I discuss its applications to each of the three views.

Key words: Money and finance, Accounting view, Pluralism
JEL classification: B52, C54, E44

1. Introduction

This paper responds to the editors’ ‘wish to focus on ... economic and political institutional arrangements ... to develop coherent alternatives’ to mainstream analysis. Credit and debt relations have been central to economic arrangements in virtually all known economic systems, stretching back in time to pre-history. Connected to these have been accounting rules and conventions—both formal and informal, both private and public—which define the hierarchy of moneys and which structure the growth and volume of credit and debt, and the range of its permissible uses. These accounting relations have been central in organizing production and exchange. Yet debt, credit and balance sheets are absent from much of economists’ theories and

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empirical research—ranging from the history of money’s genesis to current macroeconomic models, and from optimal currency area theory to research on financial development and economic growth.

The central argument in this paper will therefore be that rethinking money and banking must involve an ‘accounting view’ of the economy. The financial reciprocity between economic units—be they firms, banks, households or nations—which is reflected in balance sheets and accounting conventions should be a central element of understanding how economies work. What is at stake is the recognition that for every asset there is a liability, and for every debit a credit. This recognition should be a fundamental building block of economic theory, and therefore of the development of a ‘coherent alternative’ to mainstream analysis.

Specifically, an ‘accounting view’ informs our understanding of the nature of money, of the nature of financial development and its consequences for economic growth, and of macroeconomic models. While this has long been recognized in heterodox circles, the time appears ripe to make this case also in the wider economics community. In each of the above three areas, there has recently been a striking turnaround in the *communis opinio* among researchers. On the nature of money, it has become widely accepted that credit is created ‘out of nothing’, rather than only intermediated. Previously, this was a cherished point of ‘monetary cranks’ and the heterodox only. The erstwhile consensus that financial development is unambiguously good for income growth has recently given way to the recognition also in mainstream journals that financial development and growth in credit may cause less, not more, income growth, with more income inequality and financial fragility. Previously, this was only noted in the confines of the heterodox ‘financialization’ research community. And it has also become commonplace even in top journals, as in the mass media, to note that macroeconomic models have singularly failed in helping researchers and policymakers to either anticipate or understand financial instability. Previously, representative–agent models of multi-market equilibrium without credit, debt, balance sheets or even money reigned unchallenged. New Keynesian theorists working with these DSGE models could complacently note that the ‘state of macro was good’ (Blanchard, 2008).

In each of these three areas, the world has changed indeed. The question is how to account theoretically for these new findings and new views. The argument in this paper is that this may be fruitfully done by adopting an ‘accounting view’.

2. What is the ‘accounting view’?

In what follows, the term ‘accounting view’ will be used in a well-defined sense. An ‘accounting view’ is a mode of macroeconomic analysis which explicitly uses accounting definitions and identities (that credit is also debt, or that flows of a variable affect the stock of that variable) or accounting methods (e.g. decomposing different kinds of liabilities, or linking flows of liquidity to flows of transactions). Accounting definitions and identities are of course always implicit, and sometimes explicit, in any macroeconomic model which is internally consistent. What sets ‘accounting view’ research in the sense used in this paper apart from other kinds of macroeconomic analysis is that accounting concepts structure and direct the analysis.

2.1 *Three tenets*

To be more precise, I suggest that there are three features of the accounting view as applied in research on money, banking and the macroeconomy. The first is to

distinguish between uses of the means of finance (such as bank credit), rather than to conduct the analysis in terms of bulk concepts such as ‘money’ or ‘credit’—as if these were homogeneous quantities. For instance, home mortgages have vastly different macroeconomic effects from loans to nonfinancial business. Credit instruments also differ in their liquidity and therefore in their degree of ‘money-ness’, so that there is a ‘hierarchy of money’ (Mehrling, 2012) which structures the financial system. To study the financial system and its interaction with the economy is to study these ‘creditary’ structures and the way they are managed, as Gardiner (2006) emphasizes. Accounting view research should ‘reject extreme aggregation’, as Skaggs (2003, p. 377) puts it.

A second key feature of accounting view research is to distinguish between changes in flows and changes in stocks—for instance, between income flows and wealth stocks, or between credit flows and the stock of debt which they cause. When Kalecki quipped (supposedly) that ‘economics is the science of confusing stocks and flows’, the implication was that this stock/flow distinction was so fundamental that to miss it was, for him, where economics as a field went wrong.

A third tenet of the accounting view is to distinguish between the effects of assets and the effects of liabilities. This may seem too obvious, but it is surprisingly often overlooked. Growth in debt liabilities is the accounting counterpart of growth in deposit assets in the credit creation process, but this is often neglected, either by ignoring the liabilities growth or by netting out. To be sure, bank deposit assets (money) and bank loan liabilities (debt) can be netted out on the macroeconomic level (and this is customary in theoretical macroeconomic models), but to do that is to miss their separate effects on macroeconomic dynamics, which do not net out. Booming income growth due to a credit boom is not, in any defensible sense, ‘netted out’ by the recession due to debt overhang effects which it may engender. Over the course of credit booms and debt busts, the economy changes in terms of sectoral structure, productivity and inequality—precisely due to the boom and bust. To net out credit and debt, or to miss the liability side altogether by only tracing a ‘credit’ or ‘money’ variable, is to miss the causes of these structural dynamics. In Skaggs’s (2003, p. 377) words, taking an accounting view implies ‘treating money as rooted in debt (so emphasizing that every credit is mirrored in a debit)’ and ‘refusing to net out assets and liabilities’.

2.2 *The accounting view in the history of economic ideas*

The above definition and identification of three key features delineates the accounting view for the purposes of this paper. In keeping with this special issue’s theme, the focus will be on its contemporary relevance, but the accounting view is as old as economics itself. Skaggs (2003) discerns an accounting approach to macroeconomics in his discussion of the British Banking School, but an ‘accounting view’ surfaces throughout the history of economics, and straddles schools of thought and ideologies. The following examples illustrate.

The very first sentence of Adam Smith’s (1776) *Wealth of Nations* is an accounting equality: ‘The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes.’ Irving Fisher, in his 1906 textbook *The Nature of Capital and Income*, wrote that his aim was to ‘form a sort of philosophy of economic accounting and, it is hoped, to supply a link long missing between the ideas and the usages underlying practical business transactions and the theories of abstract economies’ (p. vii). Schumpeter in *The Theory of*

Economic Development viewed the economy as a ‘system of accounts’ which takes the economic surplus forward from one period to the next, and his student Hyman Minsky (1992, p. 12) held that ‘a capitalist economy can be described by a set of interrelated balance sheets and income statements’. John Hicks in 1942 in *The Social Framework: An Introduction to Economics* ‘instructs the readers to distinguish between stocks and flows, and to recognize how economic magnitudes are codetermined in a system of accounts’ (Klamer and McCloskey, 1991, p. 151). Kalecki’s (e.g. 1971) famous profit equation is a careful accounting for the sources of profit, in order to establish a framework for macroeconomic analysis. So does Leontief’s (1941) input–output framework which laid the foundation for the system of national accounts—although this framework neglected from the start financial flows not linked to production and exchange of goods and services. A more explicitly financial view is taken in Douglas Copeland’s (1947) ‘Money Flows’ approach, where the ambition was to trace all the financial flows in the US economy. Theorists of the monetary production economy, such as Graziani (e.g. 2003), aimed for a theoretical, stylized counterpart to Copeland’s empirical work: a skeleton model of the financial flows and stocks in the market economy to shed new light on the nature and function of credit money and of banks. In the 1970s and 1980s, Tobin worked on a research programme to connect the real and financial accounts of the economy. In his 1981 Nobel lecture, he emphasized the importance of ‘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’. Godley and Cripps published *Macroeconomics* in 1983, the first textbook to explicitly trace the flow of funds, using it to infer macroeconomic dynamics. This work was updated in Godley and Lavoie (2006), which aimed 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).

These highlights constitute a far from exhaustive list. Fuller discussions of the accounting view are in Skaggs (2003) and Bezemer (2010). Clearly, the accounting view is a broad church. Current work in the accounting tradition is by researchers as diverse as Caiani *et al.* (2014), Dosi *et al.* (2010), Duca and Muellbauer (2013), Keen (2011), Kinsella *et al.* (2011) and Werner (2005)—to name just a few. There remained until very recently a sharp dividing line which separated these contributions from most of macroeconomics. Mainstream economics neglected the linkages between money, credit and debt, and the economy’s asset-liability structure—to such an extent even that in a *Bank of International Settlement* paper, Borio and Lowe (2004) could ask, ‘Should credit come back from the wilderness?’ Twelve years later, the present paper takes stock of the scope for reintegration of credit and other accounting concepts into economists’ habitat. Is there room for an accounting view in the economic conversation today?

3. Grounding the accounting view in the history of money

3.1 Money and credit

Taking an accounting view of the macroeconomy is linked to a view on the nature and genesis of money. Keynes, for instance, was deeply interested in the earliest history of money (his ‘Babylonian madness’, as he called it; see Ingham, 2009, p. 6) not only for its own sake, but to understand the nature of finance, which defines its

macroeconomic significance. A major challenge in studying money and finance, in Keynes's days as in ours, is that money is typically thought of as a 'thing'. Knowledge of the history of money helps dispel that idea, which is grounded in a strict commodity–money view. By extension, also fiat moneys and electronic money are typically analysed as if payment involves nothing but the passing on of bits of money from one economic agent to another. But money payments are also, and often only, balance sheet entries. Recognizing this leads to exploration of monetary and financial effects which otherwise remain obscured, or incidental at best. For instance, a change in a balance sheet entry implies the two-sidedness of money: money is not a thing but the symbol of a financial relation, where one person's revenues are another person's outlays and one person's capital gains are financed by another person's rise in debt. Also, since relations require governance, an accounting view brings in administrative and political aspects of money.

Therefore, if the purpose of this paper is to suggest that we ground the rethinking of money and banking in the accounting view, then this first requires grounding the accounting view in an understanding of the nature of money—a foundation which must be both empirically robust and theoretically consistent. The theoretical background to this is the *credit theory of money*, a theory about both the genesis and the nature of money.¹ Goodhart (1998) discusses two broad theories on how money historically emerged: the transactions-based account and the credit-based account. In the transactions-based view, money emerged as a means to economize on barter transaction costs. By extension, money, in this view, is still analysed as something which passively facilitates exchange processes. In the credit-based view, money emerged as credit tokens came to be used as means of payments. The best current exposition of the credit-based view is Ingham (2013, 2009). The credit theory of money is compatible with, but does not imply, the state theory of money (Knapp, 1924; Wray, 1998, 2012).

3.2 *Relevance to contemporary debates*

Since credit (and therefore debt) is a transformative force rather than a passive lubricant of real-sector processes, therefore, recognizing the credit nature of money opens up the possibility—as Schumpeter emphasized—to analyse *money itself* as a transformative force. This is a key tenet of most of heterodox economics on money and banking. Beliefs about the genesis and nature of money matter to contemporary analysis.

This relevance merits a discussion of the credit theory of money in some detail. To preserve the flow of this paper, this discussion is relegated to the [Appendix](#). The *institutional* relevance for today is that in contemporary society, banks have replaced Babylonian temples and medieval European merchants as the institutions authorized to issue money. But banks still essentially do what was always done, and money still is a category of credit. As they grant loans, banks create new credit tokens (now electronic bits) in the form of bank deposits or 'liquid liabilities', which are transferable and widely accepted as means of payment. Just as debts are created at the point where a creditor–debtor relation starts (i.e. 'out of nothing'), so banks create money 'out of nothing'—a fact which must appear mysterious when money is conceived as commodity. 'Banks actually create money when they lend it'. 'What they do when they make loans is to accept promissory notes in exchange for credits to the borrowers'

¹ This section and the [Appendix](#) draw on my unpublished paper 'banks as social accountants'.

transaction accounts. Loans (assets) and deposits (liabilities) both rise by the amount of the loan' (FRBC, 1992, pp. 3, 6). In 2014, the Bank of England issued a paper to explain that 'money today is a type of IOU' and that '[t]he reality of how money is created today differs from the description found in some economics textbooks: rather than banks receiving deposits when households save and then lending them out, bank lending creates deposits' (McLeay *et al.*, 2014).

This continuing reality of money emanating from the credit creation process is also borne out by modern theoretical and econometric research. Arestis and Sawyer (2006) discuss how credit money is endogenously created within the private sector, and how this in turn explains the effects of monetary policy better than other views of money which leave its credit nature out of account. Caporale and Howells (2001) use UK data to show with statistical causality tests in the context of a Vector Auto Regression framework that changes in loans precede and 'cause' changes in deposits. Banks extend loans, which give rise to bank deposits that are generally accepted as 'money'.

In sum, the credit theory of money redirects our attention from the physical medium of credit—which is the material token of the creditor–debtor relation—to that relation itself, the rules and laws that govern it, the uses to which it is put and the consequences in terms of macroeconomic outcomes. To adopt the credit theory of money is to take an accounting view of the genesis of money. '[T]reating money as rooted in debt (so emphasizing that every credit is mirrored in a debit)' is one of the tenets of the accounting view (Skaggs 2003, p. 377).

The historical credit theory of money, and the significance of credit creation by banks today, did not enter mainstream debates—until recently. The credit crisis, and civil society initiatives to change the money system, have brought these topics into mainstream discussions, generally by moving closer to formerly heterodox positions. The Bank of England educates the public on credit creation. The IMF has published several working papers which feature credit creation as a fact of macroeconomic significance (Benes and Kumhof, 2012; Kumhof and Jacob, 2015). This tenet of the accounting view now unites rather than divides mainstream and heterodox communities. Rather than having to start each paper with an explanation of credit creation, the debate on rethinking money and finance can now move forward. This is an important advance, and a first example of new intellectual meeting grounds.

The recognition that the money stock grows as banks and other financiers emit debt is also helpful to interpret another recent turnaround—this time, in the empirical study of macroeconomic impacts of financial development.

4. Finance and growth: new findings in light of the accounting view

4.1 *The traditional consensus*

Since the early 1990s, a large empirical literature has developed around cross-country panel data analysis of financial development. The seminal paper was King and Levine's 1993 'Finance and Growth: Schumpeter might be right'. This showed, in a sample of dozens of countries over 1960–1980, significantly positive correlations between various measures of financial development on one hand and growth in GDP per capita on the other. Since then, hundreds of papers have been written on the subject, including the landmark paper by Rajan and Zingales (1998). The state of the art is to measure the size of the financial sector by the stock of loan assets in banks scaled by GDP,

across many countries and years. Multiple regression analysis then yields conditional correlations of this measure with income growth and other macroeconomic outcomes. Taking account of a large number of control variables, these regression results yield 'stylized facts' on effects of financial-sector development (Ang, 2008). Higher income growth was one, as Levine noted in a 2005 overview article.

4.2. *New evidence and explanations*

But since the 2007 crisis and the long stagnations that followed, researchers have started to re-evaluate the evidence. Increasingly they find a negative impact of financial-sector growth on investment, innovation and income growth—not just after a crisis, but in general, across many countries and years. This has sparked an intense debate in economic journals, in policy reports by leading institutions and even in newspaper discussions. Both the IMF and the OECD issued reports which analyse negative effects of a large financial sector on a range of macroeconomic outcomes (Sahay *et al.*, 2015; Cournède *et al.*, 2015). Specifically, researchers have found threshold levels above which financial development is negatively correlated to income growth (Arcand *et al.*, 2012).

A plethora of explanations has been suggested. Beck *et al.* (2014) argue that the value-added of banking activities has shifted to non-intermediation activities, beyond traditional lending and deposit taking. By focusing on credit as a measure of financial development, recent research has missed most of the growth effect of financial development, they suggest. Beck *et al.* (2012), Bezemer *et al.* (2016) and Jordà *et al.* (2015) all point to the growth in household credit, especially household mortgage credit. They show that this correlates only weakly or even negatively to income growth. Rousseau and Wachtel (2011) write that many countries implemented financial-market liberalization in the 1990s without first having strong regulatory institutions. This, they argue, is a reason why the resulting growth of finance did not translate in income growth. Arcand *et al.* (2012) develop a formal model to show how financial-sector growth may be spurred not by opportunities for efficiency-enhancing lending, but by the expectation of a bailout. This results in a financial sector which is larger than is socially optimal. Cecchetti *et al.* (2011) explore data which suggest that especially innovative, R&D-intensive industries receive less credit during a credit boom, when banks increase their lending to property and financial markets. Cecchetti and Kharroubi (2013) complement this with a formal model showing how 'financiers' may tease highly educated workers away from innovative sectors into finance—the proverbial engineer turned floor trader.

4.3 *The accounting view and the new findings*

Some of these findings endorse an accounting view of the economy, especially the distinction between types of credit, which was absent before the crisis. This is encouraging of bringing in other elements of an accounting view to understand better how the effect of financial development may have turned from positive to negative.

To be sure, the possibility of a negative impact itself is not new at all. It was always implied in heterodox views ranging from Hilferding's (1910) dim view of high finance to Keynes's longing for the 'euthanasia of the rentier', and from Henry George's (1879) analysis of property speculation to contemporary studies on financialization

(Krippner, 2005; Epstein, 2005; Palley, 2013) and on credit boosting asset prices and debt, rather than GDP and living standards (Werner, 2005). In fact, what unites these views is a distinction between productive and unproductive, or outright extractive, forms of finance. As noted, this distinction was absent until very recently from mainstream empirical analyses. For, despite the seeming adherence to Schumpeterian economics even in the title of King and Levine's 'Finance and Growth: Schumpeter might be right', the empirical literature until recently neglected the three characteristic features of the accounting view, outlined in Section 2. They are also characteristic of Schumpeter's work, as will now be discussed in detail.

The first feature is to distinguish between the uses of credit. In *Business Cycles*, Schumpeter (1939) drew a sharp conceptual line between what he called the 'primary' and 'secondary' credit waves. The first finances 'innovations embodied in new plant and equipment' (p. 145), while 'the processes of the secondary wave, in fact, supply us with plenty of instances of unproductive loans' (p. 146). Among the examples, Schumpeter included household loans and speculative property loans. As noted, some recent finance-growth findings are in line with this distinction, and this is new.

The second issue is to distinguish between flows of credit—which finance new spending—and stocks of credit—which signify deeper, more developed financial markets. It is the latter that Schumpeter was concerned with; but modern research conflates it with the former. In Chapter 11 of *Business Cycles*, Schumpeter warns against 'misleading associations' that may arise when we focus on the 'mechanical relation' between loans and the expenditures financed by the loans. To treat credit as 'the source of expenditures', in Schumpeter's view, does nothing to help us understand the process of economic development and of the business cycle. 'We are not moving closer to the origin of the cyclical process but, on the contrary, away from it' (Schumpeter, 1939, p. 578).

In current empirical research, financial development is a positive term used for the growth of the financial sector, equivalent to financial 'deepening' (Shaw, 1973). It is measured by the stock of credit scaled by GDP. But since last period's flows are included in this period's stock, observing only changes in the stock of credit conflates stock effects and flow effects. It is true by definition—indeed, it is a 'mechanical' relation, as Schumpeter called it—that new credit boosts spending. We may call this a 'liquidity' effect. But this need not involve any financial deepening. Credit provides liquidity to be spent; but the nature of that spending determines any longer-term effect on the economy's development and cyclicity. This is the true 'financial development' effect—which may be positive (Shaw's [1973] 'financial deepening' scenario) or negative (the 'financialization' scenario). In either case, it is a stock effect, not a flow effect. To confuse the two is to overstate financial development effects. In empirical work, we found that the positive effect of credit growth on incomes is indeed much diminished once correcting for this 'liquidity' effect of current purchasing power embodied in current credit flows (see Bezemer *et al.* [2016] for a sample of countries, and Bezemer and Zhang [in press] for China). Another study confirming separate effects of stocks and flows is Biggs *et al.* (2010), although outright negative effects on income of credit growth are not possible in their Ramsey-model analysis. In reality, they are possible, as the empirical literature suggests. Lavoie (2008) shows theoretically how financialization can be bad for growth in a stock-flow consistent model.

The third tenet of the accounting view is to trace the effects of debt growth as the accounting counterpart of credit growth. A key feature of Schumpeter's business

cycle theory is that credit created in the 'secondary' wave results in 'overindebtedness' (Schumpeter 1939, p. 123). This simple accounting equality (growth in credit is growth in debt) may go a long way towards explaining the negative effect of financial development on growth in the recent literature. If financial development is measured as an increase in the credit-to-GDP ratio, then the fact that credit is also debt means that a rise in the ratio of private debt to GDP is implied in financial development. Hence, with growth in credit-to-GDP ratios, the benefits of more credit will at some point be overtaken by the costs of more debt. Starting from this basic framework, one can further consider which kinds of credit growth (business loans, household mortgages and so on) are likely to lead to larger benefits of credit or larger burdens of debt (for an early empirical application to Japan, see Werner [2005]). This distinction is taken up in the recent literature, as we saw, but the effect of the debt growth implied in financial development is not. Instead, there are competing explanations, reviewed above, many of which apply to specific settings (Rousseau and Wachtel, 2011) or require quite specific assumptions (Arcand *et al.*, 2012; Cecchetti and Kharroubi, 2013). Thus, an accounting view on financial development may both support the new evidence and simplify its interpretation.

5. Macro-models missing money

5.1 Mainstream models and their discontent

Also in theoretical macroeconomics there was recently a turnaround in consensus, which promises an opening for orthodox and heterodox scholars to agree on an accounting view of economics. The current incarnation of the neoclassical multi-market equilibrium model, known as the 'Dynamic Stochastic General Equilibrium' (or DSGE) model, has come in for heavy criticism. These models, expressing the 'New-Keynesian' macroeconomic paradigm, are widely used in academia (De Grauwe, 2010), international institutions such as the IMF (Botman *et al.*, 2007), central banks (Smets and Wouters, 2003; Sbordone *et al.*, 2010), and macroeconomics PhD program curricula (An and Schorfheide, 2007). In DSGE models (e.g. Christiano *et al.*, 2005), 'agents' representing firms and households decide on equilibrium values of investment and consumption, based on their preferences, technologies and budget constraints. Agents have no balance sheets, and a financial sector and bank credit creation are not modelled. There are no sectoral or industrial networks (since there is only one agent) and therefore the economy's structure is irrelevant to outcomes. DSGE models abstract from financial flows. The only financial flow variable is the interest rate, but it is endogenous to the real sector: its value is determined via the Taylor rule, linked to the output gap and inflationary expectations.

Since the crisis, the usefulness of DSGE models has become contested. Oliver Blanchard wrote that '[t]he workhorse New Keynesian dynamic stochastic general equilibrium (DSGE) models on which we were concentrating so much of our attention have been of minimal value in addressing the greatest macroeconomic crisis in three-quarters of a century' (Romer and Spence, 2012). Some heroic assumptions were relaxed in a new generation of models since 2009 (Den Haan, 2014; Wickens, 2010), introducing different types of agents, a financial sector as a 'friction' in prices, and agents with limited rationality or with balance sheets (Brunnermeier and Sannikov, 2014). Still, this leaves many feeling that the models are not sufficiently realistic.

A flurry of recent critical publications (Cabellero, 2010; White, 2009; Krugman, 2009) suggest that we need to go ‘beyond DSGE models toward an empirically based macroeconomics’ (Colander *et al.*, 2008). The question remains whether ‘stable-with-friction models’ which can reproduce the past are also capable of providing insight into the causes of e.g. unemployment and financial instability. Quite apart from the much-discussed behavioural assumption, a different problem is that the latest models may still not be *financially* realistic—there are no balance sheets and no serious role for debt and for different kinds of assets in shaping macroeconomic dynamics. Mervyn King, former Governor of the Bank of England, noted in a 2011 speech that ‘the basic New Keynesian model omits a number of key factors ... it lacks an account of financial intermediation, so money, credit and banking play no meaningful role’ (King, 2011).

These omissions, rather than only the behavioural assumptions, were arguably a major reason why the 2008 financial crisis was so unexpected, and conversely, why those who did ‘see it coming’ did not adhere to the neoclassical neglect of credit, debt and accounting (Bezemer, 2010). Precisely because it was a credit crisis, and credit is absent from most models used by macroeconomists, in central banks and by policymakers, the crisis was largely unforeseen. A key reason is that the institution of credit money is incompatible with multi-market equilibrium models—a problem nicely summarized in the title of Frank Hahn’s 1965 paper ‘On some problems of proving the existence of an equilibrium in a monetary economy’. In terms of incorporating money and finance, the best that can be done is to include a numéraire money. This is where the numéraire money of theoretical models and the commodity money of mainstream money history meet: both dispense with the need to discuss credit, debt and politics, as Goodhart (1998) argues.

5.2 *Mainstream responses*

Post-crisis, the problem of models without money is as relevant as ever. The difference is that this is now widely perceived as a problem. A recent attempt to address it is Brunnermeier and Sannikov’s (2014) ‘A macroeconomic model with a financial sector’, published in the *American Economic Review*. The title suggests that equilibrium models can include credit creation, debt buildup, balance sheets and endogenous financial dynamics into their structure. But the model turns out to be very far from this. It features two types of agents: ‘households’ and more productive ‘experts’. Both hold capital and produce. Experts issue risk-free debt to households and buy capital. This lending may or may not run through banks as intermediaries, so banks are again dispensable in the model. The ‘financial sector’ dimension is instead that the household may lend to the firm. This is fundamentally different from credit creation by banks. The model excludes a financial sector with its own dynamic and the possibility that debt levels have an impact on output levels. Another problem is that this and similar models may not be stock-flow consistent: in equilibrium, there are positive net payment flows from households to experts, which is not possible unless households continuously borrow—which in the model they do not since there is no credit creation. Put starkly, a Brunnermeier–Sannikov economy (and the class of models it represents) cannot exist in financial reality.

5.3 *Alternatives*

These problems of omission were precisely the reasons for the development of stock-flow consistent models over the last few decades (as Godley and Lavoie, 2006, explain in their

Introduction). These models introduce the financial elements missing in mainstream models (for an overview, see [Caverzasi and Godin, 2015](#)). They also help the researcher to 'avoid equilibrium analysis, but rather think in terms of unfolding processes' ([Skaggs, 2003](#), p. 377), and this places them squarely in the accounting view. The current dissatisfaction within mainstream economics with the hegemony of DSGE models could be their biggest opportunity for wider acceptance yet, as argued in [Bezemer \(2010\)](#).

A possible stumbling block to this is that stock-flow consistent models provide a macro-accounting framework which can be simulated, but they do not provide an explicit modelling of micro-behaviour. Even without this, analysis with stock-flow consistent models provides key lessons—for instance, on the importance of housing markets ([Zeza, 2008](#)) or the consequences of monetary union ([Godley and Lavoie, 2007](#))—which do not depend on microeconomic modelling. But to the extent that macroeconomic dynamics are shaped by interactions between microeconomic units—banks, firms, households—simulations of stock-flow consistent models run the risk of oversimplifying dynamics. Complexity science shows that interactions between a system's parts produce emergent properties and sudden transitions ('tipping points') which cannot be modelled using either only macro-level or only micro-level relations ([Scheffer, 2009](#)). This poses a problem for so-called 'micro-founded' DGSE models as well as for macro-level stock-flow consistent models.

A recent response to this challenge has been to populate the macro-level accounting framework with firms, households, banks and governments in an agent-based model. This methodology borrows from evolutionary biology ([Axelrod, 2006](#)) and is part of the 'tool box' of evolutionary economics ([Safarzyńska and van den Bergh, 2010](#)). Agent-based modelling within a financial accounting structure allows researchers to analyse how macro-level outcomes are the result of agents' properties (e.g. their solvability) and behaviour (e.g. saving or investing) plus their interactions (e.g. 'my savings decreases your revenues'). These outcomes are neither identical to micro-level decisions (as in DSGE models), nor do they follow directly from macro-level relations (as in traditional Post-Keynesian stock/flow models). By combining the stock/flow and agent-based methodologies, one can analyse the *emergent properties* of the *financial* economy—two important advances on mainstream models.

There are still relatively few models in this new strand. Published examples include the 'Eurace' model, a massively large-scale agent-based model and simulator ([Deissenberg et al., 2008](#); [Cincinotti et al., 2010](#)) and the 'Complexity Research Initiative for Systemic Instabilities' (CRISIS) model ([Gualdi et al., 2015](#)), which has heterogeneous households, firms, banks and policymakers. Analyses with these models show that small perturbations may have large macroeconomic effects, in contrast to DSGE model outcomes. This also follows from work with the 'Schumpeter + Keynes' model developed by [Dosi et al.](#) (e.g. 2010) as well as the 'Java Macro Agent Based' model by [Caiani et al. \(2015\)](#). This adds a financial sector and Minsky-type financial dynamics to a Keynesian/Schumpeterian growth model, with heterogeneous firms, a labour force, banks, a government, and a central bank. Unlike DSGE models, it can replicate many stylized macroeconomic trends and correlations observed in reality.

In sum, also in the area of theoretical macroeconomics, a recent and quite radical change in the consensus on DSGE models provides an opportunity for a meeting of minds between orthodox and heterodox economists. Again, the meeting ground could well be an accounting view of macroeconomic analysis. Models which operationalize

this view are already available. Given the dissatisfaction with ‘missing money’ on both sides of the divide, and the fact that the development of evolutionary, agent-based models grounded in complexity science is accelerating, prospects for a pluralist conversation on macroeconomic models are better than they have been in decades.

6. Further applications and policy implications

The thrust of this paper has been to argue that three recent examples of a change in consensus within mainstream economics provide many opportunities for meaningful conversations between heterodox and orthodox economists. Further, it was argued that it is promising to structure this debate by adopting a pluralist but well-defined ‘accounting view’ of economic analysis. In this section, I explore the potential for extending this approach and suggest several policy implications. I then conclude with reflections on paradigms and plurality.

6.1 *Income inequality*

A first additional field where an accounting view appears promising as a common framework is income inequality. Again, this is a traditional heterodox concern, but it has now also taken centre stage in the mainstream debate, with an important role for balance sheet issues around debt growth and capital gains, as well as distinctions between financial and real assets. Since the late 1980s, levels of income inequality have risen substantially in most OECD countries and top incomes have raced away (Atkinson *et al.*, 2011). Piketty (2014) identifies redistribution of income between wage earners and owners of capital as a key reason—where ‘capital’ comprises physical production assets as well as real estate and financial assets. The growth of the value of capital is therefore intimately connected with the growth of the financial sector, which creates and trades financial assets, and with rising real estate values. While these are traditional heterodox concerns, there is startlingly little empirical research in mainstream economics on the impact of these dimensions of financial development on income inequality in rich economies (though see Galor and Zeira, 1993; Gimet and Lagoarde-Sego, 2011; Demircuc-Kunt and Levine, 2009).

One reason is that mainstream theoretical models suggest that if anything, financial development, by making capital more widely available, should alleviate income inequality. Here, the alternative perspective might be helpful, which views financial development as ‘financialization’ (Epstein, 2005; Palley, 2013), supporting growth in financial rather than productive assets and resulting in capital gains and debt growth, rather than investment and income growth (Mazzucato and Wray, 2015). This literature—which remained academically marginal until the 2007 crisis—finds e.g. that ‘the growth of the U.S. financial sector has contributed to the exacerbation of inequality in recent decades’ (Van Arnum and Naples, 2013). Recently, OECD researchers also reported that financial expansion have stifled income growth of many low- and middle-income households, exacerbating income inequality (Denk and Cornède, 2015). Kus (2012), focusing on capital gains dimensions of financial development (e.g. stock market valuations), finds that capital gains combined with changes in labour market institutions, unemployment, globalization and social spending increased income inequality in OECD economies over 1995–2007. Roine and Waldenstrom (2012) analyse Swedish micro-data and report that capital gains increased Swedish income inequality.

Causation may be bi-directional: some studies show that rising income inequality constrains effective demand (Carrol *et al.*, 2014) and thereby economic growth. This may be a driving force in the growth of lending and increasing indebtedness of households in Western economies, especially the USA (Coibion *et al.* 2014; Onaran *et al.*, 2011). It may therefore be one cause of the 2007 crisis (Stockhammer, 2013). The financial sector's assets are also firms' and households' liabilities, which shape their income growth and financial fragility. Taking into account the effects of liabilities as well as assets may therefore help better understand macroeconomic effects of financial development.

All this shows the extent to which heterodox and orthodox researchers are now concerned with the same topics. Bi-directional causality (or perhaps cumulative causation) and the interwovenness of assets and liabilities sit well in an accounting view of the economy. Operationally, they can be accommodated in stock-flow consistent, agent-based models (Kinsella *et al.*, 2011). Thus, the study of inequality may also be a promising meeting ground.

6.2 Financial fragility

A second example is fragility and crisis. Whereas once 'fragility' was a term used only by Minsky specialists, interest in the concept is now booming in mainstream journals. A search in the 'Econlit' articles database reveals that over the eight years 2007–2014, 225 academic journal articles were published with the words 'financial' and 'fragility' in the abstract. In the eight years before that (1999–2006), this was 123. Until 2007, financial development was widely credited with increasing financial stability, even 'eliminating risks' (Das, 2006). There are now dozens of empirical studies which link financial development to larger probability of subsequent financial crisis and more severe recessions (we survey them in Zhang and Bezemer [in press]).

Recent work connects this to the increase in leverage (the rise in liabilities) that financial development implies—especially if credit is extended against assets already in place, such as commercial and residential property and financial assets (Bezemer, 2014; Turner, 2015; Bezemer and Hudson, in press). These lending flows have grown much faster than flows of lending to support investment innovation. They have been increasing the ratio of financial obligations (interest, repayment and fees) to income, and the volatility of payment flows (Fazzari and Cynamon, 2008; Tymoigne, 2014).

Financial fragility is by definition dynamic, playing out over time: credit growth tends to boost aggregate demand and growth in the short run, while increasing crisis probability in the medium run (Russo *et al.*, in press). Fragility arises from interactions between economic agents. The growth of business output becomes more dependent on bank finance during a real estate boom, creating vulnerabilities when real estate prices fall. It is difficult to capture these dynamic causal mechanisms in statistical analysis. But in the work that has been done, it is again the growth in debt—especially household debt—which correlates to fragility and crisis. Again, this provides ample opportunity to apply an accounting view, which studies the economy as an unfolding process rather than as static, and which focuses on its asset/liability structure.

6.3 Policy implications

Although this paper is not about policy, it would go amiss if some policy implications of the accounting view were not noted at least. Consider the following instances.

Accounting-view models in the stock-flow consistent tradition were proven to be more helpful in identifying financial fragility before the 2007 crisis (Bezemer, 2010) than mainstream models. Macro-prudential concerns over balance sheets were a constant focus of attention in this tradition, rather than emerging years after the crisis. This should inspire their broader application in forecasting and scenario building by macroeconomic analysts, and analysis in central banks.

An accounting view of post-crisis balance sheet recessions leads to markedly different policy than the quantitative easing initiatives which started in Japan in the 1990 and which are still ongoing in Europe and the USA. Much less would have been expected from bond-buying which merely increases banks' reserve levels; far more attention would have been given to addressing high private debt levels as the cause for stagnation.

An accounting view on public balance sheets creates the analytical space to consider the effect of government deficits not as equivalent to original sin but rather in a 'functional finance' manner. Conducting the policy debate about the correct fiscal stance on the basis of the full (but stylized) accounts of the economy would have highlighted several issues which are only now beginning to emerge in the public debate. These include the private debt growth implied in public deficits in current account deficit economies (since the sum of sectoral balance sheets must sum to zero—something which stock-flow consistent models make explicit); the sheer levels of private debt, in comparison to which public debt levels pale; and the nature of public debt as a current swap of assets for liabilities, rather than as a future burden on income, except at very high levels. It is plausible that an accounting view of the economy would have sensitized policymakers to the consequences of austerity policies beyond a 'first the pain then the gain' mode of thinking.

An accounting view approach to the analysis of financial-development effects enables policymakers to distinguish between productive and unproductive uses of credit, and the results for private debt growth. This may underpin financial policies that give banks incentives to create loans which support income generation, not capital gains. It is clear that the list is much longer, since the accounting view is a generic mode of analysis, applicable to a wide range of policy questions.

In each of the above areas, consensus has now swung towards positions which were taken before the crisis only by analysts working in some variety of the accounting view tradition—witness current macro-prudential central bank concerns; disenchantment with the effect of quantitative easing and fiscal contraction; and the new Basel rules differentiating between mortgages and business loans on banks' balance sheets. Also in the policy arena, this appears a good time to seek a common meeting ground defined by an accounting view of macroeconomic challenges.

7. Concluding remarks: from paradigm to plurality

So wither economics of money and banking? None of the problems that neoclassical models and modes of empirical analysis face are new; all have been the subject of debate for decades, some for over a century now. But many feel that these issues have taken on a new significance in our time—because of the unprecedented hegemony of DSGE-style macroeconomics since the 1980s, because of the credit crisis and global recession, and because of the new empirical findings, often discussed without

any connection to a rich heterodox literature. Is the solution a 'New Paradigm for Macroeconomics', as several books have proposed even in their titles (Stiglitz and Greenwald, 2003; Werner, 2005)? Or is economics' fundamental problem not with its ruling paradigm—weak though it is, to be sure, when it comes to the financial nature of our economy—but with the hegemony of that paradigm? General-equilibrium models are good at some things and bad at others.

The response in the profession should be (i) to recognize the shortcomings of the current paradigm and (ii) to allow other approaches to be debated, taught, published and used in policy analyses and forecasting. The first of these two steps has been taken, as exemplified in this paper. The second appears to be gaining ground, and awaits the active participation of many heterodox scholars. This is not paradigm change; it is the introduction of plurality. An outsider might think plurality is quite a modest aim in comparison to paradigm change. But insiders to academic economics know that plurality would already be a revolution, especially in theoretical macroeconomics.

In order for the profession to become receptive to pluralism, it needs three things. The first is a spectacular failure of its paradigm, leading to serious questioning and pressure for change. This has now been happening for nine years. The second is an understanding of the paradigm's shortcomings. These have been well known and thoroughly discussed in heterodox circles for decades, and that discussion is now permeating to the rest of the profession. The third is a vision of where solutions might be found and the setting of new research agendas. This paper is offered as a contribution.

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Appendix. *The credit theory of money*

The proposition that money emerged when credit tokens came to be used as means of payments goes against a widely held belief, based on textbook economics, that money historically emerged when some commodity (e.g. shells or silver lumps) came to be used as a convenient unit of account to replace the cruder barter trade; and that the use of credit and debt was an optional extra, predicated on the prior existence of money. This convenient pedagogical narrative has been taught since times immemorial—at least since Aristotle, as Ingham (2009) recounts. Nineteenth-century German textbooks made it part of the standard economics curriculum. But if assessed as actual financial history, there is little historical or ethnographic evidence to support it.

There are good reasons (some of them reviewed by Wray, 1998) why it is nonetheless a popular and persistent fable in economics. Money as a commodity fits hand-in-glove with a neoclassical view of the world, where everything is either input or output or price. Credit and debt is neither, and *ad nihilo* credit creation fits uneasily (if at all) into equilibrium models.

Instead, consider evidence from the 'archeology of money' in favour of the credit origin of money. This comprises research in archeology, anthropology and numismatics—see e.g. Wray (1998), Ingham (2004) and Hudson and Van de Mierop (2002), building on early seminal contributions by Knapp ([1924] 1973) and Mitchell Innes (1914), as summarized well in Wray (2004). Keynes (1930, p. 3) followed these authors when he wrote that money 'comes into existence along with debts'. A major argument for this position is logical. It is that specialization of labour—which characterized societies

as early as the Mesolithic age—must have implied credit relations. Specialization of labour and the attendant exchange of goods (e.g. between hunters, toolmakers and gatherers) requires a social mechanism to bridge the time between delivery of the various goods. A hunter needs bow and arrow from the toolmaker before he can hunt and deliver meat in return. In the meantime, the hunter is a debtor as he owes the toolmaker, who is a creditor. In societies also involving farmers, bakers and so on, the web of debtor–creditor relations quickly becomes complex.² Such relations would therefore have been recorded in some way. Unlike the transactions-based theory of money’s genesis, this is not just another pedagogical narrative, or speculation on how things might have been. Archeologists have found notched bones from Stone Age hunter–gatherer societies, where the notches have been interpreted by scholars as primeval accounting systems (Gardiner, 2004).

Also highly developed ancient civilizations had credit money. For instance, from the temple ruins of the ancient Babylonian and Sumerian civilisations (from 3,000 to 2,000 BC) have been recovered thousands of clay tablets (called *shubati*, meaning ‘received’) which are receipts for grain deliveries to the temple (in payment of taxes to the temple-state elite). They record the sender’s and receiver’s names, the quantity and the date. In striking analogy to modern double-entry accounting methods, many of these tablets were sealed in cases inscribed with the same information. These tax receipts are the oldest IOUs we know of, and like bills of exchange used in later times, these cases and their contents were ‘signed and sealed documents and passed from hand to hand’ (Innes, 1914, p. 35). When the debt described on the case was cleared, it was broken. Archeologists have, however, recovered many such cases intact, indicating that, just like the outstanding stock of money in our economic system, their primary use had become to facilitate transactions, not to settle debt. They were tradable and functioned as a means of payment, their value determined by the authorities by setting tax levels. In short, these IOUs were money, long before coins were introduced to Babylonia and Persia by Alexander the Great in 331 BC (Hudson, 2004).

So it was in Europe, where since the earliest times accounting tokens of creditor–debtor relations were used as money, i.e. to settle transactions of goods and services. In many mediaeval European societies, the form this took was the square wooden stick with notches, or tally (Wray, 1998, p. 41). It was created when a buyer became a debtor to a seller. Their names, with the date, were written on opposite sides of the stick. Then the stick was split down the middle but stopped about an inch from the base. Thus there were two smaller sticks with equal numbers of notches, one (called the ‘stock’ and retained by the creditor) longer than the other (the ‘stub’, held by the debtor). Stock and stub could always be matched to ensure they had not been tampered with, and to ascertain the debt to be paid. Again, it is obvious that tallies, like Sumerian *shubatis*, were a form of double-entry bookkeeping. And they likewise circulated as a means of payment. Innes (1914) recounts how well-known mediaeval fairs such as St. Giles in Winchester or Champagne and Brie in France were primarily clearinghouses, where merchants came to clear their tally stocks and stubs.

² The Bank of England in 2014 adopted a variation on this explanation of the origin of money, in <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q1prereleasemoneyintro.pdf>.

If wooden tallies were used also in ancient times, they have not been preserved. There is other evidence, however, that tallies in one form or another were widespread throughout ancient and prehistoric Europe. For instance, copper pieces purposely broken like jigsaw puzzle pieces in analogy to stock and stub have been found in Italy, dating from between 1000 and 2000 BC (Wray, 1998). Again, there is no evidence for the use of coins until centuries later: debt preceded money.

Graeber's (2012) fascinating history of debt shows how also in non-European societies, debts were central to social organization. Once African and Asian non-market societies came in contact with Europeans through trade, such traditional debt tokens often became means of payments, turning from debt into money. The conclusion is that credit cannot have evolved from token money, because credit chronologically preceded it. Historically, tax debts and trade debts were monetized as debt tokens became transferrable and circulated as medium of payment, ultimately in the form of coins, notes and electronic bits. This suggests we should analyse debt structures, not their representations in clay tables, wooden sticks, coins and notes, or computers. This provides the underpinning for a focus in analysing the relation between financial sector and the macroeconomy on the whole of the economy's credit structure, and not only on money, which is but a part of it.