Fontana, Giuseppe

Article

The 'New Consensus' View of Monetary Policy: A New Wicksellian Connection?

Intervention. Zeitschrift fuer Ökonomie / Journal of Economics

Provided in Cooperation with:
Edward Elgar Publishing

Suggested Citation: Fontana, Giuseppe (2006) : The 'New Consensus' View of Monetary Policy: A New Wicksellian Connection?, Intervention. Zeitschrift fuer Ökonomie / Journal of Economics, ISSN 2195-3376, Metropolis-Verlag, Marburg, Vol. 03, Iss. 2, pp. 263-278, https://doi.org/10.4337/ejeep.2006.02.10

This Version is available at:
https://hdl.handle.net/10419/277081

The ›New Consensus‹ View of Monetary Policy: A New Wicksellian Connection?

*Giuseppe Fontana**

One of the greatest achievements of the modern ›New Consensus‹ view in macroeconomics is the assertion of a non-quantity-theoretic approach to monetary policy. Leading theoricians and practitioners of this view have indeed rejected the quantity theory of money, and defended a return to the old Wicksellian idea of eliminating high levels of inflation by adjusting nominal interest rates to changes in the price level. This paper evaluates these recent developments in the theory and practice of monetary policy in terms of two basic questions, namely what is the monetary policy instrument controlled by the central bank, and which macroeconomic variables are affected in the short and long run by monetary policy.

JEL classifications: E5, E52
Keywords: Wicksell, monetary policy, New Consensus, endogenous money

1. Introduction

It is almost trivial to claim that interest rates play a key role in the theory and practice of modern monetary policy. Central banks around the world use interest rates in their dual roles of instrument variables in order to achieve their objectives and indicator variables to provide important information regarding the state of the economy. However, interest rates did not always enjoy such prominent roles in monetary policy. It is not long time ago that Lucas made a mockery of central bankers and theoretical scholars who suggested to control inflation through the use of interest rates (Lucas 1996). It is indeed one of

* University of Leeds (UK) and Università del Sannio, Benevento (Italy). The author is grateful to Philip Arestis, Eckhard Hein, Augusto Graziani, Marc Lavoie, Malcolm Sawyer, Achim Truger, and participants at the 9th Conference of the Research Network Alternative Macroeconomic Policies (Berlin, 28–29 October, 2005) for comments on an earlier draft of the paper. All remaining errors are mine.
Correspondence address:
Prof. Giuseppe Fontana, Leeds University Business School, University of Leeds, Leeds LS2 9JT, United Kingdom, e-mail: gf@lubs.leeds.ac.uk

Received 03 Jun 2006, accepted 10 Jul 2006

the greatest achievements of the modern ›New Consensus‹ view in macroeconomics to have defended a non-quantity-theoretic approach to monetary policy. Leading theoricians and practitioners of this view (e.g. Woodford 2003, Weber 2006) have maintained that the ›New Consensus‹ approach to monetary policy is a rejection of the quantity theory of money and a return to the old Wicksellian idea of eliminating high levels of inflation by adjusting nominal interest rates to changes in the price level.

The purpose of this paper is to evaluate these recent developments in the theory and practice of monetary policy in terms of two basic questions. Firstly, what is the monetary policy instrument controlled by the central bank? Secondly, which macroeconomic variables are affected in the short and in the long run by monetary policy?

The paper is organised as follows. Section 2 discusses the quantity theory of money and its policy implications for the short-run and long-run effects of monetary policy. Section 3 presents Wicksell's two interest rates analysis as a potentially non-quantity-theoretic approach to monetary policy. Section 4 focuses on the modern ›New Consensus‹ model and its relation to Wicksell's monetary analysis. Finally, section 5 concludes.

2. Quantity Theoretic Approaches to Monetary Policy

Hicks is often quoted for having claimed that monetary theory more than any other economic theory is ineluctably related to reality. By its own nature, monetary theory deals with, and evolves in response to, the historical evolution of actual economies (Hicks 1967: 156; also Fontana 2004a). From this, Hicks derives an important lesson for monetary theorists: changes in the level of output, employment or inflation are often the product of monetary factors. Yet, Hicks is aware that the realism of monetary theory still leaves economists with plenty of freedom in their analyses. In particular, monetary economists still have to make two essential choices for their theories, namely which monetary variable matters, and, what it matters for. In modern terms, the first choice relates to the control variable of the central bank, i.e. monetary aggregates or the short-run interest rate. The second choice refers to the nominal or real effects of monetary policy. Table 1 presents the two essential choices that, according to Hicks, economists have to face when discussing the cause and effects of monetary policy.

Table 1: Matrix of the Causes and Effects of Monetary Policy

	Monetary aggregates	Interest rate
Short run	Real effects (weak Classical tradition)	Real effects (New Consensus approach)
Long run	Nominal effects (strong Classical tradition)	Real effects (endogenous money approach)

The most popular position is labelled ›strong Classical‹ tradition in table 1. Ricardo and most of his classical contemporaries as well as many neoclassical economists had all sub-

scribed to the quantity theory of money and its axiom of neutrality of money. The control variable of the central bank is a monetary aggregate and the effects of monetary policy are only on the price level.

However, Hicks identifies also another quantity-theoretic monetary analysis, the so-called ›weak Classical‹ tradition in table 1. This tradition, which includes among others the essay *Of Money* by Hume (1963) and the works of Mill (1874) and Thornton (1802), distinguishes between short-run and long-run effects of changes in the money supply. In the short run, changes in the quantity of monetary aggregates do affect the level of output and employment in a country, though these real effects disappear in the long run when a new equilibrium point is achieved. In the long run, money and monetary policy only affect the price level. From this perspective, the weak Classical tradition sets aside the axiom of neutrality of money in the short run, only to assert it again in the long run. It is thus clear that the difference between the weak and strong versions of the Classical tradition is simply a question of accepting or not some temporary real effects of money changes in the short run. In the long run, banning hysteresis effects, which in any case are never mentioned by this literature, the weak and strong versions of the Classical tradition are simply equivalent.

Interestingly, the difference between the strong and weak version of the quantity-theoretic analysis is also the main topic of the Nobel Lecture *Monetary Neutrality* by Robert Lucas (1996). In the Lecture Lucas considers the tension between the long-run neutrality of money and the short-run real effects of changes in the money supply. Like Hicks, Lucas appears to locate the nature of this tension in the ineluctable realism of monetary theory. For instance, he refers with interest to the work of several economists, including Friedman and Schwartz (1963) and Sargent (1986), which have shown that changes in the money supply are often related to major business cycle fluctuations. From this perspective, according to Lucas, Milton Friedman is a modern follower of the weak version of the Classical tradition.

Starting with his famous *Restatement* in 1956, Friedman was in fact responsible for the remarkable revival of the quantity theory of money, at a time in which the Keynesian revolution had consigned it to oblivion. Like Hume, Milton Friedman maintained that the stock of money is (causally) neutral in the long run, but he conceded that changes in the money supply can have real effects in the short run, due to temporary elements of wage and price rigidity, and money illusion. For instance, workers may be slow to realise the implications of an unanticipated increase in the money supply. Given the adaptive expectation process that characterises wage negotiations in the labour market, this means that employment and output will temporarily increase. However, Friedman warned, once workers' expectations catch up with the increase in the money supply and the price level, these real effects of money changes will disappear.

A final point of Lucas in his Nobel Lecture is related to the conditions for assuring the long-run neutrality of money and monetary policy. The point is argued in two stages. Firstly, according to Lucas, there is no doubt that theoretical analyses of monetary policy should be conducted exclusively in terms of a path for the supply of money. For this reason,

he pours scorn on the idea suggested by central bankers and some monetary economists of using the interest rate to control inflation (Lucas 1996: 666). Monetary aggregates are, thus, the only theoretical variables that matter for discussing issues in monetary theory and policy. Secondly, against Tobin (1970) who argued that high correlation rates do not have any implication for the causality between inflation and monetary aggregates, Lucas interprets the strong correlation between money growth and inflation as a causal relationship. He refers with approval to the work of McCandless and Weber (1995), who examine data from 110 countries over a 30-year period. Depending on the definition of the money supply used, the authors find that the correlation between inflation and the growth rate of the money supply varies between 0.92 and 0.96.

In terms of table 1, Lucas (1996) defends a strong version of the Classical tradition. Monetary aggregates are the key theoretical variables controlled by the central bank, which is causally responsible only for changes in the price level. In other words, Lucas is a strong supporter of the axiom of neutrality of money in the long run. More importantly, Lucas maintains that this axiom is necessarily grounded in a quantity-theoretic monetary analysis, where monetary aggregates rather than the short-run interest rate are the control variable of the central bank. The next section will show that the modern mainstream approach to monetary policy, the so-called ›New Consensus‹ view, rejects the quantity-theoretic monetary framework defended by the weak and strong versions of the Classical tradition. This should not come as a surprise. Leading theorists and practitioners of the ›New Consensus‹ view, like Woodford (2003) and Weber (2006), have claimed the origin of the approach in the two interest rates analysis of Wicksell (1935 and 1936). Yet, the ›New Consensus‹ view strongly supports the axiom of neutrality of money in the long run, which, as argued in section 4, is not necessarily a feature of the Wicksellian analysis.

3. A Non-Quantity-Theoretic Approach to Monetary Policy: Wicksell's Two Interest Rates Analysis

Over the last two decades several economists have praised the convergent paths of the theory and practice of monetary policy (e.g. Goodhart 2001). More recently, Woodford (2003) has offered a systematic and rigorous representation of this ›New Consensus‹ view of monetary policy. Importantly, Woodford has also claimed that the ›New Consensus‹ view is a modern restatement and development of Wicksell's two interest rates analysis as famously set out by the Swedish author in *Interest and Prices* when discussing the case of a ›pure credit economy‹ (Wicksell 1936: ch. 9, sec. B).

There are at least two features of Wicksell's ›pure credit economy‹ which seem to have inspired Woodford and his colleagues. Firstly, the substitution of monetary aggregates with the short-run interest rate as the main control variable of the central bank. Secondly, the reversal of the causality implied by the quantity-theoretic monetary analysis, namely that changes in the price level cause changes in the money supply. In other words, for Woodford Wicksell is the economist, who more than everyone else has rejected the now discredited quantity-theoretic analysis of inflation in favour of an original two interest rates analysis

of it.[1] In terms of table 1 this means a move from column 1 to column 2. For this reason, Woodford builds on Wicksell's ›pure credit economy‹ in order to propose the model of a cashless and frictionless economy, the purpose being of presenting a core model for explaining the key features of modern monetary policy. Wicksell's ›pure credit economy‹ can be described by the following sequential process (Wicksell 1936: ch. 9, sec. B):

(a) Banks grant loans to entrepreneurs who use them to pay for the inputs, namely the wages of workers. Money has thus the nature of a debt/credit relationship with no intrinsic value.
(b) Workers have their wages credited to their bank deposits, which are then used to buy commodities from the merchant capitalists. These commodities represent the real savings of the merchant capitalists. In this process, thus, workers transform real savings (commodities) into money savings (bank deposits).
(c) In the final stage of the production process, the merchant capitalists use their money savings to buy the newly produced commodities from the entrepreneurs. As a result of this exchange, bank deposits of the merchant capitalists are transferred to entrepreneurs. Bank deposits are then employed by entrepreneurs for the repayment of loans to banks. If banks set an interest rate on loans equal to the real return on the production process, then investments are equal to savings, the economy is in equilibrium, and the marginalist rules of distribution are respected. At the end of the production process merchant capitalists receive the total amount of newly produced commodities net of the remunerations to the entrepreneurs, banks and workers for their contributions to the production process. Merchant capitalist receive the real return of the production process because of their initial savings of commodities.

According to Wicksell, this sequential process is instrumental to the idea of explaining the general movement of prices via the distinction between the natural real interest rate (ρ) and the loan interest rate (i).

The natural real interest rate is a pure commodity rate, and it is thus determined by the scarcity of saving (capital).[2] As Wicksell explains, ρ

> »is the rate of interest which would be determined by supply and demand if no use were made of money and all lending were effected in the form of real capital goods« (Wicksell 1936: 102).

The loan interest rate is the interest rate on bank loans, which is set by banks when granting credit to entrepreneurs. In equilibrium, banks set i equal to ρ. However, this equilibrium condition is only obtained by chance, the reason being that the loan rate is fixed in a discretionary way by banks. It is, thus, a controlled or contractual rate. By contrast,

1 See, however, Humphrey (2002) for a discussion of the arguments supporting a quantity-theoretic interpretation of Wicksell's monetary analysis.

2 See Seccareccia (2003) and Smithin (1994: ch. 3, 6) for a discussion of Wicksell's two interest rates analysis and its relation to Friedman's natural rate of unemployment analysis.

the natural real interest rate ρ is defined *in natura*, i.e. it is governed by the marginal productivity of capital. Importantly, ρ is not a constant, but changes as a result of movements of the variables affecting the marginal productivity of capital. The coincidence between i and ρ is thus accidental. Indeed, their difference is the main explanation for the change in the price level. In other words, and against the conclusions of the quantity-theoretic analysis of inflation, an inflationary (deflationary) process is triggered off whenever banks set the loan rate i lower (higher) than the exogenously shifting natural real interest rate ρ.

Wicksell's two interest rates analysis of inflation can be described as follows. When i is lower than ρ, entrepreneurs (i.e. investors) can now gain a positive (extra) profit at the expense of the merchant capitalists (i.e. savers). Therefore, entrepreneurs now borrow more credit from banks and increase investments. The opposite would occur if banks set i above ρ. Importantly, in either cases the level of (real) savings of the merchant capitalists has not changed. The difference between investments and savings is thus a positive function of the gap between the natural real interest rate ρ and the loan rate i:

$$(I - S) = \underset{+}{f}(\rho - i). \tag{1}$$

According to Wicksell, it is this difference between investments and savings which is the main cause of changes in the price level. For instance, when the loan rate i is set to a lower level than ρ, equation 1 explains that entrepreneurs increase investments via an increase in the demand for bank loans. Since in Wicksell's ›pure credit economy‹ banks can create *ex nihilo* credit in excess of merchant capitalists' real savings, banks accommodate the demand for loans of entrepreneurs. However, Wicksell assumes that the normal situation of the economy is characterised by full employment, with the result then that an increase in investment spending by entrepreneurs causes an increase in the price level P. In algebraic terms, this means that the inflation rate π is a function of the difference between investment and saving, and hence, through equation 1 above, of the gap between the natural real interest rate and the loan rate:

$$\pi = \frac{\Delta P}{P} = \underset{+}{g}(\rho - i). \tag{2}$$

There are several features of Wicksell's two interest rates analysis of inflation which are of interest to modern monetary economists (Tamborini 2006). First of all, money is an endogenous rather than an exogenous variable (Arestis / Sawyer 2006). This means that the stock of money in a country is not controlled by the central bank like in the strong and weak versions of the quantity-theoretic analysis or the textbook *IS-LM* model, but it is rather the natural outcome of the production process. Woodford (2003) champions the endogeneity hypothesis of the money supply process,[3] though he discusses it exclusively in terms of the reserve market. Modern central banks like the Bank of England and the

3 See Moore (1988) and Lavoie (1996) for a full statement of the endogenous money hypothesis and its policy implications.

U.S. Federal Reserve, Woodford argues, implement their interest rate target through a two-step procedure. Firstly, they set the short-run interest rate without any consideration of the size of open market operations, and then, and only then, they instruct the relevant financial departments to operate in the open market, namely buying or selling Treasury securities or equivalent such that to maintain the overnight interest rate near target (ibid.: 25 f.). By replacing a rule for base-money growth with an interest rate rule, modern central banks have thus vindicated Wicksell's monetary analysis. The stock of money in a country is the residual of the production process which is triggered off by the demand for loans of entrepreneurs. Here, nevertheless, there is an important difference with supporters of the ›New Consensus‹ view, who often conflate banks and the central bank in a generic banking system (Goodhart 2004). In his two interest rates analysis of inflation, Wicksell assumes that banks can create *ex nihilo* credit in excess of merchant capitalists' savings. In the production process, banks thus play an essential role in accommodating the investment plans of entrepreneurs. The endogeneity hypothesis of the money supply process is thus relevant not only for the analysis of the reserve market but also for the analysis of the credit market, where commercial banks and entrepreneurs negotiate the interest rate on loans (Lavoie 1992: ch. 4, Graziani 2003: ch. 4, Fontana 2004b).

A second feature of Wicksell's analysis which is of interest to modern monetary economists is the distinction between the equilibrium and disequilibrium conditions, where according to Wicksell the former is a special case of the latter. In the ›pure credit economy‹ described above, entrepreneurs are borrowers and commercial banks are lenders. In equilibrium, i.e. when banks set the loan rate i equal to the natural real interest rate ρ, via the credit supply process, banks simply transform the real savings of merchant capitalists in nominal savings, namely bank deposits, which are then used by entrepreneurs to repay their initial bank loans. However, commercial banks do not know ρ, since the marginal productivity of capital fluctuates over the business cycle. This means that when setting the loan rate they will be able to achieve the equilibrium condition only by pure chance. The normal case is, thus, an out-of-equilibrium situation where the gap between ρ and the loan rate produces an imbalance between investments and savings. Importantly, this imbalance is accommodated by commercial banks, which can change *ex nihilo* the supply of loans. From this perspective, it is the nature of modern monetary economies, where banks and credit play a key role in the production process, that is responsible for any inflationary or deflationary process. As explained by Wicksell (1936: 135 f.)

> »prices constitute […] a spiral spring which serves to transmit the power between the natural and the money rates of interest; but the spring must first be sufficiently stretched or compressed. In a pure cash economy, the spring is short and rigid; it becomes longer and more elastic in accordance with the stage of development of the system of credit and banking«.

Again, as before, it seems extraordinary that the ›New Consensus‹ view has rejected the quantity-theoretic analysis in favour of Wicksell's two interest rates analysis, and yet it has left behind an important feature of that analysis, namely the role of commercial banks

rather than simply central banks in the explanation of the production process, and related money supply process.[4] This is particularly curious because leading theorists and practitioners of the ›New Consensus‹ view like Weber (2006) and Woodford (2003) have recognised the originality of Wicksell's monetary analysis, and its rejection of both propositions of the strong and weak versions of the quantity-theoretic approaches to monetary policy, namely that (a) theoretical analyses of monetary policy should be conducted exclusively in terms of monetary aggregates, and (b) the correlation between monetary aggregates and inflation has to be interpreted in terms of a causal relationship. The next section will actually show that, against what leading theorists and practitioners of the ›New Consensus‹ view have claimed, the ›New Consensus‹ view has not fully embraced Wicksell's monetary analysis, and by doing it, it has missed potential venues for further developments of this non-quantity-theoretic approach to money and monetary policy.

4. The ›New Consensus‹ View of Monetary Policy

In the previous section, Wicksell's two interest rates analysis has been presented as an alternative framework to the strong and weak versions of the quantity-theoretic approaches to money and monetary policy discussed in section 1. Importantly, Wicksell's monetary analysis is now claimed to be the foundation for the current mainstream approach to money and monetary policy. Interestingly, the same has been claimed by a different group of economists, the Circuitists, and more generally the ›Endogenous Money‹ theorists (Fontana 2004a).[5] This section discusses these claims starting with an overview of the ›New Consensus‹ view of monetary policy.

Fontana / Palacio-Vera (2005) discuss at great length the so-called ›New Consensus‹ view in macroeconomics and its policy implications. Basically, the ›New Consensus‹ view endorses a modified version of the old neoclassical synthesis dichotomy between the real and the monetary sectors. The modification comes from the New Keynesian proposition, supported by a variety of micro-founded models, that nominal rigidities prevent wage and price clearing of the labour and goods markets more or less continuously. In other words, as argued by Tamborini (2006), New Keynesian scholars have accepted and built on the dynamic stochastic general equilibrium (DSGE) proposed by New Classical scholars in the 1970's and 1980's. This modern class of DSGE models are based on several classical assumptions including intertemporal optimisation, and the Ricardian Equivalence Theorem. Intertemporal optimisation of household is important to support the view that investments depend on the cost of capital alone, hence ruling out immediately any possibility for Keynesian animal spirits and hysteresis effects (Sawyer 2002). Similarly, the

4 For instance, there is no entry for ›banks‹ in the index of Woodford (2003).

5 See, for instance, Graziani who explicitly refers to Wicksell's ›pure credit economy‹ as the core model of the theory of the monetary circuit (Graziani 2003: 1 and 27, note 12). See, also, Bellofiore (2005) and Realfonzo (2006).

Ricardian Equivalence Theorem, namely the assumption that the method of financing any particular path of government expenditure is irrelevant, is essential to rule out fiscal policy. In these modern class of DSGE models all major classical features are confirmed. In particular, the potential level of output, the natural level of real wage, and the equilibrium real interest rate are determined only by technology and tastes, i.e. they are invariant to changes of monetary policy. The original contribution of New Keynesian scholars has thus been to introduce in these classical models some non-classical features such as to give some role to the Keynesian principle of effective demand, and hence some support to active stabilisation policies, especially in the form of monetary policy. The empirically grounded proposition that nominal rigidities prevent wage and price clearing of the labour and goods markets more or less continuously responds to this theoretical requirement. These nominal rigidities thus provide the rationale for Keynesian real effects of changes in nominal variables. However, once the nominal rigidities disappear, the real effects vanish altogether. In short, the ›New Consensus‹ view in macroeconomics implies that money and monetary policy only have real effects in the short run due to nominal rigidities, but they are neutral in the long run.

In its most basic form, the policy implications of the ›New Consensus‹ view in macroeconomics can be represented by three equations describing the dynamics of the interest rate, output and inflation.[6] The first equation deals with aggregate supply, the second with aggregate demand and the third indicates the monetary policy strategy:

$$\pi_t = g\left(y_t - \overline{y}_t, s_t\right), \tag{3}$$

$$y_t - \overline{y}_t = h\left(r_t, X_t, z_t\right), \tag{4}$$

$$r_t - \rho_t = f\left(\pi_t - \pi_t^*\right). \tag{5}$$

Equation 3 expresses current inflation (π_t) as a function of the output gap which is defined as the difference between actual output (y_t) and its potential level ($\overline{y}_t$). The error term (s_t) encapsulates any other factor affecting current inflation. Equation 4 is a ›new‹ *IS* curve relating the output gap to the short-run real interest rate (r), and a vector of variables (X) measuring movements in exogenous variables like government expenditure, tax structure, and net exports. The variable z_t is an error term. Finally, equation 5 shows a simple policy strategy for the central bank. The gap between the actual real interest rate r and its natural real interest rate level ρ is a function of the difference between current inflation π_t and the target inflation rate π^*.[7]

There are some important observations that can be derived from this simple set of equations representing the policy implications of the ›New Consensus‹ view. First of all,

6 The important role of lags and expectations are ignored in this basic representation of the ›New Consensus‹ view. See Woodford (2003) for a discussion of the role played by lags and expectations in modern monetary policy strategies.

7 See for a growth rate interpretation of equations 3 to 5 Fontana / Palacio-Vera (2005).

monetary aggregates do not appear in any equation. In particular, they do not appear in equation 5 which describes the policy strategy of the central bank. Consistency with the quantity theory of money would indeed require replacing equation 5 with an *LM* curve type of equation (Laidler 2002, Fontana / Palacio-Vera 2004):

$$\frac{M_t}{P_t} = m(\rho_t, y_t). \tag{6}$$

The key difference between equations 5 and equation 6 is related to Hicks's suggestion for discriminating between different approaches to monetary policy. According to the ›New Consensus‹ view, central banks set the shot-run nominal interest rate, but due to price and wage rigidities they are able to control the short-run real interest rate r, and hence to influence market interest rates. This means that modern central banks control the interest rate and not monetary aggregates. As in the case of Wicksell's monetary analysis, the ›New Consensus‹ view supports the endogenous money hypothesis rather than the exogenous money hypothesis of the strong and weak versions of the quantity-theoretic approach. Importantly, through their policy influence on market interest rates, central banks expect to be able to affect different components of aggregate demand (see equation 4), and hence to change the first item of the output gap $(y_t - \overline{y}_t)$, and thereby, via equation 3, to control the inflation rate π_t.

A second observation that can be derived from the ›New Consensus‹ equations above relates to the role of inflation and its relationship with monetary aggregates. From equation 5 it is clear that when the central bank sets the short-run real interest rate r at the level of its natural real interest rate level ρ, then current inflation π_t is at the target inflation rate π^*. Thus, the question is how the central bank is able to set r just at the natural real interest rate level. It is here that most of all the Wicksellian features of the ›New Consensus‹ come to the forefront: in Wicksell's two interest rates analysis, inflation is a summary statistics showing the state of imbalance of the economy. Wicksell's tenet is that the inflation responds to the same rules governing the price level in a single market. Just as a divergence between the demand for, and the supply of, a commodity causes a movement in the price of a particular commodity, then, Wicksell argues, any movement of the aggregate price level is in a similar way caused by a divergence between aggregate demand and aggregate supply. If this is the case, then the banking system does not need to ascertain the natural real interest rate before setting the loan rate. As long as the aggregate price level is constant, the banking system can be confident that the loan rate is matching the natural real interest rate, and it only needs to respond to movements in one direction or the other of the price level. In a similar fashion, the proponents of the ›New Consensus‹ view maintain that changes in the inflation rate are indicative of an imbalance in the economy, the level of aggregate demand being higher than the natural level of aggregate supply. This excessive level of aggregate demand puts pressure on the goods and labour markets with the result of an increase in the price and wage levels. Therefore, in the ›New Consensus‹ view, as long as the inflation rate is constant, central banks can be confident that the market rate is matching the natural real interest rate. It is only when the current inflation rate is

not constant that they have to engage in aggregate demand fine-tuning policy via changes in the short-run nominal interest rate.

Equations 3 to 5 describe the dynamics of inflation, output and interest rate when the current rate of inflation is not at its target level. In particular, equation 3 shows that the inflation rate increases when the current level of output y_t is greater than its natural or potential level $\overline{y}_t$. Equation 4, however, relates the difference between the current and potential levels of output, the so-called output gap to, among other things, the real interest rate r. More precisely, equation 4 relates the current component of the output gap to the real interest rate r. In other words, just like originally Wicksell did, proponents of the ›New Consensus‹ view maintain that the potential level of output $\overline{y}_t$ is not affected by aggregate demand, and hence does not respond to changes in the real interest rate r. If this is the case, the central bank simply needs to increase the short-term nominal interest rate when the inflation rate increases, and, given short-run price and wage sluggishness, the real interest rate r will also rise. As a result, aggregate demand will be negatively affected. The current level of output will thus decline and with it the current inflation rate. The process will stop when the central bank moves the real interest rate r to its natural real interest rate level ρ at which point the output gap is nil and the inflation rate will be constant at its target rate π^*. Similar conclusions follow in the case of a deflationary process.

However, there is a serious shortcoming with a similar adjustment mechanism, namely that it relies on the axiom of the long-run neutrality of money and monetary policy. Thus, from this perspective the ›New Consensus‹ view maintains the same policy conclusions as the strong and the weak Classical approaches, though via a theoretical framework which has replaced the monetary aggregates with the interest rate. Where the two classical approaches assumed that in no circumstances would monetary aggregates affect the long-run level of output and employment in a country, in a similar way the ›New Consensus‹ view maintains that the interest rate r never influences the potential level of output $\overline{y}_t$. In other words, proponents of the ›New Consensus‹ view hold that the real interest rate via changes in the aggregate demand only affects current output. By contrast, the aggregate supply which is exogenously determined by the level of capital, workforce and technology only affects the potential level of output. In terms of table 1, this means that the ›New Consensus‹ view only supports real effects of money and monetary policy in the short run.

Another way of explaining the ›New Consensus‹ support for the axiom of the long-run neutrality of money and monetary policy is to say that in mainstream monetary policy the short-run real interest rate r does not have any effect on its natural real interest rate level ρ. As long as the former is different from the latter, prices and wages are altered and, as a result of these changes, the short-run real interest rate r converges to its exogenously determined natural real interest rate level ρ. Interestingly, Wicksell himself seems to have maintained the assumption of independence between the loan rate i and the natural real interest rate level ρ, though in the Swedish edition of the *Lectures* (Wicksell 1935: 198 f.), he accepted, as a concession to his critics, the possibility of the interdependence between the two different interest rates. This possibility has been further explored by a follower of Wicksell, Erik Lindahl (1939), who has paid particular attention to the real effects of mon-

etary policy.[8] In Part II of his classic work *Studies* (ibid.), Lindahl argues that only under a very special assumption the natural real interest rate ρ can be conceived to be determined purely by technical conditions, namely the assumption of complete homogeneity of inputs and outputs. A possible illustration of this case would be an agricultural economy, where a scarce commodity is sown on free land with the help of free labour services (Lindahl 1939: 247). In the more general case of a monetary economy, the natural real interest rate ρ depends also on the price level and hence, via the effects on the costs and returns of economic activities, it cannot exist independently from the short-run real interest rate r:

> »The real interest factor [i.e. the natural real interest rate ρ, G.S.] in a certain period can be expressed as the relation between anticipated future product values and the values invested during the period. The prices of invested services are, however, influenced by the demands of entrepreneurs, and these in turns are influenced by the loan rate of interest itself [i.e. the short-run real interest rate r, G.S.]. […] We accordingly find that the real interest rate on capital, as here defined, has a tendency to adjust itself to the actual loan rate of interest in every period« (Lindahl 1939: 248 f.).

Lindahl offers an exemplification of the convergence of the natural real interest rate ρ toward the short-run real interest rate r, when discussing the cumulative inflationary (deflationary) process caused by lowering (raising) the short-run real interest rate r (Lindahl 1939: ch. 2). As indicated in equation 1, a fall in r leads to an excess of investments over savings, and the subsequent increase in the price level (equation 2) implies higher incomes to entrepreneurs. These windfall profits woud replenish the level of savings and hence adjust them to the higher credit-driven level of investments. This amounts to say that through the inflation process the redistribution of real income from wage workers to entrepreneurs causes the natural real interest rate ρ to converge toward the lower level of the short-run real interest rate r.[9]

The assumption of an interdependence between the short-run real interest rate r and its natural real interest rate ρ has been further developed by another group of modern monetary economists who have claimed Wicksell's analysis to be the foundation of their non-quantity-theoretic approach to money and monetary policy, namely the ›Endogenous Money‹ view (Fontana 2004a). In this alternative interpretation of Wicksell's two interest rate analysis the interdependence between the short-run real interest rate r and the natural real interest rate level ρ is discussed in terms of the effects of r, via changes in the aggre-

8 See Costabile (2005) for an analysis of the interplay between analytical and ideological ideas in the elaboration of different theories of money and monetary policy. She argues that the pre-analytical view of economists is at least as important as their theoretical models in explaining their support for or rejection of the axiom of long-run neutrality of monetary policy.

9 For a general discussion of Lindahl's analysis of the cumulative inflationary (deflationary) process caused by lowering (raising) the level of short-run real interest rate r, under different assumptions about the level of employment of input and price expectations, and its modern relevance for the ›New Consensus‹ view, see Boianovsky / Trautwein (2006a and 2006b).

gate demand, on both components of the output gap of equation 3, namely current and potential levels of output.

Like for the ›New Consensus‹ view, supporters of the ›Endogenous Money‹ interpretation of Wicksell's monetary analysis reject both main propositions of the strong and weak versions of the quantity-theoretic approaches to monetary policy, namely that (a) theoretical analyses of monetary policy should be conducted exclusively in terms of monetary aggregates, and (b) the correlation between monetary aggregates and inflation has to be interpreted in terms of a causal relationship from the former to the latter. However, in contrast to the ›New Consensus‹ view, they maintain that there is now a large literature suggesting that persistent but nevertheless transitory changes in aggregate demand, due to changes in the interest rate controlled by the central bank, may have permanent effects on current and potential levels of output and hence on the natural real interest rate ρ. If this is the case, it cannot be excluded that monetary policy has long-run effects on output and employment. Therefore, the axiom of neutrality of money and monetary policy is untenable either in the short run and the long run. In terms of table 1, thus, the ›Endogenous Money‹ view holds that the control variable of central banks is the interest rate and that by changing this variable central banks can produce short-run and long-run real effects in the economy.

These long-run effects of aggregate demand are usually discussed in the ›Endogenous Money‹ view under two headings, namely demand-led growth models and hysteresis models (Fontana / Palacio-Vera 2005). Demand-led growth models show that by acting upon the supply of labour, the availability of capital, and the level of technology in the economy, aggregate demand can alter the potential levels of output and employment in a country. Aggregate demand also plays a significant long-run role in hysteresis models through two complementary theoretical hypotheses, namely the ›labour market phenomena‹ hypothesis (Ball 1999) and the ›capital shortage‹ hypothesis (Arestis / Biefang-Frisancho Mariscal 1998 and 2000). Basically, these models show that by curbing aggregate demand, central banks may permanently influence the labour market (e.g., via depreciation of skills and loss of work motivation in unemployed individuals) and the capital market (e.g., via lower level of investment and hence lower capital stock). As a result of these changes, when aggregate demand finally returns to its original level, the supply of labour and of capital does not bounce back (Sawyer 2002).

5. Concluding Remarks

Modern mainstream economists have abandoned the quantity-theoretic approach to money and monetary policy in favour of the old Wicksellian idea of eliminating high levels of inflation by adjusting nominal interest rates to changes in the price level. This paper has evaluated these recent developments in terms of two basic questions, namely what is the monetary policy instrument controlled by the central bank, and which macroeconomic variables are affected in the short and long run by monetary policy.

There is no doubt that the ›New Consensus‹ approach to monetary policy has made highly important contributions to the modern theory and practice of monetary policy. To start with, the ›New Consensus‹ approach to monetary policy has rejected the two fundamental and yet most untenable propositions of the classical theory of money, namely that central banks control monetary aggregates rather than interest rates, and that by doing this, they can control the price level. More importantly, the ›New Consensus‹ approach to monetary policy has replaced this quantity-theoretic approach to monetary policy with a non-quantity-theoretic approach, namely Wicksell's two interest rates analysis. In this alternative approach, the supply of money is not controlled by the central bank, but it is rather the natural outcome of the economic process. In other words, money is endogenous, not exogenous. In addition, once the endogeneity of money is acknowledged, then it naturally follows that the relationship between the short-run real interest rate r and the natural real interest rate ρ becomes prominent in the explanation of changes in the price level and the levels of output and employment over the business cycle. Unfortunately, on this point the ›New Consensus‹ approach to monetary policy has failed to achieve the full potential of the Wicksellian monetary analysis. By assuming independence of the natural real interest rate ρ from the short-run real interest rate r, leading theorist and practitioners of the ›New Consensus‹ view have gone back to the most influential conclusion of the classical theory of money, namely that monetary policy is neutral in the long run. This paper has argued that this represents the main limitation and possibly the most important challenge for the future development of the modern mainstream approach to money and monetary policy.

References

Arestis, Philip / Biefang-Frisancho Mariscal, Iris (1998): Capital Shortages and Asymmetries in UK Unemployment, in: Structural Change and Economic Dynamics, Vol. 9, No. 2, pp. 189–204

Arestis, Philip / Biefang-Frisancho Mariscal, Iris (2000): Capital Shortages, Unemployment and Wages in the UK and Germany, in: Scottish Journal of Political Economy, Vol. 47, No. 5, pp. 487–503

Arestis, Philip / Sawyer, Malcolm C. (2006): The Nature and Role of Monetary Policy when Money is Endogenous, in: Cambridge Journal of Economics, forthcoming

Ball, Laurence (1999): Aggregate Demand and Long-Run Unemployment, in: Brookings Papers on Economic Activity, Vol. 2, pp. 189–236

Bellofiore, Riccardo (2005): Monetary Economics after Wicksell: Alternative Perspectives within the Theory of the Monetary Circuit, in: Fontana, Giuseppe / Realfonzo, Riccardo (eds.), The Monetary Theory of Production: Tradition and Perspectives, London: Palgrave Macmillan, pp. 39–51

Boianovsky, Mauro / Trautwein, Hans-Michael (2006a): Wicksell after Woodford, in: Journal of the History of Economic Thought, Vol. 28, No. 2, pp. 171–185

Boianovsky, Mauro / Trautwein, Hans-Michael (2006b): Price Expectations, Capital Accumulation and Employment: Lindahl's Macroeconomics from the 1920s to the 1950s, in: Cambridge Journal of Economics, forthcoming

Costabile, Lilia (2005): Money, Cycles and Capital Formation: Von Mises the ›Austrian‹ vs. Robertson the ›Dynamist‹, in: Cambridge Journal of Economics, Vol. 29, No. 5, pp. 685–707

Fontana, Giuseppe (2004a): Hicks on Monetary Theory and History: Money as Endogenous Money, in: Cambridge Journal of Economics, Vol. 28, No. 1, pp. 73–88

Fontana, Giuseppe (2004b): Rethinking Endogenous Money: A Constructive Interpretation of the Debate between Accommodationists and Structuralists, in: Metroeconomica, Vol. 55, No. 4, pp. 367–385

Fontana, Giuseppe / Palacio-Vera, Alfonso (2004): Monetary Policy Uncovered: Theory and Practice, in: International Review of Applied Economics, Vol. 18, No. 1, pp. 25–42

Fontana, Giuseppe / Palacio-Vera, Alfonso (2005): Are Long-run Price Stability and Short-run Output Stabilization all that Monetary Policy can Aim for?, in: Levy Economics Institute, Working Paper, No. 430

Friedman, Milton (1956): The Quantity Theory of Money: A Restatement, in: Friedman, Milton (ed.), Studies in the Quantity Theory of Money, Chicago: University of Chicago Press, pp. 3–21

Friedman, Milton / Schwartz, Anna J. (1963): A Monetary History of the United States, 1867 to 1960, Princeton: Princeton University Press

Goodhart, Charles A. E. (2001): The Endogeneity of Money, in: Arestis, Philip / Desai, Meghnad / Dow, Sheila (eds.), Money, Macroeconomics and Keynes, Essays in Honour of Victoria Chick, Vol. 1, London: Routledge, pp. 14–24

Goodhart, Charles A. E. (2004): Review of Interest and Prices by M. Woodford, in: Journal of Economics, Vol. 82, No. 2, pp. 195–200

Graziani, Augusto (2003): The Monetary Theory of Production, Cambridge (UK): Cambridge University Press

Hicks, John (1967): Monetary Theory and History: An Attempt at Perspective, in: Hicks, John, Critical Essays in Monetary Theory, Oxford: Clarendon Press, pp. 155–173

Hume, David (1963 [1752]): Of Money, in: Hume, David, Essays, Moral, Political and Literary, Oxford: Oxford University Press, pp. 289–302

Humphrey, Thomas M. (2002): Knut Wicksell and Gustav Cassel on the Cumulative Process and the Price-Stabilizing Policy Rule, in: Federal Reserve Bank of Richmond Economic Quarterly, Vol. 88, No. 3, pp. 59–83

Laidler, David (2002): The Transmission Mechanism with Endogenous Money, in: Arestis, Philip / Desai, Meghnad / Dow, Sheila (eds), Money, Macroeconomics and Keynes, London: Routledge, pp. 25–34

Lavoie, Marc (1992): Foundations of Post-Keynesian Economic Analysis, Aldershot (UK): Edward Elgar

Lavoie, Marc (1996): Monetary Policy in an Economy with Endogenous Credit Money, in: Deleplace, Ghislain / Nell, Edward J.(eds.), Money in Motion: The Post Keynesian and Circulation Approaches, London: Macmillan, pp. 532–545

Lindahl, Erik (1939): Studies in the Theory of Money and Capital, London: George Allen and Unwin

Lucas, Robert E. Jr. (1996): Monetary Neutrality (Nobel Lecture), in: Journal of Political Economy, Vol. 104, No. 4, pp. 661–682

McCandless, George T. Jr. / Weber, Warren E. (1995): Some Monetary Facts, in: Federal Reserve Bank of Minneapolis Quarterly Review, Vol. 19, No. 3, pp. 2–11

Mill, John Stuart (1874): Influence of Consumption upon Production, in: Mill, John Stuart, Essays on Unsettled Questions of Political Economy, London: Longmans & Co., pp. 47–74

Moore, Basil J. (1988): Horizontalists and Verticalists: The Macroeconomics of Credit Money, Cambridge (UK): Cambridge University Press

Realfonzo, Riccardo (2006): Italian Circuitist Approach, in: Arestis, Philip / Sawyer, Malcom C. (eds.), The Handbook of Alternative Monetary Economics, Cheltenham (UK): Edward Elgar, forthcoming

Sargent, Thomas J. (1986): The Ends of Four Big Inflations, in: Sargent, Thomas J. (ed.), Rational Expectations and Inflation, New York: Harper and Row, pp. 40–109

Sawyer, Malcolm C. (2002): The NAIRU, Aggregate Demand and Investment, in: Metroeconomica, Vol. 53, No. 1, pp. 66–94

Seccareccia, Mario (2003): Wicksellian Norm, Central Bank Real Interest Rate Targeting and Macroeconomic Performance, in: Arestis, Philip / Sawyer, Malcolm C. (eds.), The Political Economy of Central Banking, Cheltenham (UK): Edward Elgar, pp. 180–98

Smithin, John (1994): Controversies in Monetary Economics: Ideas, Issues and Policy, Aldershot (UK): Edward Elgar

Tamborini, Roberto (2006): Back to Wicksell? In Search of the Foundations of Practical Monetary Policy, forthcoming

Tobin, James (1970): Money and Income: Post Hoc Ergo Propter Hoc?, in: Quarterly Journal of Economics, Vol. 84, No. 2, pp. 301–317

Thornton, Henry (1802): An Inquiry into the Nature and Effects of the Paper Credit of Great Britain, edited by Friedrich August von Hayek (1962), New York: Augustus M. Kelley

Weber, Axel A. (2006): The Role of Interest Rates in Theory and Practice: How Useful Is the Concept of the Natural Real Rate of Interest for Monetary Policy?, Inaugural G. L. S. Shackle Biennial Memorial Lecture, St. Edmund's College, Cambridge

Wicksell, Knut (1935 [1906]): Lectures on Political Economy, Vol. II: Money, London: Routledge and Kegan Paul. Translation of the 3rd Swedish edition of 1929, Föreläsningar i nationalekonomi Häft II: Om penningar och kredit, Stockholm, Lund: Fritzes, Berlingska, translated by E. Classen (ed. Lionel Robbins)

Wicksell, Knut (1936 [1898]): Interest and Prices: A Study of the Causes Regulating the Value of Money, London: Macmillan. Translation of the 1st German edition of 1898, Geldzins und Güterpreise, Eine Studie über die den Tauschwert des Geldes bestimmenden Ursachen, Jena: G. Fischer, translated by Richard F. Kahn

Woodford, Michael (2003): Interest and Prices: Foundations of a Theory of Monetary Policy, Princeton University Press, Princeton