Demand, Money and Finance in the New Consensus Macroeconomics. A Critical Appraisal

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Abstract

In the last two decades, a convergence of views in macroeconomics has seemed to emerge. The reason is that there would be no longer any fundamental disagreement among (mainstream) macroeconomists about aims and methodology of economics. Such a pervasive 'new consensus' would concern both economic-modelling and policy-making (particularly central-banking). On the theoretical side, in the new consensus, as in the old one, an expansionary fiscal policy does not improve real magnitudes in the long run, while it leads to higher inflation rates and higher interest rates. The two old-fashioned neoclassical-monetarist principles of the 'ineffectiveness of fiscal policy' and the 'neutrality of money' are still accepted. However, theorists and practitioners of the new consensus' view reject the quantitative theory of money in favour of an endogenous theory of money. In the wake of the Wicksellian 'two-interest-rate model' they focus on the central bank's targeting of the interest rate, whereas monetary aggregates are treated as residual (endogenous) variables. In spite of this remarkable theoretical innovation, banks and financial institutions are usually neglected. So the two questions of the origin of financialization and of why today's economies are prone to financial instability and recurrent crises, remain unsolved. This should sound rather odd if one considers that the new consensus model is adopted by the most part of central banks around the world. Against this background, the aim of the paper is two-fold: first, to provide a critical analysis of both the basic new consensus macroeconomics' model and some further 'heretical' developments of it; second, to show that few amendments to the basic framework, aiming to model both the hysteresis of output and the role of finance and credit markets, are sufficient to make the model account for the tendency of capitalist economies to reach (and temporarily stabilize at) different equilibria.

Keywords: New Consensus Model, Hysteresis of Output, Endogenous Money, Financial Accelerator.

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1 Introduction

In the last two decades, a convergence of views in dominant macroeconomics has seemed to emerge. The reason is that there would be no longer such fundamental methodological disagreements among mainstream macroeconomists "about what kind of questions one might reasonably seek to answer or what kinds of theoretical analyses or empirical studies should even be admitted as contributions to knowledge" (Woodford 2009[58], p. 2). Such a 'new consensus' in macroeconomics (NCM hereafter) does not solely concern the academic economic modelling. On the contrary, it is "pervasive in policy-research projects at universities and central banks around the world' (Taylor 2000[51], p. 90). On the *methodological* side, the NCM claims to be a new synthesis incorporating "important elements of each of the apparently irreconcilable traditions of macroeconomic thought" (Woodford 2009[58], p. 3), notably, the Neo Keynesian one and the Monetarist one.[1] More precisely, there are five formerly con-

[1]Arguably, this is the reason why some authors – such as Goodfriend and King (1997[28]), Dixon (2008[18]), and McCombie and Pike (2013[37]) – call it 'the New Neoclassical Synthesis'. Notice, in this regard, that under the label 'Neo Keynesians' we include just the authors of the early IS-LM model (or the old 'Neoclassical Synthesis'). By contrast, under the label 'Monetarist' we will include not only the early Friedman's critical amendment of

troversial issues about which there would be now agreement among mainstream economists and which are embedded in the NCM: 1. macroeconomic analysis should be micro-founded, that is, macroeconomic models should be explicitly based on inter-temporal general-equilibrium foundations (or 'first principles');[2] 2. quantitative policy analysis should be based on econometrically-validated structural models; 3. when evaluating the effects of alternative policy measures, the impact of these on agents' expectations should be explicitly considered (to account for the well-known Lucas' critique); 4. the main source of business fluctuations are real disturbances, rather than monetary shocks; 5. monetary policy is effective. Similarly, five are the key *analytical* components of the NCM, notably:

> 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 longrun 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 shortrun 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[51], p. 90)

As we will thoroughly argue in section 4, the emerging consensus concerns also the specific way in which the macroeconomic policy should be conducted. Yet, a careful analysis of the basic model shows that the NCM maintains some bonds with the Monetarist approach and, especially, with its later theoretical spin-offs. Within the NCM, as in the old mainstream, "expansionary fiscal policy leads to higher inflation rates and higher real interest rates in the long run, while it has no impact on real activity" (Lavoie 2006[33], p. 166). The old-fashioned neoclassical principle of the 'neutrality of money' is, therefore, still confirmed in the long run. The main novelty compared to the early neoclassical-monetarist approach is the rejection of the exogenous theory of money supply in favour of a somewhat endogenous theory of money focused

the Neo Keynesian IS-LM model, but also the Rational Expectations school, the New Classical Macroeconomics and the Real Business Cycle school. On the theoretical roots of the NCM we also refer the reader to note 20.

[2]Actually, macroeconomic analysis has always incorporated microeconomic 'foundations'. The issues are rather: (i) what those foundations are (the NCM authors insist on a utility maximising foundation, coupled with an individual-based approach in which firms are merely representatives of their owners, households, maximising profits on their behalf); (ii) what, if any, are the macroeconomic aspects (in the sense of Pasinetti of relationships which hold at the aggregate level to which there is not an individual counterpart). For example, the so-called 'NAIRU' is an aggregate rate of unemployment.

on the central bank's targeting of the (real) interest rate.[3] However, as in the past, "the money market and financial institutions are typically not mentioned, let alone modelled" (Arestis 2009[3], p. 11). So the two questions of the origin of financialization and of why today's economies are prone to financial instability and recurrent crises remain unsolved. This should sound rather odd if one considers that this is the model adopted by the most part of central banks around the world. Actually, some attempts to include the impact of financial relationships on real magnitudes have been provided since the early 1980s. We refer, particularly, to the literature on the 'financial accelerator' mechanism (see, mainly, Bernanke 1981[8], 1983[8]; Bernanke and Gertler 1989[11]; Bernanke *et al.* 1996[12], 1999[13]). However, the basic NCM essentially relies on the same non-monetary (though 'imperfectionist' and 'frictionist') dynamic stochastic general equilibrium (DSGE)'s techniques of modelling which have been pioneered by the real business cycle (RBC) approach (see Clarida *et al.* 1999[16]).[4]

Against this background, the paper is organized as follows. Sections 2 and 3 provide an outline of the analytical core of the NCM model. The hypothesis of the 'rational expectations' and the concept of the 'natural equilibrium' are shown to be the main theoretical pillars of the NCM. In this regard, the NCM is still very akin to the old 'monetarist' theoretical framework, the only difference being the choice of the degree of empirical relevance versus logical coherence of the models. In Section 4 we deal with the monetary side of the NCM, by showing that this is characterized by light and shade. On the one hand, the adoption of a (weakly) endogenous theory of money represents an advance compared to the 'monetarist' claim to target some monetary aggregate. On the other hand, banks and financial markets are neither included nor mentioned in the NCM, which relies essentially on a non-monetary framework. This is the reason why it can hardly be employed in (qualitative) long-term forecasting of the macroeconomic dynamics of today's financially-sophisticated capitalist economies. In Section 5 we provide an overview of a somewhat 'heretical' branch of the NCM, which is based on a seminal insight of the current chair of the Federal Reserve, Ben Bernanke, and aims to address the issue of the impact of changes in the financial structure on the real economy. In Section 6 we discuss a 'double-amended' NCM model in order to show that few small adjustments are sufficient to obtain a dynamics of fundamental variables which is in contrast with standard NCM policy prescriptions. Finally, some further remarks are provided in Section 7.

[3]Two points would be worth to be further analysed here. First, the operation of Central Banks is portrayed in terms of policy interest rate. However, this does not mean that the Central Bank acts as lender of last resort (in the sense of Bagehot) to banks. Second, the financial sector is always assumed to be passive and 'stable' in the basic NCM model.

[4]The standard version of the DSGE-RBC model can be found in Prescott (1986)[43].

2 Phisiology of the basic NCM model

As has been clearly pointed out by several authors, be they either supporters or critics of the NCM approach, this latter relies on a specific class of DSGE models. The analytical core "is essentially based on three [macroeconomic] equations. These are an aggregate demand equation; a price, or rather, an inflation equation, and an interest rate rule" (Lavoie 2006[33], p.168). Each macroeconomic equation, in turn, is strictly 'micro-founded' where that is taken to be optimising behaviour under constraints. More precisely, every relationship between 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.[5] In simple algebraic terms, the basic NCM model is:[6]

$$Y_t^g = a_0 + a_1 Y_{t-1}^g + a_2 E(Y_{t+1}^g) - a_3[r_t - E(\pi_{t+1})] + \epsilon_1, \tag{1}$$

$$\pi_t = b_1 Y_t^g + b_2 \pi_{t-1} + b_3 E(\pi_{t+1}) + \epsilon_2, \tag{2}$$

$$r_t = (1 - c_3)[RR_t^* + E(\pi_{t+1}) + c_1 Y_{t-1}^g + c_2(\pi_{t-1} - \pi^T)] + c_3 r_{t-1}, \tag{3}$$

where: $a_0, a_1, a_2, a_3, b_1, c_1, c_2 > 0; (b_2 + b_3) = 1$; and $0 < c_3 < 1$. Equation (1) corresponds to the IS curve. It shows that the output gap – viz. 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.[7] It depends also positively on the past and expected future output gaps.[8] Equation

[5]According to McCombie and Pike (2013)[37] these are indeed the 'paradigmatic heuristics' (or 'pseudo-assumptions') of the NCM model. In this regard, two aspects are worth of further comments: i. the hypothesis of perfectly rational expectations entails the presence of complete (perfect competition) future markets for every good and service traded in the economy; ii. rational-expectations-based micro-foundations are said to allow NCM modelers to employ 'deep structural' parameters which are assumed to be constant and hence unresponsive of the Lucas' critique (viz. the impossibility to predict the effects of a change in economic policies by using aggregative models and aggregate historical data). Yet, point (i) is clearly unrealistic, whereas point (ii) leads to paradoxical conclusions (such as the irrelevance of an autonomous investment function and the impossibility of involuntary unemployment) and raises a problem of the fallacy of composition. In addition, it is usually recognized that "the predictions of the simplest models with microeconomic foundations appear no more accurate than those of the corresponding *ad hoc* formulations in IS-LM-AS" (Romer 2000[45], p. 153). An analysis of the role of both rational expectations and micro-foundations in the NCM modelling is, however, beyond the aim of this paper. On this point, we refer the reader to Da Silva (2009)[17].

[6]We resume the formulation proposed by Arestis and Sawyer (2004[4], 2006[5], 2008[6]) and Arestis (2007[2], 2009[3]) in their critical appraisal of the NCM. This, in turn, is drawn the path-breaking NCM work of Clarida *et al.* (1999)[16]. For the sake of simplicity, we neglect the foreign sector.

[7]As has been observed, here clearly emerges the separation between demand and supply, with the (growth of) potential output being supply-determined.

[8]Equation (1) is derived by households' consumption equation that arises, in turn, from the single agent's optimal saving allocation. More precisely, it is assumed that agents prefer to smooth consumption over time. Consequently, expectations of higher output next period lead to higher consumption and output today. Similarly, the (real) interest rate level affects the inter-temporal substitution of current vs. future consumption. An autonomous

(2) corresponds to the 'accelerationist' (or expectations-augmented) 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.[9] For this reason, it is sometimes called the 'inflation-adjustment (IA) line' (see Romer 1999[45]; and Taylor 2000[51]). Equation (3) is the monetary policy rule or the reaction function of the central banker. It incorporates the well-known 'Taylor rule' (see Taylor 1993[48], 1999[50]), according to which the change in nominal interest rate set by the central bank should be a positive function of the 'natural' real interest rate, the expected future inflation rate, the past output gap, and the past inflation gap (that is, the deviation of the actual inflation in previous period from its target value).[10] In formal terms, it is usually drawn from the minimisation of the 'loss function' of the central banker, "where the losses for each period are a weighted average of terms quadratic in the deviation of inflation from a target rate and in some measure of output relative to potential" (Woodford 2003[57], p. 381) and the constrain is given by equation (2). However obtained, since prices are sticky and changes in expected inflation are taken into account, when steering the nominal rate, central banks "are effectively deciding how to set the real rate" (Romer 2000[45], p. 155). Consequently, the policy rule "replaces the LM curve [within the IS-LM-AS model], along with its assumption that the central bank targets the money supply, with an assumption that the central bank follows a real interest rate rule" (Romer 2000[45], p. 150). Finally, notice that combining equation (1)

investment function of firms is not included in the model, but this is said "not [to] affect any qualitative conclusions" (Clarida *et al.* 1999[16], pp. 1665-1666).

[9]As has been observed, "[t]here are two assumptions here. The first is that the immediate impact of an increase in aggregate demand falls entirely on output. [...] The second assumption is that when output equals it natural rate and there are no inflation shocks, inflation is steady. This assumption fits the evidence that there is inflation inertia" (Romer 2000[45], p. 158-59). As in the old IS-LM-AS model, output's impact on inflation "can operate directly through firms' price-setting decision, or indirectly through wages. The lack of complete nominal flexibility [...] can be justified on the basis of adjustment costs, imperfect competition, or contracts" (Romer 2000[45], p. 152). Coherently, equation (2) is usually derived "in terms of staggered price-setting by firms with some degree of market power" (Taylor 2000[51], p. 92). In other words, it is obtained from an explicit optimization problem: that of maximizing profits under a constraint on the frequency of future price adjustments (see Clarida *et al.* 1999[16], p. 1666).

[10]The natural interest rate is sometimes labelled as the 'neutral' (instead of 'natural') interest rate, "since fiscal policy can influence this neutral real rate of interest and so it is not very 'natural"' (Allsopp and Vines 2000[1], p. 9). Notice that the Taylor rule has been initially obtained as the result of an empirical search (see Taylor 1993[48], 1994[49]). On the 'positive analysis' side, a simple numerical specification of the rule is: $r = 4 + 1.5(\pi - \pi^T) + 0.5Y^g$. This describes the US monetary policy over the period 1987-92. Notice also that if the target (real) interest rate did not depend on inflation, its (exogenous) setting would produce explosive inflation or deflation (see Romer 2000[45]). More precisely, without a policy rule, there would be no 'nominal anchor', and "inflation would be increasing, or decreasing, without limit" (Allsopp and Vines 2000[1], p. 11), except for the equilibrium level of output. Furthermore, a policy rule which just relies on current inflation is not sufficient to (rapidly) remove the effects of a demand shock. The output-gap, and hence the expected inflation, must be explicitly included in the reaction function of the central bank to assure the stability of the economic system.

with equation (3) gives a negative sloped relationships between inflation and output gap, acting as the aggregate demand function of the model (see, among others, Romer 2000; Taylor 2000).[11]

Plainly, the closure of the model (1)-(2)-(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 (inflation and output) values 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).[12] Consequently, there is some room for public intervention in the short run, though mainly through the 'scientific' steering of the target interest rate, and just in order to anchor agents' inflationary expectations. By contrast, agents' forecasts could not be systematically wrong over time. The assumption that agents know the right economic model and can use all information efficiently (i.e. the rational expectations hypothesis) remains the first theoretical pillar of the NCM, as it was in the old one. Exogenous non-systematic shocks may affect the equilibrium in the long run: in equations (1)-(2)-(3) this random component is 'captured' by ϵ_i (with $i = 1, 2$). But, apart from this, any systematic economic policy is doomed to leave real magnitudes (notably, output and employment rate) unchanged. 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. This result is the NCM equivalent of the old well-known Neoclassical-Monetarist principle of the 'neutrality of money'.

The trend (over 100 periods) in output gap, inflation rate and interest rates within the artificial NCM economy outlined by equations (1)-(2)-(3) is is portrayed in Figure 1. A shock (+10%) to the autonomous demand component a_0 – viz. a fiscal stimulus, in our example – has been imposed in period 25. As NCM authors would argue, the positive effect of the fiscal stimulus on the economy is shown to be absorbed after a (relatively low) number of periods, whereas the increase in both inflation and interest rates is of permanent nature.[13] An important corollary is that an expansive fiscal policy can affect neither the long-run volume of output nor its long-run growth rate, but only its composition. The monetarist 'crowding-out' effect of government intervention on private spending, due to the increase in the real interest rate, remains

[11] In algebraic terms: $Y_t^g = a_0 + [a_1 - a_3(1 - c_3)c_1]Y_{t-1}g + a_2 EY_{t+1}^g - a_3\{1 - c_3[RR_t^* + c_2(\pi_{t-1} - \pi^T) + c_3 r_{t-1}\} + \epsilon_1$. Notice that "[m]ovements along this curve occur when inflation [...] changes and the central bank changes the real interest rate, causing real GDP [...] to change". Notice also that this curve is "the relationship between the inflation rate and the real GDP, rather than between the price level and real GDP" (Taylor 2000[51], p. 92).

[12] Actually, the natural level (or growth rate) of output is not necessarily that at which all markets clear at a competitive equilibrium, assuring the full employment of labour-force. Rather, it is sometimes described as "that level of output at which 'competing claims' are reconciled" (Allsopp and Vines 2000[1], p. 5). The former definition corresponds to the Friedman's one, whereas the latter entails the different concept of the 'non-accelerating rate of unemployment' (NAIRU).

[13] Similarly, it is possible to show that a negative shock entails a temporary reduction in output (compared to its natural level) coupled with a permanent reduction in inflation and interest rates.

confirmed. In this regard, the only difference between the NCM and the monetarist approaches turns out to be the different opinions about the lifetime of the imperfections and asymmetries characterizing the real world economies, i.e. about the 'actual length' of the short run.[14]

3 Natural equilibrium and the role of demand in the NCM

In addition to rational expectations, the other theoretical pillar of the NCM is the natural (or long-run or trend) equilibrium. This latter is defined as the state towards which a fully competitive economy would tend in the long run, namely, when inflation expectations of agents are utterly fulfilled. In the natural equilibrium state output volume and employment rate are mainly determined by three fundamentals: 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); iii. the available technology (i.e. the production function of firms). Against this background, the mechanics of the NCM model is rather straightforward: a departure of output from its natural volume (or natural growth rate) "causes inflation to change, which causes the central bank to change the real interest rate,[15] which moves output back to toward normal" (Romer 2000romer:2000, p. 160). The institutional structure of the economy, including prevailing conditions on the labour market, is sometimes considered as well,[16] but the natural output is always treated as an exogenously-given variable.

Yet, the concept of the natural equilibrium has been the subject of a long-lasting debate between mainstream and dissenting scholars since the mid 1970s (...). In our opinion, the notion of the natural equilibrium raises two major criticisms. Firstly, as has been already argued (see Fontana and Passarella 2013[25]), such a concept strictly relies, in turn, on the very rational expectations hypothesis. The reason is that the long run is defined as the hypothetical state in which the expected price level (or the expected inflation) exactly matches the actual price level (or the actual inflation). In the real world economies, this could occur just by chance. However, the original definition of 'long run' has been subjected to a semantic shift over time, ending up meaning a period which is long enough to allow market forces to fully de-

[14]Fiscal policy also affects the effectiveness of the monetary policy. However, NCM authors usually stress that this "certainly does not mean that fiscal policy should not be used". This, rather, means that it should be used as "a policy tool in controlling inflation and in the stabilization of the economy" (Allsopp and Vines 2000[1], p. 19), and that monetary policy needs to take into account fiscal policy's effects.

[15]The raise (reduction) in the interest rate when the inflation rate is above (below) target is called the 'nominal-anchor function' of monetary policy; the raise (reduction) in the interest rate in response to a positive (negative) shock affecting the demand is called the 'stabilizing function' of monetary policy (see Allsopp and Vines 2000[1], p. 11).

[16]More precisely, institutions are introduced as constraints ruling economic interactions among agents (such as budget constraints, price-setting rules and policy rules).

ploy.[17] Such a shift is not neutral, since it entails that crises affecting the real-world economies cannot be long-lasting states. By contrast, it would suffice to take cognizance of the fact that real-world economies are always marked by radical uncertainty, to regard the long run as a mere abstract hypothesis and the short run as the normal condition, requiring a permanent intervention of public authorities (see Fontana and Passarella 2013[25]). Secondly, real world economies are essentially *non-ergodic* and *path-dependent* systems. This means that 'sample moments (averages, variances, etc.) do not converge on their true values over time' (Hanngsen, 2006[30], p. 208). In addition, economic variables do not progress steadily toward an exogenously-given unique and stable equilibrium. They can reach several (sub-optimal) equilibria, and every equilibrium achieved depends, partly to least, on the dynamic process of getting that position. To put it differently, real world economies do not swing around the equilibrium state like the clock pendulum. The reason is quite straightforward: once productive capacity has been wasted, workers have not been trained, and investments have not been undertaken, it is not possible to turn back to the previous potential output, as if nothing happened (see Setterfield 2002[47], p. 5). On the whole, it is not clear *how* (that is, the specific path through which) the natural equilibrium would be reached in the long run. The achievement of such an optimal equilibrium is simply postulated.[18] But, if there was no *exogenously-given* long-run equilibrium, the 'crowding-in' effect of policy measures aiming to achieve the full employment of available resources would be likely to more than offset the (possible) 'crowding-out' effect. In other words, to the extent that it is admitted that the potential output is *not* independent of the short-run effective demand, the NCM usual story does not hold.

In order to clarify this point, we can use a simplified version of the previous 3-equation NCM model. The new model is defined as follows:

$$Y_t = \alpha_0 - \alpha_1(r_{t-1} - \pi_{t-1}) + \epsilon_1, \tag{4}$$

$$\pi_t = \pi_{t-1} + \beta_1(Y_{t-1} - Y^n_{t-1}) + \epsilon_2, \tag{5}$$

$$r_t = \pi_t + RR^*_t + \gamma_1(\pi_{t-1} - \pi^T) + \gamma_2[Y_t - E(Y^n_{t+1})], \tag{6}$$

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 actual output volume (or the actual growth rate of output), instead of its gap with the natural volume (or the natural growth rate), Y_n.[19] As we have already mentioned, the parameter RR^* in equation (6) is the real rate of interest assuring the (ex ante) matching of savings and investment at the natural level of output (see Arestis 2009[3], p. 7). It corresponds to the Wicksellian 'natural rate of interest' and can be derived by using equation (4) in equation (6).[20] Then, by imposing that the

[17]This historical concept is what Alfred Marshall would have labelled the 'long period' as opposed to the logical concept of the 'long run'.

[18]Incidentally, this criticism is shared also by the (neo) Austrian school of economics.

[19]Obviously, the following holds: $Y_t = Y^n_t + Y^g_t$

[20]The revival of the category of the 'natural rate of interest', developed in the 1920s by the Swedish economist Knut Wicksell, is the reason why NCM authors are sometimes

actual inflation rate equals the target rate and that the output gap is nil, we obtain:

$$RR_t^* = \frac{\alpha_0 - Y_t^n}{\alpha_1}, \tag{7}$$

If the central bank sets the parameter RR_t^* in accordance with equation (7), then the economy adjusted at its natural equilibrium, and the system (4)-(5)-(6)-(7) behaves like the system (1)-(2)-(3). The only long-run effect of an increase in government expenditure will be an increase in nominal and real interest rates. This ends up crowding out the private sector expenditure over time.[21] Furthermore, if one assumes that there is no lag in the effect of the real interest rate on output, as reported in equation (4), the actual inflation rate equals the target rate in the long run.

Yet, as we have already mentioned, the assumption that potential output volume (or its growth rate) is an exogenous variable has been criticized by several authors. Labour productivity (think to the impact of workers' learning by doing, technological innovations and investment in fixed capital) and the availability of labour-force (think to migration flows) are strictly linked to the

labelled 'Neo Wicksellian' (see Woodford 2003[57]). By contrast, the *degree* of Keynesianism of the NCM is most debated. The NCM is usually regarded as being 'New Keynesian' by its proponents (see, among others, Clarida *et al.* 1999[16]; Romer 2000[45]; see also Dixon 2008[18]). Yet, in terms of our 3-equation system, the only one which could be seen to have a (neo) Keynesian 'pedigree' would be equation (2), viz. the Phillips curve. This latter is supposed to have a coefficient on expected inflation equal to $1/(1+r_t) < 1$ and hence to be slightly *upward-sloping* rather than vertical – albeit that, in an economy with low inflation, it could be around 0.90 to 0.95 (see Sawyer 2013[46] and Arestis and Sawyer 2008[6]). This lack of an authentic Keynesian nature of the NCM is usually pointed out by (a part of) the Post Keynesian authors. For instance, according to McCombie and Pike (2013[37], p. 498), the NCM "essentially consists of a general dynamic stochastic general equilibrium model". Although rigidities are accounted for, "the benchmark is still the real business cycle" (on the same position, see also Goodfriend 2004[27]). For Lavoie (2006[33], p. 177), the NCM "is simply a variant of monetarism, but without any causal role for money". Notice, however, that for the central bank to be able to affect the *real* interest rate, prices cannot be completely flexible. Thus, according to other authors, the very assumption that the central bank targets the real interest rate through a policy rule "makes the model Keynesian" (Romer 2000[45], p. 155). This position is shared by the most part of NCM authors, such as Clarida *et al.* (1999)[16]. So, for Romer (2000[45], p. 168), NCM models "would be recognizable to Keynes, Hicks and their contemporaries". Similarly, Bernanke *et al.* (1999)[13] label the NCM as the 'Dynamic New Keynesian' framework. Other authors stay in the middle ground and explicitly recognize that the NCM is rather a "synthesis between the pre-Keynesian and the Keynesian paradigms [since] classical theory is appropriate in the long run, but that Keynesian theory is appropriate in the short run" (Allsopp and Vines 2000[1], p. 4). In our opinion, the point is that the assumption of nominal rigidities is seen as a chief feature of Keynes' *General Theory* by the New Keynesians (in the wake of Kahn 1984[31]), but not by the Post Keynesians.

[21] As has been pointed out, the NCM "in fact requires four equations, not three". The point is that embedded in the NCM view "is the belief that a lower inflation rate creates better conditions for the economy. [...] This means that with low rates of inflation, the natural growth rate is higher than otherwise" (Lavoie 2006[33], pp. 176-179). Others would, of course, argue that inflation aids faster growth over a range; significant point here would be that there is in NCM an inflation-neutrality assumption, though it also postulates an inflation target of circa 2 per cent; the loss function in the NCM approach to monetary policy assumes an 'optimal' rate of inflation.

current level of demand and output (see Setterfield 2002[47]; León-Ledesma and Thirlwall 2002[34]; Lavoie 2006[33]; McCombie and Pike 2013[37]; Sawyer 2013[46]). All these factors affect the future potential output of the economy. Following Lavoie (2006[33], p. 182), the basic NCM model should, therefore, be amended by introducing an additional equation:

$$Y_t^n = Y_{t-1}^n + \phi_1(Y_t^n - Y_{t-1}^n) + \epsilon_3, \tag{8}$$

with $\phi_1 > 0$. Equation (8) says that the short-run volume of effective demand affects the long-run potential or natural output. This "introduces the possibility of multiple equilibria, that make long-run supply forces dependent on short-run disequilibrium adjustment paths induced by effective demand" (Lavoie 2006[33], p. 181; see also Flaschel 2000[20], p. 460). A simulation of the system of equations (4)-(5)-(6)-(7)-(8) is reported in Fig. 2. This time, a positive shock on a_0 entails a permanent increase in the natural volume (or natural growth rate) of output.[22] Two obvious corollaries follow: i. to the extent that *hysteresis* of output is accounted for, discretional fiscal policy is effective also in the long run; ii. in the presence of a negative shock to the aggregate demand, there can be long-lasting 'involuntary unemployment' (see Lavoie 2006[33]; McCombie and Pike 2013[37] [see also Fontana and Palacio-Vera 2002[23], 2007[24]]).[23][24]

4 Monetary policy and the nature of money in the NCM

As we have anticipated in section 1, the consensus emerging in the late 1990s among mainstream economists was not confined only to the methodology to be

[22]Similarly, a negative shock entails a permanent reduction in the natural level of output. Notice further that in simulation reported in Figure 1 we introduced a one-period lag in equation (7). The higher is this lag, the higher is the hysteresis effect on output. [Notice that lags in equation (1) and (7) are fundamental, as they rule the reaction of the central bank – see Taylor 2000[51], p. 92; see also Allsopp and Vines 2000[1], pp. 9-10] [check also the lag on a_0, that is, on fiscal policy]

[23]This, of course, would require us to change the (first principles underpinning the) Phillips curve equation as well.Notice also that 'involuntary unemployment' is an empty concept in the mainstream models, because there cannot be coordination failures leading to lack of effective demand – in the long run at least. Under the original RBC-DSGE basic model, individuals can be unemployed only because they (prefer to) allocate their time to leisure activities, instead of working activities. Under the New Keynesian declension of the DSGE models, viz. the NCM model, unemployment may occur (also) because of the lack of instantaneous price flexibility (that is, because of temporary nominal price rigidities). This, in turn, is seen as the result of 'menu' or other adjustment costs affecting firms' price (or wage) setting. However, in the absence of price stickiness, unemployment would always be voluntary. Therefore, a problem of 'weak incommensurability' between the original NCM model and the proposed amended (Post Keynesian) version of the NCM model still remains (see McCombie and Pike 2013[37], p. 518).

[24]Plainly, if we drop equation (8) then the system (4)-(5)-(6)-(7) behaves as NCM authors would expect, that is, after a shock the economy returns to its long-run equilibrium (with the permanent effect being just on inflation and interest rates).

adopted in modelling. It concerned also the specific way in which a 'scientific' policy should have been conducted in practice. In a sense, the very concern about both the analysis and the driving of the real-world monetary policy seems to be one of the main differences between NCM and RBC authors.[25] According to Allsopp and Vines (2000[1], p. 2), there are five elements of NCM in the economic policy : 1. the main purpose of the intervention should be to provide a 'nominal anchor' to inflation expectations; 2. this purpose is better pursued by an independent central bank; 3. the main instrument of monetary policy is the short-term interest rate in the unsecured money market; 4. the steering of the interest rate should also account for stabilization purposes; 5. fiscal policy is admitted, but its adoption affects the effectiveness of the monetary policy, so that it should be employed for short-run stabilization purposes only (and then through automatic stabilisers rather than discretionary fiscal policy). Plainly, points 1 and 2 can be regarded as a success of the monetarist pre-analytical view. The emphasis on both the credibility of announcements of monetary authorities and the benefits of a 'conservative' central bank chair (in the wake of Rogoff 1985[44]) is now shared by the vast majority of mainstream economists, be they either 'monetarists' or (new) 'Keynesians'. Accordingly, the behaviour of monetary authorities must be expressed in the form of a 'policy rule', viz. a predictable reaction function depending on few economic variables. The rationale is to anchor agents' inflation expectations in the medium to long run (see Taylor 1994; Allsopp and Vines 2000). If the central bank credibly signals its intent to maintain inflation low in the future – it is usually argued – then it can also "reduce current inflation with less cost in terms of output reduction than might otherwise be required" (Clarida *et al.* 1999[16], p. 1670). A noteworthy corollary is that it is desirable to shift monetary policy's decisions from national governments to politically-insulated bodies.[26]

By contrast, points 3 to 5 differentiate the NCM analysis from that of the real business cycle (RBC) and other monetarist approaches. In particular, point 3 entails "the rejection of the exogenous supply of money, and the replacement of a money growth rule by a real rate of interest targeting rule" (Lavoie 2006[33], p. 177). Within the NCM, high-powered money "is not a variable the central bank is targeting, but rather one it is manipulating to make interest rates behave in the way it desires" (Romer 2000[45], p. 162).

[25]Sociologically, NCM authors are often policy-concerned men (rather than mere academic scholars), who are mainly interested in practical implications of the theory. Think to the assumption of price stickiness: although it is regarded by its own proponents as not completely satisfactory on the theoretical plan (because of the lack of rigorous micro-foundations), it has become the cornerstone of NCM modelling, because it "works beautifully in practice" (Krugman 2000[32]).On the epistemological plan, the very concern for practical policy implications of the models (rather than for their theoretical pureness and logical consistency) might be regarded as another 'Keynesian' attribute of the NCM practitioners. For instance, Bernanke *et al.* (1999[13], p. 6) argue that they take the NCM model as the starting point of their analysis because "it is possible to study monetary policy with this framework". On the controversial link between the NCM and the thought of Keynes, we again refer the reader to note 20.

[26]For a thorough analysis of this aspect, we refer the reader to Major (2012[36]) and Fontana and Passarella (2013[25]).

In this sense, the Post Keynesian argument that money supply is "endogenous and demand-led, seems to have been accepted by the better-known New Keynesian economists [who] now argue in terms interest rates determined by central-banks, going so far as to posit that central banks have the power to determine real interest rates" (Lavoie 2006[33], p. 166). According to Woodford (2009[58], p. 13) monetary policy needs not be theoretically identified with the control of the money supply, mainly because "at most of the central banks with explicit commitments to an inflation target, monetary aggregates play little if any role in policy deliberations". The same position has been anticipated by Romer (2000[45]), according to whom, over the 1980s-1990s, a number of developments in both economic theory and institutional environment challenged the traditional IS-LM-AS model. On the theoretical side, the main issue was that different interest rates were relevant to different parts of that model.[27] Furthermore, it was necessary to replace the price level with the inflation rate,[28] and to shift the focus from monetary aggregates to the steering of the interest rate in conducting policy. This, in turn, was seen as the consequence of a long-lasting change in the actual institutional environment: "the dominance of interest rates over monetary aggregates in the conduct of monetary policy – it was argued – is not a recent phenomenon. In the United States, for example, only in the 1979-1982 period did monetary aggregates play a significant role in policy" (Romer 2000[45], p. 155).

Yet, in the NCM basic model, like in the monetarist one, the two principles of the ineffectiveness of the fiscal policy and of the neutrality of money still hold in the long run. As we have shown in section 2, an expansionary *fiscal policy* would eventually lead to an increase in the inflation rate, an even higher increase in the nominal interest rate, and therefore an increase in the real interest rate, without any positive impact on the real output. Similarly, a restrictive *monetary policy* would eventually lead to lower inflation rates, without any 'negative' impact on the real interest rate and the real output (see Lavoie 2006[33], p. 166). In other words, in the long run, money returns to be the Neoclassical 'golden veil' exogenously put on real items. The reason of this theoretical ambiguity is that – as has been observed by Fontana (2009[22]) and Fontana and Setterfield (2010[26]) – NCM authors regard the 'endogeneity' of money as a historical accident, rather than as an intrinsic feature of a monetary economy of production. Money is taken as an endogenous magnitude just because of the need to model the actual behaviour of central banks, which manage to steer the real interest rate thanks to real-world imperfections and asymmetries. To put it differently, money is endogenously created "in the sense that the stock of money is a 'residual' based on the demand for money" (Arestis and Sawyer 2006[5], p. 848). But, in the absence of any institutional 'friction', the supply of money would be an exogenous magnitude. This conclusion should not sound that surprising: NCM authors, like old and new monetarists, keep on assuming that the central bank is able to fine-tuning

[27]More precisely, in the traditional IS-LM-AS model, the real rate of interest affects the IS curve, whereas the nominal rate is relevant to the LM curve.

[28]Notice that Wicksell's arguments were in terms of price level, not in terms of rate of change of prices (see Sawyer 2010[insert] [Intervention; add Giuseppe's considerations]).

the monetary base – though just in order to make interest rates behave in the way the central bank desires. It is true that some NCM authors, such as Allsopp and Vines (2000[1], p. 7), show somewhat more than a mere functionalist approach to the analysis of the nature of money, by explicitly recognizing that: i. "nearly all 'money' is the product of the private banking system"; ii. the "short-term interest rate [...] influences the behaviour of commercial banks by determining the price at which they lend"; iii. "[s]ince nearly all money is 'inside money' stories of the monetary transmission mechanism based on the real balance effect [...] are also unrealistic".[29] However, even in this case, there is no room for a thorough analysis of the role of credit-money as the fundamental institution (along with the wage-labour contract) of the capitalist economy, let alone for an analysis of the process of money creation. This also explains why the spectre of the loanable fund theory (and other 'exogenist' approaches) continuously reappears in the NCM. Even looking at the non-formal modelling literature, no clear distinction between banks (as capitalist institutions which create credit-money *ex nihilo* and whose liabilities are commonly accepted as means of payments) and financial intermediaries (operating as mere clearing houses) is ever made (see Sawyer 213[46]; and Passarella 2013a[41]). Overall, the predominance of internal money over external money is simply recognized as an *empirical fact* to be accounted for through a different closure of the model (viz. through the exogenous setting of the target interest rate, instead of some target monetary aggregate).[30]

This very functionalism in the theory of money leads to the epistemological reductionism of the NCM in policy. According to NCM authors, "how monetary policy should respond in the short run to disturbances that buffet the economy [should be considered as] the essence of the contemporary debate over monetary policy" (Clarida *et al.* 1999[16], p. 1668). Insofar as the central bank is able to steer the real interest rate, "this is sufficient – it is claimed – to solve the 'instability problem' described in Keynes's *General Theory*" (Allsopp and Vines 2000[1], p. 11). Notice that, here, the instability is none other than the result of an exogenous shock affecting the aggregate demand level: in the absence of external shocks, no (expansionary) intervention is admitted, as the economy will stabilize around its own natural growth path anyway. Yet, recent financial twin-crises in the US and the current economic recession affecting the Euro Area have resoundingly contradicted this assumption, by forcing central banks to adopt repeated 'unconventional' measures.[31] Furthermore, the exis-

[29]These sentences also confirm that the main concern of NCM authors is the realism or, better, the practical use of the models, rather than their theoretical accuracy. See note 25.

[30]As is explicitly recognized, "many empirical DSGE models, such as the Smets-Wouters model, make no reference to money, though they include an equation describing monetary policy, and imply that the specification of that equation matters a great deal for the dynamics of both nominal and real variables" (Woodford 2009[58], p. 13).

[31]The role of monetary policy in the NCM has raised several criticisms. Arestis and Sawyer (2006[5], pp. 849-853) have provided a long list of problematic issues. First, the impact of changes in the rate of interest on inflation is small and unpredictable, whereas the impact on investment and, therefore, on the future capital stock, can be much more remarkable. Second, if inflation is a demand-led phenomenon, then monetary policy is not the most effective way of influencing aggregate demand; if it is not (for instance, because

tence of natural equilibrating tendencies is not the only shaky assumption of the NCM. As we have mentioned, the NCM relies on the hypothesis of price stickiness, because it is only when prices are not perfectly and instantaneously flexible that the central bank can affect real variables through the steering of the (real) interest rate. However, differently from demand shocks, monetary shocks do not entail significant aggregate real effects, because (if money is internal) prices endogenously vary in response to changes in the amount of money. Moreover, if we considered firms as a consolidated sector, "price stickiness disappears even when the time of price adjustment is staggered. Hence, monetary shocks are neutral and the New Keynesian explanation of cyclical fluctuations in employment is considerably weakened" (McCombie and Pike 2013[37], p. 519; referring to Caplin and Spulber 1987[15]). Thus, however paradoxical, the NCM ends up representing a step backward on the ground of the logical consistency of formal modelling compared to the RBC, without representing a significant step forward on the heuristic plan.

5 Financial markets and financial instability in the NCM

As has been authoritatively argued, NCM models employed by central banks' staff for long-run forecasting purposes are vitiated by "fatal flaws" (Foley and Farmer 2009[21], p. 685). In spite of the intentions of NCM proponents, these flaws concern the very aptitude of the basic model to grab fundamental aspects of the working of today's financially-sophisticated capitalist economies, such as their tendency to financial turmoil and to prolonged recessions. Yet, still in the spring of 2000, one of the founding fathers of the NCM, John Taylor, released a paper in which he declared that the basic model "fits the data well and explains policy decisions and impacts in a realistic way" (Taylor 2000[51], p. 93). Unfortunately, the first of the two financial crises which hit the US economy in the decade 2000-2010 was breaking out at the same time, triggered by the burst of the 'dot-com' bubble.[32] The point is that NCM models, like

inflation is a cost-push phenomenon), then the NCM does not provide any clear treatment of it. Third, NCM authors assert that the real rate of interest is adjusted by central bank such that the economy moves to equilibrium. However, the corresponding nominal rate of interest could be either negative or positive but too low to be attainable. Fourth, the interest rate could have a too little effect on investment and savings. Fifth, the domestic natural rate of interest could be inconsistent with foreign rates. Sixth, the central bank could not have all the information needed to steer the interest rate at its natural level. In addition, "[t]he validity of the use of a quadratic loss function involving inflation and output gap [as the microeconomic foundation of the interest rate rule] and the assumption that trend output has some optimal properties have both been questioned" (Arestis and Sawyer 2008[6], p. 776). The reason is that those hypotheses rely, in turn, on the controversial assumption that supply potential is not affected by current demand. Finally, the theoretical and empirical validity of the New Keynesian Phillips's curve is highly disputed as well.

[32]Interestingly enough, according to Taylor, both crises would be the result of the *too low* level of the target interest rate set by the Federal Reserve. This turned out to inflate financial asset and real-estate bubbles, therefore creating the conditions for the subsequent economic and financial meltdown (see Taylor 2007[53], 2009[54], 2010[55]).

all DSGE models, "assume a perfect world, and by their very nature rule out crises of the type we are experiencing now" (Foley and Farmer 2009[21], p. 685).[33] As Lucas stated, recent crises were not predicted because DSGE models predict that such events cannot be predicted, since DSGE simulations 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[35]). In this regard, one of the main issues (which is theoretical, but also pregnant with practical consequences) with the DSGE-NCM is that its basic model eventually relies on both the 'efficient market hypothesis' (EMH hereafter) and the 'Modigliani-Miller theorem' (M&MT hereafter), in the medium to long run at least (see Passarella 2013b[42]).[34] As a result, given an *enough long* period of time, money and finance would not affect output and employment, but only inflation and 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 the real economy.[35] However, such a theoretical result is glaringly confuted by the whole empirical evidence.

The explicit analysis of the possible interaction between the real economy and the prevailing conditions in finance and credit-markets is the subject of a somewhat 'heretical' sub-class of New Keynesian theories and models, mainly developed by Bernanke, Gertler and Gilchrist during the 1980s-1990s (see Bernanke 1981[8], 1983[9]; Bernanke and Gertler 1989[11]; Bernanke *et al.* 1996[12], 1999[13]). We refer to the literature on the so-called 'financial accelerator mechanism' (FAM hereafter), where the assumption of informational asymmetries between firms or entrepreneurs (in the role of investors or borrowers) and financial intermediaries (as lenders, allowing firms to meet households or savers) makes both the EMH and the M&MT inapplicable. More precisely, the *two basic hypotheses* underpinning the FCM are: i. informational asymmetries entail higher costs of 'external' finance, as compared to 'internal' funds, in the form of agency costs (linked to the monitoring by the lender and bankruptcy risks);[36] ii. *ceteris paribus*, the higher the amount of 'collateralizable' net worth of firms, the lower will be the (expected) agency costs. At the

[33]Notice that Foley and Former (2009[21], p. 685) explicitly propose to replace DSGE models with agent-based models (ABMs hereafter) which "potentially present a way to model the financial economy as a complex system, as Keynes attempted to do, while taking human adaptation and learning into account, as Lucas advocated". However, it is too early to say whether ABMs could be a helpful alternative to both DSGE models and old-fashioned Keynesian econometric models. Also notice that another way to model the medium-run dynamics of capitalist economies is the stock-flow consistent method (SFC hereafter) developed by Wynne Godley and the scholars of the Levy Institute. However, a thorough analysis of the current state of formal modelling in economics is beyond the scope of this paper.

[34]According to the EMH, prices of traded assets always reflect all available information. According to the M&MT, under a number of restrictive assumptions, the value of a firm is unaffected by *how* that firm is financed.

[35]As we have mentioned, in the NCM basic model, described by equations (1)-(2)-(3), investment merely adjust to fit household inter-temporal preferences. On this point, we again refer the reader to notes 5 and 8.

[36]This cost is also defined as "the inevitable deadweight loss that arises because of asymmetric information" (Bernanke *et al.* 1996[12], p. 2).

macroeconomic level, *two implications* follow: i. to the extent that net worth of firms moves pro-cyclically (in the wake of cash-flows and asset prices), the premium on external finance rises in recessions and reduces in booms, therefore increasing investment fluctuations and enforcing cyclical persistence; ii. not only demand shocks, but also shocks affecting net worth of firms (as occurs in a debt-deflation crisis) can trigger real fluctuations (see Bernanke and Gertler 1989[11]). Thus, during recessions (booms), the fall (rise) in firms' net worth increases (decreases) the premium on external funds, while increasing (decreasing) the need for finance, therefore reducing (boosting) investment and output. This is the core of the FAM: an initial shock to demand, however small, is likely to be amplified by the change in balance-sheets of firms and, more generally, by conditions in finance and credit markets. Plainly, such dynamics is "intrinsically nonlinear", since the final impact of the FAM on output depends on the current level of internal finance of firms. More precisely, the deeper the economy is in recession, the lower is the internal finance, and hence the stronger will be the autoregressive movement in output (see Bernanke and Gertler 1989[11], pp. 14-15; Bernanke *et al.* 1996[12], pp. 3-4). This, in turn, will negatively affect demand for inputs of firms, which will be accumulating an excess of inventories, while reducing the employment level and/or real wages bargained with workers (see Greenwald and Stiglitz 1993[29], p. 109).

Significantly enough, references to an exogenously-given natural volume (or rate of growth) of output are rather rare in the FAM literature. On the one hand, it is clearly stated that the methodological starting point of the FAM is DSGE models. On the other hand, FAM authors openly "abstract [...] from long-term financial relationships" (Bernanke and Gertler 1989[11], p. 15) in their works. This is remarkable for it that 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[13], p. 6) call it – analysed in RBC works. In other words, the long run is implicitly regarded as a set of (unrealistic) assumptions, rather than as an actual historical tendency of capitalist economies. But if the relationship between price stickiness and price flexibility is to be reversed, short-run sub-optimal equilibria become the rule, and so does public intervention. This hint of heterodoxy is strengthened by the repeated reference of FAM authors to Fisher's (1933[19]) debt-deflation theory and also by some veiled reference to Minsky's (and Kalecki's) theory of the increasing risk of investment activity.[37] In fact, lender's agency costs discussed by FAM authors can be easily compared to the Minskian 'objectivation' of the lender's risk into interest rates, fees and commissions firms have to pay on external funds (see Minsky 1986[40]). The heterogeneity of agents is another unorthodox feature of the FAM models: although they do not clearly distinguish banks from other financial intermediaries, FAM authors "step outside the convenient representative-agent paradigm [since] the distribution of wealth affects the dynamics of the economy in a nontrivial way" (Bernanke *et*

[37]By contrast, explicit cites to Minsky's works are very rare. Among the few exceptions, see Bernanke *et al.* (1999[13]), who refer generically to Minsky's theory, and Bernanke (1983[9]) who quotes Minsky (1977[39]).

al. 1996[12], p. 3-4). The reason is that a reallocation of lending in recession from firms whose net worth is decreasing to a safer alternative is likely to occur, triggering a 'flight-to-quality' (or 'flight-to safety') process. This, in turn, increases the financial fragility of economic units. 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. An important corollary is 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[12], p. 6; see also Bernanke and Blinder 1988[10]). To put it differently, monetary policy affects output and other real magnitudes not as much because prices and/or wages are sticky (as is assumed in the basic NCM model) as because the access to external finance has a crucial impact on investment demand (and production plans) of firms. In this sense at least, the Post Keynesian and 'circuitist' argument that 'finance to production matters'[38] seems to have eventually been accepted by a part of the mainstream, even though the distance in terms of policy implications is still rather relevant.[39]

6 Finance matters: a further amendment to the NCM model

In the wake of the standard DSGE methodology, the FAM is usually obtained through a process of micro-foundation of the macroeconomic dynamics.[40] As we have mentioned, this is put in practice by considering a production (or investment) technology that involves asymmetric information between entrepreneurs (who have direct access to the technology) and lenders (who have not). In addition, it is assumed that lenders incur agency costs in order to observe returns on firms' investment. Such costs, in turn, are assumed to be a decreasing function of the soundness of borrower's balance-sheet, viz. of net wealth of firms. Finally, since net worth is likely to move pro-cyclically, agency costs will behave counter-cyclically, therefore improving lending conditions in booms and worsening them in recessions. Thus, the (macroeconomic) "accel-

[38]As we have already mentioned, another remarkable difference concerns the analysis of the circuit of monetary payments among different social groups (or classes), and the linked distinction between the role of banking sector and that of financial markets. Such an analysis is totally neglected in the FAM framework, where banks are likened to pure financial intermediaries. For an overview of the current state of the 'circuitist' debate, see Passarella (2013a[41]) and Sawyer (2013[46]).

[39]In the NCM, monetary policy is still regarded as the preferential, if not the unique, instrument of public intervention (see Arestis and Sawyer 2008[6]). However, as we will argue in the next section, the recognition of the role played by marketable financial assets as collateral in financing should logically lead to a change in the main target of monetary policy.

[40]The declared reason is that "[f]inancial contracts and institutions are endogenous, so that results that hinge on arbitrary restriction on financial structure are suspect" (Bernanke *et al.* 1996[12], p. 4).

Table 1: Four different versions of the NCM model

Features	No finance	Finance (accelerator)
No demand l/t eff.	(I) Basic NCM	(III) Basic FAM
Demand l/t eff. (hysteresis)	(II) Emended NCM	(IV) Emended FAM

erator effect of income on investment" (Bernanke *et al.* 1996[12], p. 27) is brought back to a simple (microeconomic) principal-agent scheme.

However, since the beginning of this paper, we have chosen not to conduct our analysis from the optimizing behaviour of some single individual agent. We will maintain this policy in the current section as well.[41] Furthermore, for the sake of simplicity, we will not introduce any heterogeneity among firms (for instance, between large corporations and small firms), but only between borrowing firms and lending banks. This said, the simplest way to include the FAM discussed in Section 5 within the basic NCM model discussed in Section 2, without referring to first principles, is to replace equation (1) with the following:

$$Y_t^g = a_0 - a_1 Y_{t-1}^g + a_2 E(Y_{t+1}^g) - a_3[r_t - E(\pi_{t+1})] + a_4 h_{t-1} + \epsilon_1, \qquad (9)$$

where:

$$h_t = h_{t-1} + \omega Y_t^g + \epsilon_4, \qquad (10)$$

where $h > 0$ is the net worth of investing firms, $\omega \geq 0$ is the share of aggregate (retained) profit and capital gains in total output (gap), and $a_4 > 0$ is the sensitivity of total output (gap) to change in credit-worthiness of firms, through a change in investment financing. The basic idea underpinning equations (9) and (10) is that investment activity, 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. Notice 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 (indirect channel). Whatever the prevalent channel, the result is a strengthening and extension of the (however temporary) effect of current demand on output and employment levels (see Figure 3).

In Table 1 all the four versions of the New Keynesian DSGE model we have discussed in this paper – notably, the basic NCM model (I), the augmented NCM model (II), the basic FAM model (III), and the emended FAM model (IV) – are reported. Model (IV) is a modified version of model (II) discussed

[41] As we have already mentioned, the rationale is two-fold: first, capitalist economies are complex systems whose overall behaviour cannot be derived from a process of *aggregation* of behavioural equations of single identical rational agents; second, rational-expectations-based micro-foundations do not actually allow modellers to tackle the Lucas' critique (as argued by Da Silva 2009[17]) and, therefore, for the *Ockham's razor*, they should be dropped.

in Section 3. It takes into account the cumulative effect of change in financial-asset prices on investment activity, as 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 (though just in an unlikely long run). In algebraic terms, it has been obtained by replacing equation (4) of model (II) – provided in Section 3 – with the following:

$$Y_t = \alpha_0 - \alpha_1(r_{t-1} - \pi_{t-1}) + \alpha_2 h_{t-1} + \epsilon_1, \tag{11}$$

where:

$$h_t = h_{t-1} + \omega(Y_t - Y_t^n) + \epsilon_4, \tag{12}$$

Consequently, equation (7) must be replaced by:

$$RR_t^* = \frac{\alpha_0 - Y_t^n + \alpha_2 h_{t-2}}{\alpha_1} \tag{13}$$

The model shaped by the system of equations (11)-(5)-(6)-(13)-(8)-(12) is a synthesis of models (II) and (III): like in model (III) conditions in finance and credit markets amplify real shocks and can also trigger a boom/recession; in addition, like in model (II), long-run levels of output and employment are affected by the current state of effective demand (see Figure 4).[42] The second feature is what distinguishes it from the standard FAM frameworks. Yet, on closer inspection, the fact that the financial accelerator is none other than a way to introduce a long-lasting (though not ever-lasting) hysteresis of output in the basic NCM model is recognized, between the lines, by FAM proponents too. In the absence of information asymmetries – they argue – 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[11], p. 20). Notice that this entails that the main task of central banks is not the stabilization of inflation expectations, through the steering of the target interest rate, but the strengthening of firms' (and banks') balance-sheets, through the stabilization of financial asset (viz. collateral) markets. The point is that, while steering the interest rate, the central bank is in fact settling the solvability threshold of firms (and banks) operating in the system (see Brancaccio and Fontana 2012[14]). Interestingly enough, an unconventional stabilization policy has been pursued by Ben Bernanke since the beginning of his mandate as the Chair of the Federal Reserve, while the European Central Bank has been pursuing a much more conservative policy.[43] Whether such unconventional policy is linked or not to the unconventional framework (viz. the FAM model) developed by

[42]Notice that in equation (12) we have assumed that current net wealth of firms is equal to the stock of previous wealth augmented by a share of output gap, instead of total output.

[43]As has been observed, "EMU can be seen as a crucial example of the application of this 'new consensus' [in macroeconomics]" (Arestis and Sawyer 2013[7], Ch. 1, p. 11). In practice, although the 'two-pillar' model adopted by the ECB cannot be regarded as a pure 'inflation targeting' model, within the EMU "[m]onetary policy is tasked with the control of inflation, and fiscal policy is downgraded to at most the role of automatic stabiliser in the context of an overall balanced budget" (Arestis and Sawyer 2013[7], Ch. 2, p. 26).

Bernanke and its colleagues over the 1980s-1990s, is an interesting question. Unfortunately, as the European crisis proceeds, it becomes clearer and clearer that a pro-cyclical fiscal policy is also necessary to support employment and output. By contrast, NCM prescriptions, with the focus of monetary policy solely on inflation expectations, are "actually non optimal" (Arestis and Sawyer 2006[5], p. 859). An active fiscal policy, coupled with a direct intervention on the composition of output, are also necessary. In this regard, models (II), (III) and (IV), obtained through a simple amendment to the basic NCM model, give a further theoretical support to this Post Keynesian insight.

7 Final remarks

In the last two decades, a convergence of views in macroeconomics has seemed to emerge. Such a 'new consensus' has concerned both the academic modelling and the central-banking around the world. Yet, in spite of the new way of treating monetary policy, the NCM still shares a number of problematic theoretical features with Monetarism. Within the NCM, as in old monetarist approaches, expansionary fiscal policy has no lasting effect on real activity, while it leads to higher inflation and (nominal and real) interest rates in the long run. Furthermore, banks and financial markets are usually not included in the analysis, let alone modelled. Consequently, the two questions of the origin of financialization and of why today's economies are prone to financial instability and recurrent crises, remain unsolved. Against this background, in this paper we tried, first, to provide a critical analysis of the basic NCM model, by showing that it relies on the arguable assumptions that the natural level of output is exogenously-given and money is neutral in the long run. Second, we tried to argue that those assumptions come from a misunderstanding of the role played by banks and financial markets in capitalist economies. In addition, we provided an overview of a somewhat 'dissenter' branch of the NCM, viz. the FAM framework which has been mainly developed by Bernanke, Gertler and Gilchrist since the early 1980s. Differently from the basic NCM, FAM models explicitly aim to address the issue of the impact of changes in the financial structure on the real economy. Although the distance between FAM proponents and the Post Keynesians is still relevant, in both policy and the analysis of the circuit of monetary payments, we think that FAM works represent a step forward compared to the basic NCM model. Finally, we have shown that even a few adjustments in the NCM basic framework, aiming to account for both the hysteresis of output and the role of credit-money, are sufficient to make the model produce 'heterodox' results.

However, there have been some signs of a possible change in ECB's philosophy over the last few months.

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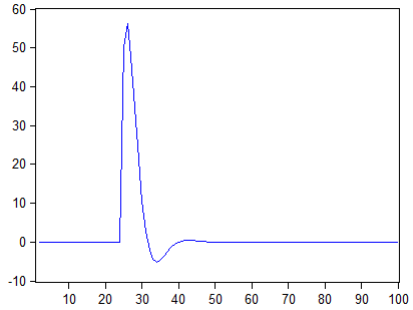
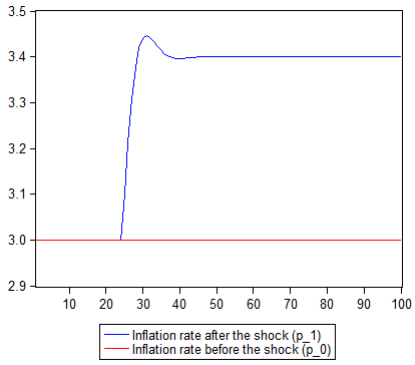
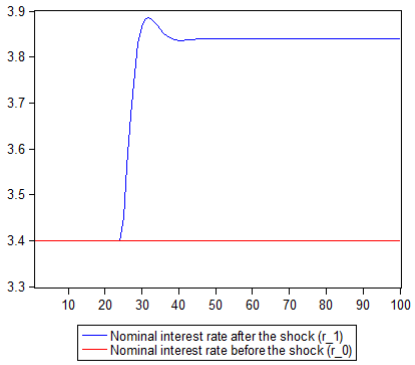
Figures



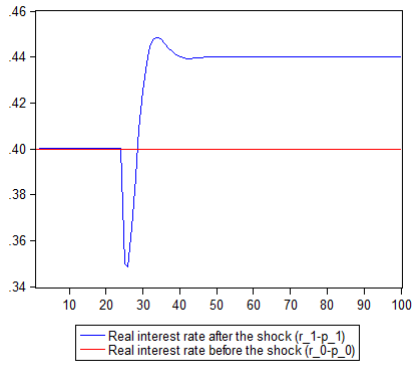
(a) *Impact on output gap.*



(b) *Impact on inflation rate.*



(c) *Impact on nominal interest rate.*



(d) *Impact on real interest rate.*

Figure 1: A simulation of the impact of an increase of government expenditure in the basic NCM model.

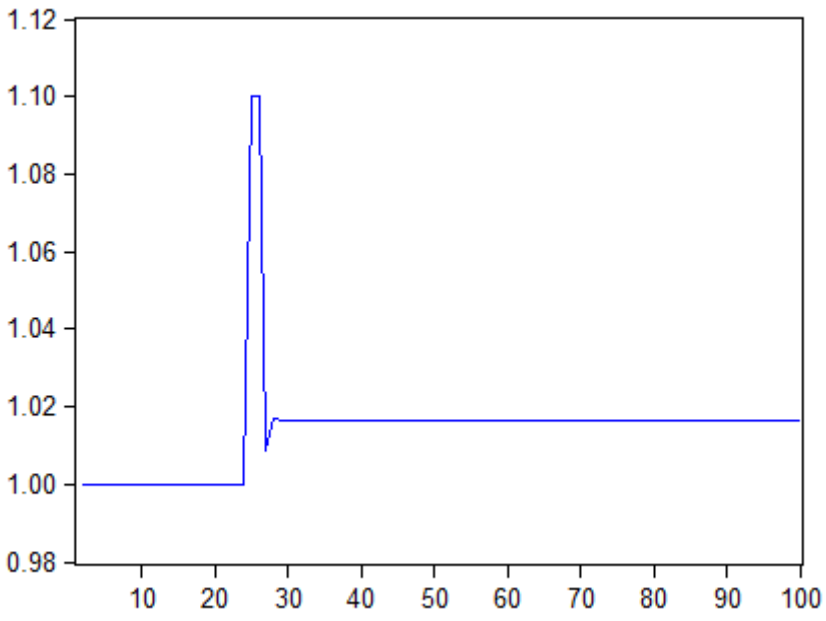


Figure 2: Impact of an increase of government expenditure on output in the amended NCM model (compared to baseline).

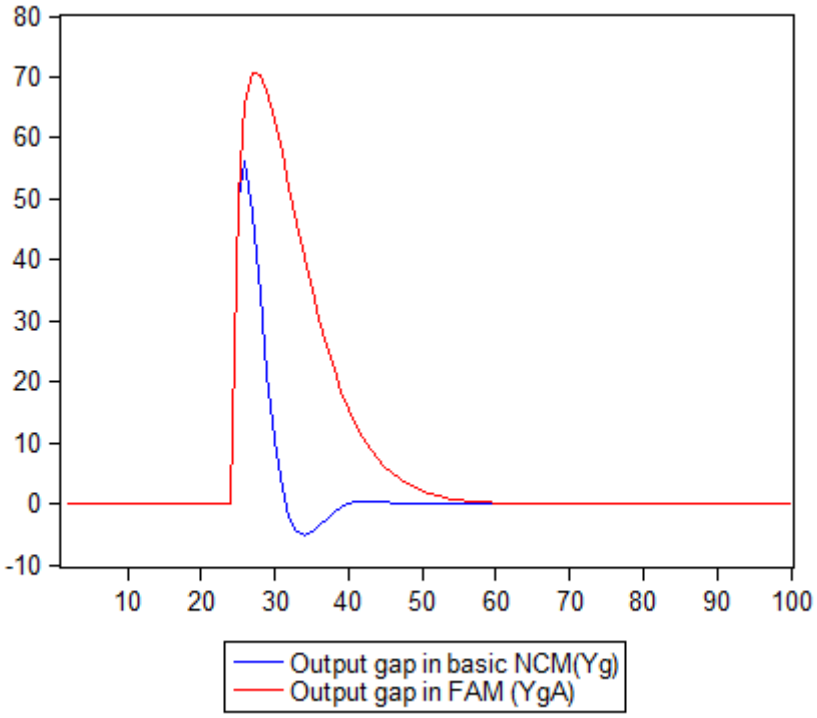


Figure 3: Impact of an increase of government expenditure on output gap: NCM model vs. FAM model.

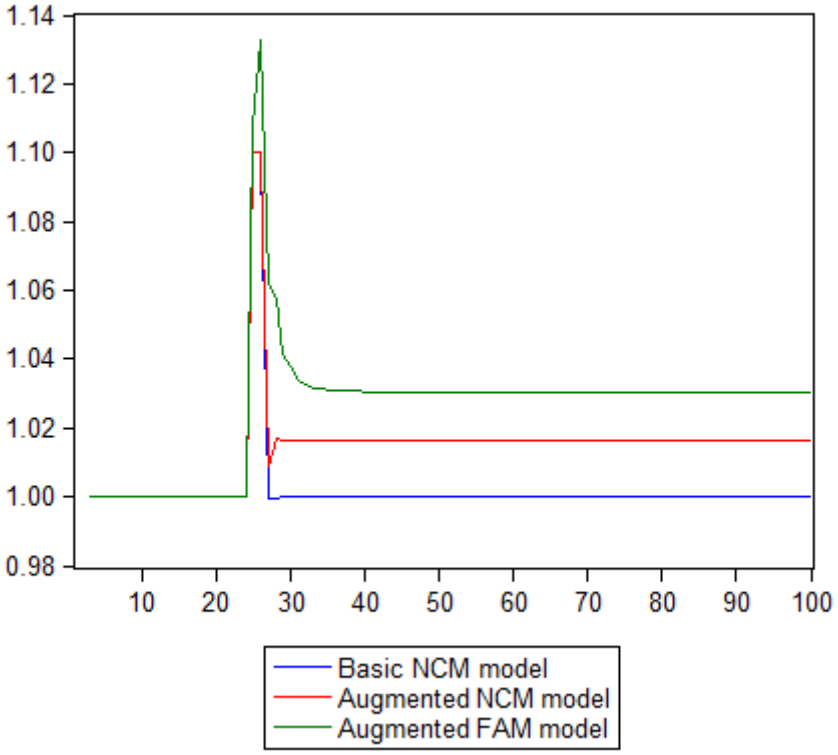


Figure 4: Impact of an increase of government expenditure on output gap: NCM, augmented FAM and augmented NCM.