



UNIVERSITY OF LEEDS

This is a repository copy of *The Role of Commercial Banks and Financial Intermediaries in the New Consensus Macroeconomics (NCM): A Preliminary and Critical Appraisal of Old and New Models*.

White Rose Research Online URL for this paper:
<http://eprints.whiterose.ac.uk/137332/>

Version: Accepted Version

Book Section:

Fontana, G orcid.org/0000-0002-8055-5326 and Passarella, MV orcid.org/0000-0001-7652-5952 (2018) The Role of Commercial Banks and Financial Intermediaries in the New Consensus Macroeconomics (NCM): A Preliminary and Critical Appraisal of Old and New Models. In: Arestis, P, (ed.) *Alternative Approaches in Macroeconomics: Essays in Honour of John McCombie*. Palgrave Macmillan , Cham, Switzerland , pp. 77-103. ISBN 978-3-319-69676-8

https://doi.org/10.1007/978-3-319-69676-8_4

© The Author(s) 2018. This is an author produced version of a chapter published in *Alternative Approaches in Macroeconomics*. Uploaded in accordance with the publisher's self-archiving policy.

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

THE ROLE OF COMMERCIAL BANKS AND FINANCIAL INTERMEDIARIES IN THE NEW CONSENSUS MACROECONOMICS (NCM): A PRELIMINARY AND CRITICAL APPRAISAL OF OLD AND NEW MODELS

Giuseppe Fontana, University of Leeds, UK, and University of Sannio, Italy, and Marco Veronese Passarella, University of Leeds, UK

1. Introduction¹

The early 1990s were marked by a convergence of views in mainstream macroeconomics. That convergence gave rise to the so-called ‘New Consensus in Macroeconomics’ (NCM hereafter), which conquered the academic world, central banks and other major policy-making institutions around the world (Arestis, 2007; Tovar, 2009; Woodford, 2009). The NCM was regarded as a ‘new neoclassical synthesis’ incorporating important elements of both New Keynesian economics and Real Business Cycle economics (Goodfriend and King, 1997; Goodfriend, 2004; Dixon, 2008; Fontana, 2009b; McCombie and Pike, 2013). In 2000 John Taylor, a leading contributor to the development of this new macroeconomics paradigm, listed the most original features of the NCM:

“First, the long-run real GDP trend, or potential GDP, can be understood using the growth model that was first developed by Robert Solow and that has now been extended to make ‘technology’ explicitly endogenous. Second, there is no long run trade-off between inflation and unemployment, so that monetary policy affects inflation, but is otherwise neutral with respect to real variables in the long run. Third, there is a short run trade-off between inflation and unemployment with significant implications for economic fluctuations around the trend of potential GDP; the trade-off is due largely to temporarily sticky prices and wages. Fourth, expectations of inflation and of future policy decisions are endogenous and quantitatively significant. Fifth, monetary policy decisions are best thought of as rules, or reaction functions, in which the short-term nominal interest rate (the instrument of policy) is adjusted in reaction to economic events” (Taylor, 2000, p. 90).

Much has happened between 2000 and today, including a world-wide dramatic financial and banking crisis, a consequent devastating recession, and a prolonged stagnation period, which continues today. There is now a unanimous consensus in the economic profession that commercial banks (banks for short) and financial intermediaries are at heart of these remarkable economic events. Therefore, it may seem odd that Taylor (2000) does not mention banks and financial intermediaries among the most original features of the NCM. It was not a mistake or oversight of the paper. Banks and financial institutions were rarely mentioned, let alone modelled, in the original NCM model (e.g. Woodford, 2003; see, also, for a critical analysis, Goodhart, 2010). This is really extraordinary vis-à-vis the fact that the NCM model was enthusiastically adopted by most central banks and treasuries around the world (see, for example, Adolfson et al., 2007; Smet and Wouters, 2003 and 2007; Tovar 2009). Yet, some interesting attempts to account for banks and financial institutions in mainstream macroeconomics modelling were made in the early 1980s. The so-called ‘financial accelerator mechanism’ (FAM hereafter) literature pioneered by Ben Bernanke

¹ The authors acknowledge support from the project Financialisation, Economy, Society and Sustainable Development (FESSUD), which has received funding from the European Union Seventh Framework Programme (FP7/2007–2013) under Grant Agreement No. 266800. The authors are grateful to Philip Arestis and Malcolm Sawyer for useful comments and suggestions on an early draft of this chapter. The usual disclaimers apply.

(Bernanke, 1981, 1983; Bernanke and Gertler 1989) analysed the role of banking and financial frictions as triggers or amplifiers of the business cycle. The FAM literature has been rediscovered after the 2007-2008 financial crisis. It has been used to amend the NCM model to account for the nature and role of banks and financial intermediaries in modern economies (see, among others, Christiano et al. 2013, Del Negro et al. 2014).

The purpose of this chapter is to offer a preliminary and critical review of the progress made in mainstream macroeconomics in the last two-three decades. Did really the NCM model ignore banks and financial intermediaries? Are the core theoretical propositions of the NCM unable to explain some important features of real-world economies, and especially the remarkable economic events of the last decade? And how the insights and results of the FAM literature have been encompassed into the NCM model? What are the prospects, if any, for the new NCM cum FAM model to explain the nature and role of banks and financial intermediaries in modern economies? These are some of the main questions that this chapter tries to answer.

The chapter is organised as follows. Section 2 presents the three-equation model describing the macroeconomic core of the NCM in a closed economy, the so-called benchmark NCM model. It highlights the nature and role of the ‘rational expectations hypothesis’ (REH hereafter), and the concept of the ‘natural equilibrium’ in the benchmark NCM model. It also proposes an amended version of the latter, which takes into account criticisms raised against the use of the REH and NE in the NCM. The so-called ‘augmented NCM model’ allows for the possibility of interdependence between aggregate demand and aggregate supply, a hallmark of real-world economies captured by demand-led Post Keynesian economics models (Setterfield, 2002 and 2010; Fontana, 2009a, 2010; Palacio-Vera, 2009), via some hysteresis effects. Section 3 reviews the core features and main results of the FAM literature, and presents a simple set of equations describing the ‘benchmark FAM model’. It also draws attention to the nature and role of banks and financial intermediaries in the latter model. Furthermore, it proposes an augmented NCM cum FAM model (‘augmented FAM model’, for short), which allows for hysteresis effects. A table summarises all models discussed in the chapter, namely the benchmark NCM model, the augmented NCM model, the benchmark FAM model, and the augmented FAM model. Section 4 assesses the current state of mainstream macroeconomics. It reviews many attempts that have been made to amend the NCM model in order to fix its failure to explain the remarkable economic events of the last decade. It highlights how the absence of banks and financial intermediaries, and systematic errors in inflation forecasting, have been accounted for in the new augmented FAM model. It also discusses the inability of the latter to allow for the possibility that financial instability is an endogenous by-product of the normal functioning of modern economies. Furthermore, it considers the monetary policy implications of the augmented FAM model, including the possibility of replacing the dominant price stability goal with an alternative financial stability goal, which aims to stabilise the market value of private and public financial assets. Finally, Section 5 offers some final remarks.

2. A Critical Analysis of the Benchmark NCM Model

The macroeconomic core of the NCM can be described through three reduced-form (or aggregate) equations, namely an aggregate demand equation, an inflation equation, and an interest rate rule. Each macroeconomic equation is in turn strictly microeconomics-founded, i.e. every relationship

among aggregate magnitudes is derived from the constrained inter-temporal optimization of an individual utility function. This function underpins the behaviour of a single, sovereign, completely rational representative agent with perfect foresight, who maximises its utility over an infinite horizon by combining labour supply/leisure time and consumption/saving in each period. McCombie and Pike (2013) label these features the ‘paradigmatic heuristics’ or ‘pseudo-assumptions’ of the NCM model (see also McCombie and Negru, 2014, who explore the general question of paradigm-dependent economic theories).

In simple algebraic terms, the reduced-form benchmark model can be represented as it follows (Clarida et al., 1999; De Grauwe, 2010; see, for a critical assessment of it, Arestis, 2007, 2009; Arestis and Sawyer, 2004, 2006, 2008):

$$\begin{aligned}
 (1) \quad & Y_t^g = a_0 + a_1 Y_{t-1}^g + a_2 E(Y_{t+1}^g) - a_3 [r_t - E(\pi_{t+1})] + \varepsilon_1 \\
 (2) \quad & \pi_t = b_1 Y_t^g + b_2 \pi_{t-1} + b_3 E(\pi_{t+1}) + \varepsilon_2 \\
 (3) \quad & r_t = (1 - c_3) [RR_t^* + E(\pi_{t+1}) + c_1 Y_{t-1}^g + c_2 (\pi_{t-1} - \pi^T)] + c_3 r_{t-1} + \varepsilon_3
 \end{aligned}$$

where Y_t^g is the current output gap, π_t is the current inflation rate, π^T is the target inflation rate, r_t is the current nominal interest rate, RR_t^* is the natural or optimal real interest rate, $E(\cdot)$ defines future expected values, $a_0, a_1, a_2, a_3, b_1, c_1, c_2 > 0$, $(b_2 + b_3) = 1$, and $0 < c_3 < 1$.²

Equation (1) corresponds to the old IS curve, and is grounded on the separation between aggregate demand and aggregate supply, with the (growth of) natural output being supply-determined and independent of the level, and rate of change, of aggregate demand (Fontana, 2010). It shows that the output gap – i.e. the difference between the (logarithm of) actual output and its ‘natural’ or potential or long-run level – depends negatively on the expected real interest rate. The output gap depends also positively on the past and expected future output gaps. Equation (2) corresponds to the ‘accelerationist’ (or expectations-augmented, New Keynesian) Phillips curve, acting as the aggregate supply function. It shows that the inflation rate depends positively on the output gap (and also on the past inflation and the expected future inflation), signalling demand pressures. For this reason, it is sometimes called the ‘inflation-adjustment (IA) line’ (e.g. Romer, 2000; Taylor, 2000). Equation (2) can be considered as the equivalent of the NAIRU principle (e.g. Lavoie, 2006, p. 169): the inflation rate accelerates whenever the actual (growth rate of) demand and output exceeds the natural (rate of growth of) output. Equation (3) is the monetary policy rule or the reaction function of the central bank. It incorporates the well-known ‘Taylor rule’ (e.g. Taylor, 1993, 1999), according to which changes in the nominal interest rate set by the central bank is a positive function of the ‘natural’ real interest rate, the expected future inflation rate, the past output gap, and the past inflation gap (i.e. the deviation of the actual inflation in previous period from its target value). In formal terms, it is usually derived from the minimisation of the ‘loss function’ of the central bank,

² The values of the ‘deep parameters’ of the NCM and related DSGE models, i.e. the parameters which are supposed not to be affected by policy, are usually obtained through either ‘calibration’ methods or Bayesian estimation econometric techniques (Tovar, 2009).

where the losses for each period are a weighted average in quadratic terms of the deviation of inflation from its target rate, and of current output relative to its potential level (Woodford, 2003, p. 381). Since prices are supposed to be sticky in the short-run, and changes in expected inflation are taken into account, when steering the nominal rate, the central bank is effectively setting the real interest rate (Romer, 2000, p. 155).

Two points are worthy to mention here. First, the interest rate policy rule replaces the traditional LM curve in the IS-LM-AS model, along with its assumption that the central bank targets the money supply. In the NCM the central bank is able to influence the short-run real interest rate, and money is a residual (Meyer, 2001). Second, the short-run stickiness of prices also explains the limited effectiveness of monetary policy. In the long run prices are flexible, and hence the central bank is unable to influence the real interest rate. Therefore, monetary policy affects real variables and inflation in the short run, but is neutral in the long run. Finally, notice that combining equation (1) with equation (3) gives a negatively sloped relationships between inflation and output gap, which represent the aggregate demand function of the model (see, among others, Romer, 2000; Taylor 2000; Fontana and Setterfield, 2009).

The closure of the model (1)-(3) requires the specification of the nature of expectations, that is, of the form of the set of functions $E(\cdot)$. In this regard, NCM authors admit that expected values of inflation and output may deviate from actual values in the short run. This discrepancy, in turn, may temporarily push the economic system out of its natural equilibrium state (or natural growth path). Consequently, there is some room for public intervention in the short run, though mainly through the steering of the target interest rate, in order to anchor inflation expectations. By contrast, forecasts could not be systematically wrong over time. The rational expectations hypothesis, i.e. the assumption that agents know the right economic model and can use all information efficiently, remains the first theoretical pillar of the NCM. Exogenous non-systematic shocks may affect the equilibrium in the long run: in equations (1) to (3) this random component is 'captured' by ε_i (with $i = 1, 2, 3$). But, apart from this, every systematic economic policy is doomed to leave real magnitudes, notably output and employment rate, unchanged. For instance, the only long-run effect of a long-lasting expansive fiscal stimulus would be an increase in inflation and (both nominal and real) interest rates (Fontana, 2000b, 2009c). This result is the NCM equivalent of the well-known neoclassical principle of the long-run neutrality of demand-led macroeconomic policies (Fontana, 2011). In addition to rational expectations, the other theoretical pillar of the NCM is the notion of a natural (or long-run or trend) equilibrium, namely the state towards which a fully competitive economy would tend in the long run, when the inflation expectations of agents are utterly fulfilled. In the natural equilibrium state, output and employment levels are determined by three factors: (i) the quantity of labour-force and capital (i.e. the stock of resources); (ii) the system of preferences of individual agents (i.e. the utility function of consumers or households); and (iii) the available technology (i.e. the production function of firms).

The mechanics of the NCM model follows from the theoretical pillars discussed above. A departure of output from its natural level (or natural growth rate) causes inflation to change, which in turn leads the central bank to move the short-run nominal interest rate, and given the stickiness of price,

the short-run real interest rate, such that to bring current output back to its normal level.³ This is the so-called ‘nominal-anchor’ function of monetary policy (Allsopp and Vines, 2000, p. 11). The institutional structure of the economy, including prevailing conditions on the labour market, is sometimes considered, but the natural or potential level of output is always independent of aggregate demand changes, including fiscal and monetary policy led changes.

However, the two theoretical pillars of the NCM modern, namely the rational expectations hypothesis and the notion of a natural (or long-run or trend) equilibrium are problematic (Hargreaves-Heap, 1980). Real world economies are essentially non-ergodic and path-dependent systems (Davidson, 1978; Hanngsen, 2006). Economic variables do not progress steadily toward an exogenously-given unique and stable equilibrium. They can reach several (sub-optimal) equilibria, and each of the equilibria achieved depends on past values. On the whole, it is not clear how the natural equilibrium would be reached in the long run. The achievement of such an optimal position is simply postulated. In order to clarify this point, a simplified version of the previous 3-equation NCM model is presented below:

$$(4) \quad Y_t = \alpha_0 - \alpha_1 (r_{t-1} - \pi_{t-1}) + \varepsilon_1$$

$$(5) \quad \pi_t = \pi_{t-1} + \beta_1 (Y_{t-1} - Y_{[t-1]}^n) + \varepsilon_2$$

$$(6) \quad r_t = \pi_t + RR_t^* + \gamma_1 (\pi_{t-1} - \pi^T) + \gamma_2 [Y_t - E(Y_{[t+1]}^n)] + \varepsilon_3$$

where $\alpha_0, \alpha_1, \beta_1, \gamma_1, \gamma_2 > 0$. The main difference with the previous model is that equation (4) now determines the current value (or growth rate) of output, Y_t , instead of its gap with the natural level (or growth rate), $Y_{[t]}^n$ (where square brackets show that, in principle, natural output is independent of current conditions). In addition, for the sake of simplicity, equations (4) and (5) are assumed not to be forward-looking. The variable RR_t^* in equation (6) is the real rate of interest assuring the ex-ante matching of savings and investment at the natural level of output. It corresponds to the Wicksellian natural rate of interest (Fontana, 2007), and can be derived by substituting equation (4) in equation (6). Then, by imposing that the actual inflation rate equals the target rate, and that the output gap is nil, it follows:

$$(7) \quad RR_t^* = (\alpha_0 - Y_t^n) / \alpha_1$$

If the central bank sets the value of RR_t^* in accordance with equation (7), then the economy reaches its natural equilibrium, and the system (4)-(5)-(6)-(7) behaves like the system (1)-(2)-(3). Yet, the assumption that the level (or growth rate) of potential output is an exogenous variable has been criticized by several authors. Labour productivity (e.g. the impact of learning by doing of workers,

³ For a critical assessment of the monetary policy rules in the NCM, see Fontana and Palacio-Vera (2002), and Brancaccio and Fontana (2013). See, also Allington and McCombie (2005), for an analysis of the role of stock market prices in monetary policy rules.

technological innovations and investment in fixed capital) and the availability of labour-force (e.g. migration flows) are strictly linked to the current level of demand and output (Setterfield, 2002; León-Ledesma and Thirlwall, 2002; Lavoie, 2006; Fontana and Palacio Vera, 2007; McCombie and Pike, 2013; Sawyer, 2013). All these factors affect the future potential output of the economy. Following Lavoie (2006, p. 182), the reduced-form NCM model (4)-(5)-(6)-(7) should, therefore, be amended by introducing an additional equation:

$$(8) \quad Y_t^n = Y_{t-1}^n + \phi(Y_{t-1} - Y_{t-1}^n) + \varepsilon_4$$

where $0 < \phi \leq 1$.

Equation (8) means that the short-run level of output affects the long-run potential or natural level of output (Lavoie, 2006, p. 181; see also Flaschel, 2000; Fontana, 2010). In other words, equation (8) allows for hysteresis effects to be introduced into the benchmark NCM model, in this way allowing for the interdependence between the aggregate demand for and the aggregate supply of goods and services. For this reason, the reduced-form NCM model (4)-(5)-(6)-(7)-(8) is labelled the augmented NCM model in the rest of this chapter.

3. Adding Banks and Financial Intermediaries to the NCM Model

In the aftermath of the 2007-2008 financial crisis, several scholars argued that the NCM model is not fit for modern economies. It does not capture fundamental aspects of the working of financially-sophisticated capitalist economies, including the possibility of financial turmoil, financial and banking crises, and related prolonged recessions (e.g. Foley and Farmer, 2009; Krugman, 2009; Buiter, 2009; and Spaventa, 2009). Lucas (2009) seems to agree with this view. He maintains that the 2007-2008 financial crisis was not predicted because such events cannot be predicted by NCM model (and related DSGE models alike): simulations based on the NCM model are not an “assurance that no crisis would occur, but [...] a forecast of what could be expected conditional on a crisis not occurring” (Lucas, 2009). In this regard, one of the main theoretical issues, with significant practical consequences (see, for example, Allington et al., 2012), is that the benchmark NCM model relies on both the ‘efficient market hypothesis’ (EMH hereafter) and the ‘Modigliani-Miller theorem’ (MMT hereafter), in the medium to long run at least (Veronese Passarella, 2014). According to the EMH, prices of traded assets always reflect all available information, while the MMT maintains that, under a number of restrictive assumptions, the value of a firm is unaffected by how it is financed. As a result, given enough long time, money and finance would not affect output and employment, but only inflation and nominal interest rates. This again is not surprising: if an autonomous investment function of firms is ruled out of the model, then conditions of financing of investment (and current production) cannot, by definition, influence real variables.

The explicit analysis of the possible interaction between the real economy, and the prevailing conditions in the banking and financial sectors is the core feature of the ‘financial accelerator mechanism’ (FAM) literature, originally developed by Bernanke, Gertler and Gilchrist during the early 1980s (e.g. Bernanke, 1981, and 1983; Bernanke and Gertler, 1989; see also Bernanke et al., 1996, and 1999). The FAM literature recognises that firms need external finance in order to realise their investment projects. Furthermore, it brings to light the informational asymmetries between

lenders (i.e. banks and financial intermediaries) and borrowers (i.e. firms). On this basis, then it analyses the process by which negative shocks to the real sector of an economy are amplified by the workings of the banking and financial sectors.

The FAM literature introduces several innovative aspects into the mainstream macroeconomics debate. First, the informational asymmetries between lenders and borrowers make both the EMH and the MMT so cherished by NCM authors inapplicable. Second, these informational asymmetries mean that lenders have little information about the reliability of borrowers. Lenders face conventional agency costs, including monitoring costs and potential bankruptcy risks, which in turn translate into a premium for firms of the cost of external finance vis-à-vis internal finance. Third, in the face of informational asymmetries banks and financial intermediaries assess the ability of repaying loans by using the market value of the net worth of firms, i.e. the collateralized assets of firms.

Two important implications follow from these theoretical innovations. First, the net worth, and hence the ability to borrow of firms moves pro-cyclically (e.g. Bernanke and Gertler, 1989). An increase in asset prices and cash-flows raises the net worth of firms, and reduce the premium of external finance on internal finance. This in turn boosts investment, aggregate demand, and economic activity, which have then positive feedbacks on the net worth of firms, and so on. Similarly, a fall in assets prices triggers a vicious self-reinforcing cycle. A reduction in the net worth of firms leads banks and financial intermediaries to tighten financing conditions. This reduces the ability of firms to borrow and finance investment. Economic activity falls, which then further reduces assets prices and the net worth of firms, and so on. This is the core of the FAM. An initial shock to the economy, however small it is, is likely to be amplified by changes in the balance sheets of firms and, more generally, by conditions in the banking and financial sectors. Second, the dynamics of the FAM is intrinsically nonlinear, since it depends on both the current level of internal finance of firms, and the general conditions of the economy. For instance, the more an economy is in a deep recession, the less likely would be the availability of external and internal finance, and hence the stronger will be the autoregressive movement in demands (e.g. Bernanke and Gertler, 1989, pp. 14-15; Bernanke et al., 1996, pp. 3-4). This, in turn, will produce dramatic effects for firms. They will be accumulating excess inventories, while reducing the employment level and/or real wages bargained with workers (e.g. Greenwald and Stiglitz, 1993, p. 109).

It is worthy to note that references to an exogenously-given natural level or rate of growth of output are rare in the FAM literature. On the one hand, it is clearly stated that the methodological starting point of the FAM model is the benchmark NCM model. On the other hand, FAM scholars ignore long run financial relationships in their works (e.g. Bernanke and Gertler, 1989, p. 15). In other words, price flexibility is no longer regarded as the natural or long-run condition of the system, but just as the limiting case – as Bernanke et al. (1999, p. 6) call it. The long run is regarded as an ideal path, rather than as the historical tendency of capitalist economies. But then, if the relationship between price stickiness and price flexibility is reversed, with the latter being the exception rather than the norm, short-run sub-optimal equilibria become the rule, and so it does public intervention. This controversial interpretation of the FAM literature is supported by the repeated reference to the debt-deflation theory of Fisher (1933), and also by mention of the work of Minsky and Kalecki (e.g.

Bernanke et al., 1999; and Bernanke, 1983, which quotes Minsky, 1977). In fact, the discussion by FAM scholars of agency costs resonate the Minskian ‘objectivation’ of the lender risk into interest rates, fees and commissions that firms have to pay in order to access external financing (e.g. Minsky, 1986). In this regard, another interesting feature of FAM models is the assumed heterogeneity of agents. As Bernanke et al. (1996), explain these models “step outside the convenient representative-agent paradigm ... [since] the distribution of wealth affects the dynamics of the economy in a nontrivial way” (pp. 3-4).

According to FAM scholars, during economic recessions the reallocation of bank lending from firms whose net worth is decreasing to more solvent firms trigger a ‘flight-to-quality’ (or ‘flight-to-safety’) process. This, in turn, increases the financial fragility of a country. Against this background, it is argued that large corporations are likely to be less hit by the greater cost (or difficulty) in obtaining credit in downturns compared to small firms. FAM scholars then conclude that “recessions that follow a tightening of monetary policy are perhaps most likely to involve a flight to quality, because of the adverse effect of increased interest rates on balance sheets and because of monetary tightening may reduce flows of credit through the banking system” (Bernanke et al., 1996, p. 6; see also Bernanke and Blinder, 1988). To put it differently, FAM scholars seem to argue that monetary policy affects output and other real magnitudes not so much because prices are sticky, as it is assumed in the benchmark NCM model, but rather because it affects the price and access to external finance, which has a crucial impact on the investment and production plans of firms.

As far as the formal modelling is concerned, the benchmark FAM model is usually obtained through a process of microeconomics foundation of the macroeconomic dynamics. This is done by considering a production (or investment) technology that involves asymmetric information between firms, who have direct access to the technology, and banks and financial intermediaries, who have not. In addition, it is assumed that banks and financial intermediaries incur agency costs in order to observe the investment returns of firms. These costs are in turn assumed to be a decreasing function of the soundness of the balance-sheet of borrowers, i.e. the net wealth of firms. Finally, since the latter is likely to move pro-cyclically, agency costs will behave counter-cyclically, therefore improving lending conditions in booms and deteriorating them in recessions. In this way, the accelerator (macroeconomic) effect of income on investment is brought back to a simple (microeconomic) principal-agent problem (Bernanke et al., 1996, p. 27).

The simplest way to include the FAM mechanism within the benchmark NCM model discussed in the previous section is to replace equation (1) with the following:

$$(9) \quad Y_t^g = a_0 + a_1 Y_{t-1}^g + a_2 E(Y_{t+1}^g) - a_3 [r_t - E(\pi_{t+1})] + a_4 H_{t-1} + \varepsilon_1$$

with:

$$(10) \quad H_t = H_{t-1} + \omega Y_t^g + \varepsilon_4$$

where H_t is the net worth of investing firms, $0 < \omega < 1$ is the share of aggregate (retained) profits

and capital gains in total output (gap), and $\alpha_4 > 0$ is the sensitivity of total output gap to changes in the credit-worthiness of firms, through changes in the finance available for investment. The basic idea underpinning equations (9) and (10) is that investment, and hence current output, are crucially affected by the financial soundness of the consolidated balance-sheet of firms. More precisely, the lower (higher) the amount of internal funds accumulated by firms over the previous periods, the lower (higher) will be current investment and output. It is worthy to note that changes in internal funds can affect production decisions both through the self-financing of investment (direct channel), and through the degree of credit-worthiness of firms used by banks and financial intermediaries (indirect channel). Whatever the prevalent channel, the result is a strengthening and extension of the short-run effects of aggregate demand on output and employment levels.

Table 1. Four different mainstream macroeconomics models

	Without finance	With finance (accelerator)
Temporary effect of demand	(I) Benchmark NCM	(III) Benchmark FAM
Permanent effect of demand (hysteresis)	(II) Augmented NCM	(IV) Augmented FAM

Source: Own Construction

Table 1 presents the four different mainstream macroeconomics models discussed in this chapter, notably the benchmark NCM model (I), the augmented NCM model (II), the benchmark FAM model (III), and the augmented FAM model (IV). Models (I)-(III) have been examined above, while model (IV) is a modified version of model (II). It takes into account the cumulative effects on investment of changes in the market-value of the net worth of firms, as it occurs in model (III). Yet, unlikely model (III), model (IV) does not involve any exogenously-given natural level of output towards which the economy is assumed to move. In algebraic terms, it is derived by replacing equation (4) of model (II) with Equation (11) below:

$$(11) \quad Y_t = \alpha_0 - \alpha_1 (r_{t-1} - \pi_{t-1}) + \alpha_2 H_{t-1} + \varepsilon_1$$

where $\alpha_2 > 0$, while Equation (10) can be rewritten as:

$$(12) \quad H_t = H_{t-1} + \omega (Y_t - Y_t^n) + \varepsilon_4$$

Consequently, the interest rate rule defined by Equation (7) must be replaced by Equation (13) below:

$$(13) \quad RR_t^* = (\alpha_0 - Y_t^n + \alpha_2 H_{t-2}) / \alpha_1$$

The model determined by the system of equations (11)-(5)-(6)-(13)-(8)-(12) is a synthesis of models (II) and (III): like in model (III) changing conditions in the banking and financial sectors amplify

real shocks, and can trigger booms and recessions. In addition, like in model (II), long-run levels of output and employment are affected via hysteresis effects by the current level of demand. This second feature is what distinguishes it from the benchmark FAM model.

Interestingly, FAM scholars acknowledge that the financial accelerator introduces a long-lasting (though not ever-lasting) hysteresis effect of aggregate demand into the benchmark NCM model. In the absence of information asymmetries – it is argued – investment demand can be safely assumed to be fixed over time, in the first approximation at least. By contrast, “when information asymmetries are present, investment demand will vary and be history-dependent” (Bernanke and Gertler, 1989, p. 20). This effect has important policy implications, namely that one of main goals of central banks should be to strengthen the balance-sheets of economic agents, through the stabilization of financial asset (viz. collateral) markets. This policy implication of the FAM is explored in great details in the next Section.

4. The Current State of Macroeconomics

The repeatedly wrong predictions, and especially the failure in providing a satisfactory explanation of the 2007-2008 US crisis and the subsequent global financial crisis and economic recession, has represented a serious blow for the reputation of the NCM. There have been two main reactions to this in the economics discipline. Some scholars have argued that the proclaimed consensus around the benchmark NCM model was short-lived and finally unsuccessful (e.g. Buiter, 2009). Other scholars have accepted the shortcomings of their original macroeconomics analyses, and tried to amend the NCM model. As argued by McCombie and Pike (2013) the analytical core of the NCM model is in fact still “seen by many to be relatively unscathed (but with the imperative to build in assumptions that allow for debt default and bankruptcy)” (p. 521). To be fair, attempts to make the benchmark NCM model more realistic were made before the onset of the 2007-2008 financial crisis. The most popular way was to modify the benchmark NCM model to allow for the possibility that a fraction of households or consumers cannot access financial markets. As these non-Ricardian consumers cannot borrow or save to smooth consumption, they follow a simple ‘rule of thumb’, namely they always spend all current labour income on current consumption. Galí et al. (2004) showed that “if the weight of such rule-of-thumb consumers is large enough, a Taylor-type rule must imply a (permanent) change in the nominal interest rate in response to a (permanent) change in inflation that is significantly above unity, in order to guarantee the uniqueness of equilibrium. Hence, the Taylor principle becomes too weak a criterion for stability when the share of rule-of-thumb consumers is large” (p. 740). Furthermore, the presence of non-Ricardian consumers is proved to affect significantly the reaction of an economy to fiscal policy shocks. For instance, an increase (decrease) in government spending entails now a remarkable increase (decrease) in output, in the short to medium run at least. This conclusion has been further strengthened by recent work indicating that the actual size of the multiplier of government spending is larger than one, either when the zero-lower bound on the nominal interest rate binds or the nominal interest rate is constant (e.g. Christiano et al., 2009).

In the aftermath of the financial crisis, attempts to improve or update the benchmark NCM model have multiplied. There have been two main targets of the original benchmark NCM model. First, scholars have focused their efforts on systematic errors in inflation forecasting. Second, and related

to the previous point, scholars have tried to model financial markets and financial frictions. Starting with the former, the overestimation of deflationary effects of the financial crisis in the benchmark NCM model has been usually regarded as the consequence of the underestimation of price stickiness, which is captured by the so-called ‘Calvo parameter’ in the accelerationist Phillips curve, namely Equation (2) above. The underestimation of the degree of price rigidity has, in turn, been explained by the lack of financial frictions in the benchmark NCM model. Once these frictions are introduced, it is argued that the NCM model accurately predicts the behaviour of the US economy since 2008, including the weak drop in inflation rate. Intuitively, the rationale is that financial frictions make the Phillips curve ‘flatter’, i.e. they reduce the parameter b_1 in Equation (2), or the parameter β_1 in Equation (5), presented above. The US crisis could therefore be interpreted and modelled as the result of aggregate demand shocks in the presence of a flat aggregate supply curve (e.g. Del Negro et al., 2014, p. 19-21).

As far as the explicit modelling of financial markets and financial frictions is concerned, some NCM scholars have explored the effects of volatile risk premia, by assuming that fluctuations in these premia are the most important shocks driving the business cycle. This insight closely follows the work of Bernanke and Gertler (1989) and Bernanke et al. (1999). It represents an attempt of developing the benchmark FAM model, where the major difference between old and new models is mainly the accuracy of theoretical modelling and econometric techniques. In this regard, a fundamental contribution has been provided by Christiano et al. (2013), who assume that firms combine internal funds with external funds, namely bank loans, to acquire raw (physical) capital, and that the interest rate on loans includes a ‘premium’ covering the costs of default of firms. The production of goods and services is then likened to a process in which firms convert raw capital into effective capital under ‘idiosyncratic uncertainty’ or ‘risk’. Christiano et al. (2013) show that increases in risk premia raise the premium charged by banks, and reduce the supply of loans. In this way, they argue that increases in risk premia could account for some key features of the 2007-2008 financial crisis and related economic recession:

“With fewer financial resources, entrepreneurs acquire less physical capital. Because investment is a key input in the production of capital, it follows that investment falls. With this decline in the purchase of goods, output, consumption and employment fall. For the reasons stressed in [Bernanke et al. 1999], the net worth of entrepreneurs – an object that we identify with the stock market – falls too. This occurs because the rental income of entrepreneurs falls with the decline in economic activity and because they suffer capital losses as the price of capital drops. Finally, the overall decline in economic activity results in a decline in the marginal cost of production and thus a decline in inflation. So, according to the model the risk shock implies a countercyclical credit spread and procyclical investment, consumption, employment, inflation, stock market and credit. These implications of the model correspond well to the analogous features of US business cycle data” (Christiano et al. 2013, p. 2).

In short, fluctuations in risk premia over the risk-free interest rate should be regarded as the main trigger (or amplifier) of the business cycle. Once this mechanism is introduced in the benchmark NCM model, this is shown to accurately reproduce US cyclical fluctuations since the mid-1970s (see, also, Gilchrist et al., 2009; Merola, 2013). These results echo early work by Borio et al. (2001)

and Borio (2006), which explored the effects of changes in the absolute level of financial risks over time. Borio and his colleagues show that, when incentives and potential mismeasurements by financial market participants are allowed, the underestimation of risks in booms and the overestimation in recessions become a realistic possibility. This has deleterious effects on bank provisions and capital ratios. In turn, this strengthens the pro-cyclicality of bank profits, thereby encouraging banks to increase lending in booms and to reduce it in recessions. Alternative recent ways of modelling of financial markets and financial frictions include the introduction of collateral constraints, currency risk premia in open economies, and Minsky-Fisher type of mechanisms (see, for useful surveys, Brunnermeier et al., 2012; Roger and Vlcek, 2012). Other models have been obtained through the explicit inclusion of a heterogeneous, monopolistically competitive banking sector (e.g. Hafstead and Smith, 2012). In summary, all recent attempts to improve or update the benchmark NCM model have tried in a way or another to model financial markets and financial frictions, and in this way they represent varieties of model (IV) presented in Table 1, namely augmented FAM models.

The different augmented FAM models discussed above represent recent attempts by mainstream macroeconomists to improve or update the benchmark NCM model. For all interesting properties, these models share two problems, namely a theoretical weakness and a policy inconsistent problem that seem to hinder further progress in mainstream macroeconomics theory and policy-making. Starting with the former, augmented FAM models assume that financial instability and long-lasting slumps are the result of exogenous market frictions, i.e. imperfections, asymmetries or rigidities in the banking and financial sectors. They never allow for the possibility that financial instability is the endogenous by-product of the normal functioning of modern economies. In other words, augmented FAM models still assume like in the old benchmark NCM model that in the long run free market forces would drive the economy towards a unique exogenously-given and socially-optimal equilibrium. It was this hypothesis of a natural equilibrium, coupled with the REH, which had left early NCM scholars with no other choice but the adoption of ad-hoc assumptions about the stickiness of prices to fit real-world data. As explained by De Grauwe (2010), “[w]hy is it that in a world where everybody understands the model and each other’s rationality, agents would not want to go immediately to the optimal plan using the optimal price? [...] Calvo pricing is an ad hoc assumption forced unto the model to create enough inertia so that it would fit the data better” (pp. 416-17). A similar consideration could be made against modern macroeconomists attempting to update the benchmark NCM model by modelling conditions in the banking and financial sectors, including the possibility of financial instability, via ad-hoc assumptions about exogenous market frictions. This critical stance has in fact led some behavioural economists to explore the effects of different heuristics on the financial behaviour of agents (e.g. De Grauwe, 2010), while other economists are experimenting with alternative macroeconomic modelling, including the ‘stock-flow consistent’ approach of Godley and Lavoie (2007; see also among others, Dos Santos, 2006; van Treeck 2009; Caverzasi and Godin, 2015; Greenwood-Nimmo, 2014; Sawyer and Veronese Passarella, 2017; Nikiforos and Zezza, 2017).

Notwithstanding the theoretical weakness of old and new FAM models discussed above, these latter models lead to a different rule of central banking vis-à-vis the benchmark NCM model. This is the policy inconstant problem. Although seldom pointed out, this policy implication of FAM models

should not be underestimated. The point is that once it is admitted that lending is driven by the creditworthiness of borrowers, and thereby by the soundness of their balance-sheets, it turns out that the stabilization of the market value of financial assets, especially those used as collaterals by firms, should be the priority of the central bank. The policy implication of FAM models would also highlight another real-world feature of the last couple of decades, namely that the vast majority of refinancing operations in the inter-banking market are conducted through REPOs, with government bonds acting as collaterals. But, if this is the case, then the support of government bonds, and not price stability, should be regarded as the overriding concern of central banks, at least during periods of recessions and economic stagnation. Notice that replacing risky private assets with low-risk government bonds guaranteed by central banks would further strengthen the soundness of the balance-sheets of firms, thereby contributing to smooth the business cycle. This is the ‘portfolio effect’ pointed out by Minsky (1986), and recently rediscovered by Eggertsson and Krugman (2012, p. 1471).

In short, as a result of the 2007-2008 financial and the failure of the NCM benchmark model to explain it, let alone to predict it, many attempts have been made to amend mainstream macroeconomics. The introduction of volatile risk premia, collateral constraints, currency risk premia in open economies, and Minsky-Fisher type of mechanisms are the most innovative financial frictions used to improve the long-established NCM model. A several limitation of these models is that they never allow for the possibility that financial instability is the endogenous by-product of the normal functioning of modern economies. Notwithstanding this limitation, the introduction of financial frictions in the NCM model highlight the valuable role that central banks could play in stabilising the market value of financial assets, especially those used as collaterals by firms.

5. Summary and Conclusions

Early in the 1990s a convergence of view emerged in mainstream macroeconomics. The NCM model quickly spread among academics and policy makers alike. The 2007-2008 financial crisis, resulting recession, and the current stagnation period, have highlighted a problematic feature of the model. Banks and financial intermediaries, which have played a vital role in the start and unfolding of these dramatic real-world events, are not mentioned, let alone modelled in the NCM. During the last decade, several attempts have been made to improve and update the NCM model by adding to it a role for banks and financial intermediaries. This chapter has offered a preliminary and critical assessment of these efforts.

The chapter has started with a discussion of the set of three equations describing the benchmark NCM model in a closed economy, and has highlighted the role that the REH and the notion of ‘natural equilibrium’ play into it. It has also discussed an amended version of the model, the augmented NCM model, which allows for the possibility of interdependence between aggregate demand and aggregate supply, such that it could capture some prominent features of real-world economies. The chapter has also reviewed the original contributions to the FAM made by Bernanke and his colleagues in the early 1980s. These contributions have recently been rediscovered by scholars aiming to assign a greater role to banks and financial intermediaries in mainstream macroeconomics. The original benchmark FAM model together with the recent augmented FAM

model have been discussed at great length in order to highlight the nature and role of financial instability in these models. The main conclusion of the chapter is that for all good intentions there are two still main problems that seems to hinder progress in mainstream macroeconomics theory and policy-making. First, the policy implications of the recent theoretical innovations have not been fully explored. The augmented FAM suggests replacing price stability with financial stability as the main goal of central banks. Second, and more importantly, in the most recent mainstream macroeconomics models, financial instability is still modelled as the outcome of exogenous market frictions, rather than the endogenous by-product of the normal functioning of modern economies.

References

- Allsopp, C. and Vines, D. (2000), "The assessment: macroeconomic policy", *Oxford Review of Economic Policy*, 16(4), pp. 1-32.
- Allington, N., McCombie, J.S.L. and Pike, M. (2012), "Lessons not learned: from the collapse of Long-Term Capital Management to the subprime crisis", *Journal of Post Keynesian Economics*, 34(4), pp. 555-582.
- Allington, N. and McCombie J.S.L. (2005), "Stock market prices and the conduct of monetary policy under the New Consensus monetary policy", in P. Arestis, M.C. Baddeley and J.S.L. McCombie (eds.), *The New Monetary Policy. Implications and Relevance*, Cheltenham: Edward Elgar.
- Arestis, P. (2007), "What is the New Consensus in Macroeconomics?", in P. Arestis (ed.), *Is There a New Consensus in Macroeconomics?* Houndmills, Basingstoke: Palgrave Macmillan.
- Arestis, P. (2009), "New Consensus Macroeconomics: A critical appraisal", in G. Fontana and Setterfield, M. (eds), *Macroeconomic Theory and Macroeconomic Pedagogy*, Basingstoke: Palgrave Macmillan;
- Arestis, P. and Sawyer, M. (2004), "Can monetary policy affect the real economy?" *European Review of Economics and Finance*, 3(3), pp. 9-32.
- Arestis, P. and Sawyer, M. (2006), "The nature and role of monetary policy when money is endogenous", *Cambridge Journal of Economics*, 30(6), pp. 847-860.
- Arestis, P. and Sawyer, M. (2008), "A critical reconsideration of the foundations of monetary policy in the New Consensus Macroeconomics framework", *Cambridge Journal of Economics*, 32(5), pp. 761-779.
- Arestis, P. and Sawyer, M. (2013), *Economic and Monetary Union Macroeconomic Policies, Current Practices and Alternatives*, Houndmills, Basingstoke: Palgrave Macmillan.
- Bernanke, B.S. (1981), "Bankruptcy, liquidity and recession", *American Economic Review Proceedings*, 71(2), pp. 155-159.
- Bernanke, B.S. (1983), "Nonmonetary effects of the financial crisis in the propagation of the great depression", *American Economic Review*, 73(3), pp. 257-276.
- Bernanke, B.S. and Blinder, A.S. (1988), "Credit, money, and aggregate demand", *American Economic Review, Papers and Proceedings of the One-Hundredth Annual Meeting of AEA*, 78(2), pp. 435-439.
- Bernanke, B.S. and Gertler, M. (1989), "Agency costs, net worth and business fluctuations", *American Economic Review*, 79(1), pp. 14-31.
- Bernanke, B.S., Gertler, M. and Gilchrist, S. (1996), "The financial accelerator and flight to

- quality”, *Review of Economics and Statistics*, 78(1), pp. 1-15.
- Bernanke, B.S., Gertler, M. and Gilchrist, S. (1999), “The financial accelerator in a quantitative business cycle framework”, in J.B. Taylor and M. Woodford (eds.), *Handbook of Macroeconomics*, Vol. 1, Amsterdam: Elsevier.
- Borio, C. (2006), “Monetary and prudential policies at a crossroads? New challenges in the new century”, *BIS Working Papers*, No. 216, September.
- Borio, C., Furfine, C. and Lowe, P. (2001), “Procyclicality of the financial system and financial stability: issues and policy options”, *BIS Working Papers*, No. 1, March.
- Brancaccio, E. and Fontana, G. (2013), “Solvency rule versus Taylor rule. An alternative interpretation of the relation between monetary policy and the economic crisis”, *Cambridge Journal of Economics*, 37(1), pp. 17-33.
- Brunnermeier, M.K., Eisenbach, T.M and Sannikov, Y. (2012), “Macroeconomics with financial frictions: a survey”, *NBER Working Paper Series*, No. 18102.
- Buiter, W. (2009), “The unfortunate uselessness of most ‘state of the art’ academic monetary economics”, *Financial Times*, 3 March.
- Calvo, G. (1983), “Staggered prices in a utility-maximizing framework”, *Journal of Monetary Economics*, 12(3), pp. 383-398.
- Caverzasi, E. and Godin A. (2015), “Post-Keynesian Stock-Flow-Consistent modelling: A survey”, *Cambridge Journal of Economics*, 39(1), pp. 157-187.
- Clarida, R., Galì, J. and Gertler, M. (1999), “The science of monetary policy: a New Keynesian perspective”, *Journal of Economic Literature*, 37(4), pp. 1661-1707.
- Christiano, L., Eichenbaum, M. and Rebelo, S. (2009), “When is the government spending multiplier large?”, *NBER Working Paper Series*, No. 15394.
- Christiano, L., Motto, R. and Rostagno, M. (2013), “Risk shocks”, *NBER Working Paper Series*, No. 18682.
- Davidson, P. (1978), *Money and the Real World*, London: Macmillan
- Del Negro, M., Giannoni, M.P., and Schorfheide, F. (2014), “Inflation in the Great Recession and New Keynesian models”, *Federal Reserve Bank of New York: Staff Reports*, No. 618 (May 2013; revised January 2014).
- Eggertsson, G.B. and Krugman, P. (2012), “Debt, deleveraging, and the liquidity trap”, *Quarterly Journal of Economics*, 127(3), pp. 1469-1513.
- De Grauwe, P. (2010), “The scientific foundation of dynamic stochastic general equilibrium (DSGE) models”, *Public Choice*, 144(3-4), pp. 413-443.
- Dixon, H.D. (2008), “New Keynesian macroeconomics”, in S.N. Durlauf and L.E. Blume (eds.), *The New Palgrave Dictionary of Economics*, Second Edition, Basingstoke and New York: Palgrave Macmillan.
- Dos Santos, C.H. (2006), “Keynesian theorising during hard times: Stock-Flow Consistent models as an unexplored ‘frontier’ of Keynesian macroeconomics”, *Cambridge Journal of Economics*, 30(4), pp. 541-565.
- Dullien, S. (2009), “The New Consensus from a traditional Keynesian and Post-Keynesian perspective”, *IMK Working Paper*, No. 12-2009, Hans Boeckler Foundation, Macroeconomic Policy Institute.
- Fisher, I. (1933), “The debt-deflationary theory of great depressions”, *Econometrica*, 1(4), pp. 333-357.

- Flaschel, P. (2000), “Keynes-Marx and Keynes-Wicksell models of monetary growth: a framework for future analysis”, *Review of Political Economy*, 12(4), pp. 453–68.
- Foley, D. and Farmer, J.D. (2009), “The economy needs agent-based modelling”, *Nature*, 460, pp. 685-686.
- Fontana, G. (2007), “Why money matters: Wicksell, Keynes, and the new consensus view on monetary policy”, *Journal of Post Keynesian Economics*, 30(1), pp. 43-60.
- Fontana, G. (2009a), *Money, Uncertainty and Time*, London: Routledge.
- Fontana, G. (2009b), “Whither New Consensus Macroeconomics? The Role of Government and Fiscal Policy in Modern Macroeconomics”, in E. Hein, T. Niechoj and E. Stockhammer (eds.), *Macroeconomic Policies on Shaky Foundations - Whither Mainstream Economics?*, Marburg, Metropolis Verlag, pp. 187-208. Republished in L.R. Wray (2013) (ed.), *Theories of Money and Banking*, The International Library of Critical Writings in Economics series, Cheltenham, UK: Edward Elgar.
- Fontana, G. (2009c), “The transmission mechanism of fiscal policy: A critical assessment of current theories and empirical methodologies”, *Journal of Post Keynesian Economics*, 31(4), pp. 587-604.
- Fontana, G. (2010), “The return of Keynesian economics: A contribution in the spirit of John Cornwall’s work”, *Review of Political Economy*, 22(4), pp. 517-533.
- Fontana, G. and Palacio-Vera, A. (2002) ‘Monetary policy rules: what are we learning?’, *Journal of Post Keynesian Economics*, 24(4): 547–68.
- Fontana, G. and Palacio-Vera, A. (2007), “Short-run output stabilisation all that monetary policy can aim for?”, *Metroeconomica*, 58(2), pp. 269-298.
- Fontana, G. and Setterfield, M. (2009), “Macroeconomics, endogenous money and the contemporary financial crisis: A teaching model”, *International Journal of Pluralism and Economic Education*, 1(1), pp. 130-147.
- Fontana, G. and Setterfield, M. (eds.) (2010), *Macroeconomic Theory and Macroeconomic Pedagogy*, Basingstoke: Palgrave Macmillan.
- Gali, J., López-Salido, J.D. and Vallés, J. (2004), Rule-of-thumb consumers and the design of interest rate rules”, *Journal of Money, Credit, and Banking*, 36(4), pp. 739-763.
- Gilchrist, S., Ortiz, A. and Zakrajšek, E. (2009), “Credit risk and the macroeconomy: evidence from an estimated DSGE model”, Paper prepared for the FRB/JMCB conference ‘Financial Markets and Monetary Policy’, held at the Federal Reserve Board, Washington D.C., 4-5 June.
- Godley, W. and Lavoie, M. (2007), *Monetary Economics: An Integrated Approach to Credit, Money, Income Production and Wealth*, Basingstoke: Palgrave Macmillan.
- Goodhart, C.A.E (2010), “Money, credit and bank behaviour: Need for a new approach”, *National Institute Economic Review*, 214, F73-F82.
- Goodfriend, M. (2004), “Monetary policy in the New Neoclassical Synthesis: a primer”, *Economic Quarterly*, 90(3), pp. 21-45.
- Goodfriend, M. and King, R. (1997), “The New Neoclassical Synthesis and the role of monetary policy”, in B.S. Bernanke and J. Rotemberg (eds.), *NBER Macroeconomics Annual 1997*, Vol. 12, Cambridge (Massachusetts): MIT Press.
- Greenwood-Nimmo, M. (2014), “Inflation targeting monetary and fiscal policies in a two-country stock-flow-consistent model”, *Cambridge Journal of Economics*, 38(4), pp. 839-867.
- Greenwald, B.C. and Stiglitz, J.E. (1993), “Financial market imperfections and business cycles”,

- Quarterly Journal of Economics, 108(1), pp. 77-114.
- Hafstead, M. and Smith, J. (2012), "Financial shocks, bank intermediation, and monetary policy in a DSGE Model". Available at: http://www.rff.org/Documents/HafsteadSmith_September2012.pdf
- Hanngsen, G. (2006), "The transmission mechanism of monetary policy: a critical review", in P. Arestis P. and M. Sawyer (eds.), *A Handbook of Alternative Monetary Economics*, Cheltenham and Northampton: Edward Elgar.
- Hargreaves-Heap, S.P. (1980), "Choosing the wrong natural rate: accelerating inflation or decelerating employment and growth", *Economic Journal*, 90(1), pp. 611-620.
- Krugman, P. (2000), "There's something about macro", Massachusetts Institute of Technology website: <http://web.mit.edu/krugman/www/ism.html>
- Lavoie, M. (2006), "A Post-Keynesian amendment to the New Consensus on monetary policy", *Metroeconomica*, 57(2), pp. 165-192.
- León-Ledesma, M.A. and Thirlwall, A.P. (2002), "The endogeneity of the natural rate of growth", *Cambridge Journal of Economics*, 26(4), pp. 441-459.
- Lucas, R. (2009), "In defence of the dismal science", *The Economist*, 6th August.
- McCombie, J.S.L. and Pike, M. (2013), "No end to the consensus in macroeconomic theory? A methodological inquiry", *American Journal of Economics and Sociology*, 72(2), pp. 497-528.
- McCombie, J.S.L. and Negru, I. (2014), "On economic paradigms, rhetoric and the micro-foundations of macroeconomics", *European Journal of Economics and Economic Policies: Intervention*, 11(1), pp. 53-66.
- Merola, S. (2013), "The role of financial frictions during the crisis: and estimated DSGE model", National Bank of Belgium: Working Paper Research, No. 249.
- Meyer, L.H. (2001), "Does money matter?", *Federal Reserve Bank of St. Louis Review*, 83(5), pp. 1-15.
- Minsky, H.P. (1977), "A theory of systematic fragility", in E.I. Altman and A.W. Sametz (eds.), *Financial Crises*, New York: Wiley-Interscience.
- Minsky, H.P. (1986), *Stabilizing an Unstable Economy*, New Haven: Yale University Press.
- Nikiforos, M. and Zezza, G. (2017), "Stock-Flow Consistent macroeconomic models: A survey", Levy Economics Institute of Bard College Working Paper, No. 891. Forthcoming in the *Journal of Economic Surveys*.
- Palacio-Vera, A. (2009), "Money wage rigidity, monopoly power and hysteresis", in P. Arestis and M. Sawyer (eds.), *Path Dependency and Macroeconomics*, London: Palgrave Macmillan.
- Roger, S. and Vlcek, J. (2012), "Macrofinancial modelling at central banks: recent developments and future directions", *IMF Working Papers*, No. 21.
- Romer, D. (2000), "Keynesian macroeconomics without the LM curve", *Journal of Economic Perspectives*, 14(2), pp. 149-169.
- Sawyer, M. (2013), "Endogenous money, circuits and financialisation", *Review of Keynesian Economics*, 1(2), pp. 230-241.
- Sawyer, M. and Veronese Passarella, M. (2017), "The monetary circuit in the age of financialisation: A Stock- Flow Consistent model with A twofold banking sector", *Metroeconomica*, 68(2), pp. 321-353.
- Setterfield, M. (2002), "Introduction: a dissenter's view of the development of growth theory and the importance of demand-led growth", in M. Setterfield (ed.), *The Economics of Demand-led Growth: Challenging the Supply-side Vision of the Long Run*, Cheltenham: Edward Elgar.

- Setterfield, M. (2010), *Handbook of Alternative Theories of Economic Growth*, Cheltenham: Edward Elgar.
- Smets, F. and Wouters, R. (2003), “An estimated dynamic stochastic general equilibrium model of the Euro Area”, *Journal of the European Economic Association*, 1(5), pp. 1123-1175.
- Smets, F. and Wouters, R. (2007), “Shocks and frictions in US business cycles. A Bayesian DSGE approach”, European Central Bank, Working Paper Series, No. 722, February.
- Spaventa, L. (2009), “Economists and economics: What does the crisis tell us?”, *Real-World Economics Review*, 50 (September), pp. 132-142.
- Taylor, J.B. (1993), “Discretion versus Policy Rules in practice”, *Carnegie-Rochester Conference Series on Public Policy*, 39(1), pp. 195-214.
- Taylor, J.B. (1999), *Monetary Policy Rules*, Chicago: University of Chicago Press.
- Taylor, J.B. (2000), “Teaching modern macroeconomics at the principles level”, *American Economic Review*, 90(2), pp. 90–94.
- Tovar, C.E. (2009), “DSGE models and central banks”, *Economics: open access/open assessment e-journal*, 3, pp. 1-30, Available at: <http://www.economics-ejournal.org>
- Van Treeck, T. (2009), “A synthetic, Stock-Flow Consistent macroeconomic model of financialisation”, *Cambridge Journal of Economics*, 33(3), pp. 467-493.
- Veronese Passarella, M. (2014), “Financialization and the monetary circuit: a macro-accounting approach”, *Review of Political Economy*, 26(1), pp. 107-127.
- Woodford, M. (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton: Princeton University Press.
- Woodford, M. (2009), “Convergence in macroeconomics: Elements of the New Synthesis”, *American Journal of Economics: Macroeconomics*, 1(1), pp. 267-79 (PDF file downloadable from: http://www.columbia.edu/~mw2230/Convergence_AEJ.pdf, April 30th 2013).