The Role of Money and Interest Rates in the Theory of Monetary Policy: An Attempt at Perspective*

Abstract: The purpose of this paper is to evaluate the recent developments in the theory and practice of monetary policy, drawing on the work of influential monetary economists of the past.

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Once, a central bank who did not believe in monetarism would have been viewed as equivalent to a priest who admits being atheist.  
(The Economists, 2006, p. 10)

1 Introduction

The last two decades have seen a blossoming of seminars, conferences and related publications in academic and non-academic outlets, firstly announcing, and then celebrating, the remarkable achievements of a “New Consensus” between theorists and practitioners of monetary policy. For instance, Goodhart has contended that “the yawning chasm between what theorists suggested that central banks should do, and what those same central banks felt it right to do has largely now closed” (Goodhart 2001, p. 21). In effect, it cannot be denied that important developments have recently taken place in the theory as well as in the practice of monetary policy. Central banks have replaced the monetarist prescription for a strict control of monetary aggregates with the New Keynesian recommendation for the management of key interest rates. More precisely, today central banks around the world engage in aggregate demand fine-tuning, via changes in the short-term nominal interest rate with the implicit or explicit purpose of hitting a desired level of inflation. This policy strategy has been presented as a rigorous development of Wicksell’s two-interest rate analysis (e.g. Woodford 2003, Weber 2006). The purpose of this paper is to evaluate these recent developments in the theory and practice of monetary policy drawing on the works of influential monetary economists over the previous centuries.¹

¹ The paper is organized as follows. Section 2 discusses the Classical approach to monetary policy drawing on Hick’s distinction between a strong and a weak version of
the quantity theory of money. Section 3 examines an alternative approach to monetary policy, namely Wicksell’s two-interest rate analysis, and its policy implications. Section 4 discusses the modern approach to monetary policy, the so-called “New Consensus” view, which has been presented as the new rigorous development of Wicksell’s analysis. Finally, Section 5 concludes.

2 Classical Approaches to Money and Monetary Policy

It is now almost forty years that in the Edward Shann lecture in Perth (Australia) Hicks spoke of the ineluctable realism of monetary theory. “Monetary theory … cannot avoid a relation to reality, which in other economic theory is sometimes missing” (Hicks 1967, p. 156). In other words, by its own nature, monetary theory deals with, and evolves in response to, the historical evolution of actual economies. From this perspective, Hicks was confident that one of the major historical lessons for monetary theorists is that recessions and booms are often related to monetary changes. More precisely, monetary theorists cannot ignore that fluctuations in the level of output, employment or inflation are often the product of monetary factors. Notwithstanding the realistic nature of monetary theory, Hicks argues that monetary economists need to make two essential theoretical choices when explaining historical monetary events, namely which monetary variable matters, and what it matters for. In modern terms, the first choice relates to the operating procedures of monetary policy. Putting it simply, does the central bank control monetary aggregates or interest rates? The second choice refers to the policy goals of the central bank, together with the time period considered, namely the short run or the long run. The policy goals of the central bank are various, and change over time, including for
instance high employment, economic growth, price stability, interest rate stability, stability of financial markets, and stability of foreign exchange markets. More generally, when discussing of the policy goals of the central bank, economists discriminate between real and nominal effects of monetary policy.

The major purpose of Hicks’s Shann lecture is indeed to discuss, over a period of circa 200 years, what type of choices leading monetary economists and practitioners have made, and for what reason. The starting point of the Hicks is the controversial issue of the relationship between Keynes and the “Classics”. Basically, Keynes used the term “Classics” to indicate the work of Ricardo and his contemporaries (the Classical economists), as well as the work of late 19th century economists (the Neo-classical economists). For this reason, Keynes was thus exposed to the accusation of conflating different economic traditions, which had very little in common. Hicks challenges this view by showing that despite the historical inaccuracy, Keynes quite rightly perceived a common feature in the works of the so-called “Classics”. Ricardo and most of his classical contemporaries, as well as many neoclassical economists had all subscribed to the axiom of neutrality of money. Changes in the quantity of monetary aggregates do not have real effects, i.e. money does not have any influence on the level of output and employment in a country. Changes in the quantity of monetary aggregates only affect nominal variables. At the same time, Hicks points up that there was another form of the “Classic” tradition stretching back to the essay “Of Money” by David Hume in 1750, and which also included some of the works of Thornton (1802) and Mill (1874), which showed the real effects of money and monetary policy.

Notwithstanding this conclusion [i.e. the long-run neutrality of money changes], which must be allowed just, it is certain that since the discovery of the mines in
America, industry has increased in all the nations of Europe. … Accordingly we find that in every kingdom, into which money begins to flow in greater abundance than formerly, everything takes on a new face; labour and industry gain life; the merchant becomes more enterprising, and even the farmer follows his plough with greater alacrity and attention. … In my opinion, it is only in this interval or intermediate situation, between the acquisition of money and the rise of prices, that the increasing quantity of gold and silver is favourable to industry (Hume 1750, pp. 293-294).

In order to separate this approach from the traditional “Classics”, this paper maintains Hicks’s distinction between a strong and weak version of the “Classic” tradition (S-Classics and W-Classics thereafter, respectively). The strong version of the “Classic” tradition (S-Classics), which include the works of Ricardo and many neoclassical defenders of the axiom of neutrality of money maintain that the central bank targets monetary aggregates for the exclusive purpose of controlling the price level. Monetary policy thus does not have real effects, but only nominal effects.

The weak version of the “Classic” tradition (W-Classics) maintains that monetary policy has important effects on the level of employment and output, though these real effects are only confined to the short run, i.e. to the time interval before a new long-run equilibrium point is achieved after a monetary shock. In other words, the monetary variable that is controlled by the central bank is still the quantity of money but, differently from the strong version of the “Classics”, money now matters for the cyclical fluctuations in the level of output and employment. For the sake of historical accuracy, it should be also said that before the monetarist era, this weak version of the “Classics” tradition did not achieve the theoretical rigour or the public fame of the strong version of the “Classics” tradition. Schumpeter makes the interesting suggestion that leading W-Classics economists like Thornton and Mill actually made their original monetary
contributions starting from the “Classics” monetary framework of Ricardo. For this reason, Schumpeter argues that Thornton and Mill, and most of their modern successors were never able to free their work from the stringent conclusions of Ricardo’s theory of money, and by doing it they held back progress in monetary theory and policy for several decades (Schumpeter 1954, pp. 717-725).

Interestingly, the controversy between the S-Classics and the W-Classics traditions over the effects of money changes is also the main topic of the Nobel lecture “Monetary Neutrality” by Robert Lucas. In the Nobel lecture, Lucas discusses at great length of the “tension between two incompatible ideas – that changes in money are neutral units changes, and that they induce movements in employment and production in the same direction” (Lucas 1996, p. 664). Lucas himself identifies the beginning of this tension in the work of Hume quoted above. Like Hicks, Lucas also seems to concede that this tension between long-run nominal effects and short-run real effects of money changes derives from the ineluctable realism of monetary theory. For instance, he refers to the work of several economists including Friedman and Schwartz (1963) and Sargent (1986), which have shown that money changes are related to major business cycle fluctuations. Thus, money changes do matter for explaining short-run output fluctuations. For this reason, Lucas is not embarrassed of relaxing the axiom of neutrality of money and monetary policy for the purpose of short-run monetary analyses.

After reviewing recent theoretical and empirical evidence, Lucas argues that in order to explain the short-run real effects of monetary policy, the distinction between anticipated and unanticipated changes in the quantity of money must be acknowledged. Anticipated changes do not bring about any of the employment and output effects
described by Hume. By contrast, unanticipated monetary expansion can stimulate production and employment. Similarly, unanticipated contractions can induce depression. These conclusions reinforce, of course, the early monetarist analysis and empirical work of Milton Friedman and his followers. Starting with his famous “Restatement”, Friedman (1956) 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, Friedman maintained that the stock of money is (causally) neutral in the long run, but he acknowledged that changes in the money supply can have real effects in the short run, due to temporary wage and price rigidities, and money illusion. For instance, workers may be slow to realize 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, then, these real effects of money changes will disappear. It is also noteworthy to add that in the final part of his Nobel lecture, Lucas confesses that he has now no much faith in the distinction between anticipated and unanticipated changes, and he suggests that a sound understanding of the effects of monetary policy may lie in real business cycle models à la Kydland and Prescott, suitably amended with some monetary features.

Whatever the merits of Lucas’s suggestion for future research are, a critical point of his Nobel lecture is that the axiom of the long-run neutrality of money and monetary policy critically rests on the issue of how monetary changes are brought into effect. 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 the effects of changes in monetary aggregates. For this reason, he pours scorn on the idea suggested by central bankers and some monetary economists of using interest rate to control inflation (Lucas 1996, p. 666). The quantity of money is thus the only theoretical variable that matters for discussing issues in monetary theory and policy. Secondly, 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 examines data from 110 countries over a 30-year period. Depending on the definition of the money supply used, these authors find that the correlation between inflation and the growth rate of the money supply varies between 0.92 and 0.96. On the basis of this type of empirical results, Lucas then concludes that the quantity of money is the theoretical variable that matters for discussing issues in monetary theory and policy and, more importantly, it only matters for explaining changes in the price level. From this perspective, Lucas is then a strong representative of the S-Classics tradition.

Before moving to the discussion of the modern theory and practice of monetary policy, it is noteworthy to recall the main points of Hick’s Shann lecture. The ineluctable realism of monetary theory means that economists have to confront the effects, sometimes dramatic effects of monetary disturbances. Classical economists have basically oscillated between a strong and a weak application of the quantity theory of money. In the case of a strong application of the quantity theory of money (S-Classics), real effects of changes in monetary aggregates are always excluded. Some these real effects are by contrast acknowledged by defendants of the weak application of the quantity theory of money (W-Classics). However, these real effects are only confined to
the short run, i.e. to the time interval before a new long-run equilibrium point is achieved.\(^4\) Thus, both the “W-Classics” and the “S-Classics” approaches to monetary policy subscribe to the axiom of long-run neutrality of money and monetary policy. Importantly, as explained by Lucas in his Nobel lecture, this axiom relies upon two rather controversial propositions. Firstly, theoretical analyses of monetary policy should be conducted exclusively in terms of the effects of changes in monetary aggregates. Secondly, the often quoted strong correlation between changes of monetary aggregates and inflation has to be interpreted in terms of a causal relationship.

Section 4 below shows that the modern approach to monetary policy, the so-called “New Consensus” view rejects both propositions. 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 Knut Wicksell. Therefore, before discussing the “New Consensus” view, next Section discusses Wicksell’s analysis and assesses the claim that it represents a non-Classical approach to money and monetary policy.

3 A Non-Classical Approach to Money and Monetary Policy: Wicksell’s “Pure Credit Economy”

In his celebrated masterpiece, Woodford (2003) complains that one of the most difficult tasks for economists in the past few decades has been to reconcile the practitioners’ understanding of monetary policy with the way monetary policy was usually modelled in theoretical and empirical economics. In terms of Hicks’s analysis, Woodford complains that monetary policy had always been couched by references to
changes in monetary aggregates. Following the modern practice of most central bankers around the world, Woodford encourages the academic profession to abandon the quantity theoretic approach in favour of interest rate management policy strategies:

An argument that is sometimes advanced for specifying monetary policy in terms of a rule for base-money growth rather than an interest-rate rule is that central banks do not actually fix overnight interest rate. Even when banks have an operating target for the overnight rate, they typically seek to implement it through open-market operations in Treasury securities or their equivalent. … But even when banks implement their interest-rate targets entirely through quantity adjustments … this conclusion hardly follows. Central banks like the U.S. Federal Reserve determine their quantity adjustments through a two-step procedure: first the interest-rate target is determined by a monetary policy committee without consideration of the size of the implied open-market operations, and then the appropriate daily open-market operations required to maintain the funds rate near the target are determined by people closer to the financial markets (Woodford 2003, pp. 25-26).

Woodford claims as his source of inspiration the work of Wicksell to the point that he adopts for his work the same title of the *magnum opus* of the Swedish economist, *Interest and Prices* (Wicksell 1936; Woodford 2003, pp. xiii-xiv). More importantly, Woodford recognises that the core model for understanding modern monetary economies is Wicksell’s “pure credit economy” (Woodford 2003, p. 32).

For the purpose of this paper, there are two key features of Wicksell’s “pure credit economy” worthy to recall. Firstly, the replacement of monetary aggregates with interest rates as the main control variables of the central bank. Secondly, the reversal of the causality implied by the quantity theory of money, namely changes in the price level cause changes in the money supply. Wicksell’s “pure credit economy” can be described by the following sequential process (Wicksell 1936, Ch. 9, Sec. B):

(a) The banking system grants credit in the form of loans to entrepreneurs, which use them to pay for the inputs, namely the wages of workers.⁵
Money has thus the nature of a debit/credit relationship with no intrinsic value.

(b) Workers use their wages in the forms of bank deposits to buy commodities, which are provided by the merchant capitalists. These commodities represent the real savings of the merchant capitalists. In this way, workers transform real savings (commodities) into monetary savings (bank deposits).

(c) At the end of the production process, merchant capitalists use their monetary savings to buy newly produced commodities from entrepreneurs. This means that merchant capitalists transfer bank deposits to entrepreneurs in exchange for commodities. Entrepreneurs can then use these bank deposits to repay the banking system for their initial borrowings. If banks set an interest rate on loans equal to the real return on the production process, then investment is 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 entrepreneurs, banks, and workers for their contributions to the production process. Of course, merchant capitalists receive the real return of the production process because they are the owners of real savings.

According to Wicksell, this sequential process is instrumental to the idea of explaining the general movement of prices, via the distinction between the natural
interest rate (NRI or \( \rho \)), and the loan interest rate (\( r \)). Thus, despite the fact that several features of Wicksell’s “pure credit economy” transcend the original purpose of the analysis,\(^6\) the description of the sequential process in this section is consistent with Wicksell’s approach.\(^7\)

The natural rate of interest (NRI or \( \rho \)) is a pure commodity rate, and it is thus determined by the scarcity of savings (capital).\(^8\) In other words, NRI 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, p. 102). The loan interest rate (\( r \)) is the interest rate on bank loans which is set by the banking system when granting credit to entrepreneurs. In equilibrium, the banking system sets (\( r \)) equal to NRI. However, this equilibrium condition is only obtained by chance. The loan rate is fixed in a discretionary way by the banking system. It is thus a controlled or contractual rate. By contrast, NRI is defined \textit{in natura}, i.e. it is governed by the marginal productivity of capital. Importantly, NRI is not a constant, but it changes as a result of movements of the variables affecting the marginal productivity of capital. The coincidence between (\( r \)) and (\( \rho \)) is thus accidental. Indeed, their difference is the main explanation for changes in the price level. In other words, and against the conclusions of the quantity theory of money, by setting a loan rate (\( r \)) lower (higher) than the exogenously shifting natural rate of interest (\( \rho \)), the banking system fuels an inflationary (deflationary) process which will only stop when (\( r \)) is raised (lowered) to the level of (\( \rho \)). The story goes like that. When (\( r \)) is lower than (\( \rho \)), by borrowing money from the banking system, entrepreneurs (i.e. investors) can gain a positive (extra) profit at the expense of merchant capitalists (i.e. savers). The opposite would occur if the banking
system maintains (r) above (ρ). In short, whenever the banking system sets a loan rate different from NRI, investment is different from savings. In algebraic terms, the difference between investment and savings is a positive function of the gap between the NRI and the loan rate:

\[(I - S) = f(\rho - r) \quad (1)\]

Importantly, any difference between investment and savings triggers changes in the price level. For instance, when the loan rate (r) is set to a lower level than the NRI (ρ), entrepreneurs can gain a positive (extra) profit. Therefore, they increase the demand for bank loans. Since in Wicksell’s “pure credit economy” the banking system can create *ex nihilo* credit in excess of merchant capitalists’ savings, the supply of credit increases. However, Wicksell assumes that the normal situation of the economy is characterised by full employment, with the result then that an increase in spending by entrepreneurs causes an increase in the price level (P). In algebraic terms, this means that the inflationary process (π) is function of the difference between investment and savings, and hence, through Equation 1 above, of the gap between NRI and the loan rate:

\[\pi = \frac{\Delta P}{P} = g(\rho - r) \quad (2)\]

It is noteworthy to mention that the inflationary or deflationary process described by Equations (1) and (2) strongly depends on the existence of a perfectly elastic supply of credit. In other words, it is the *ex nihilo* supply of credit that makes the inflationary or deflationary process possible. This does not mean, like the quantity theorists would like, that changes in monetary aggregates cause changes in the price level. Rather, in Wicksell’s “pure credit economy” money is essential, because it alters the nature of the
object of analysis from a barter economy to a true monetary economy. There is no place where the real savings of the merchant capitalists match the real investment of entrepreneurs. Similarly, there is no price which clears the capital market. In other words, the existence of a capital market, together with the adjustment role of the interest rate is de facto denied. Therefore, there is no built-in automatic self-adjustment mechanism at work, when investment and savings are not equal. The existence of money, meaning a pure bank liability with no intrinsic value and no necessary relation to an exogenous monetary aggregate, together with the presence of an organised banking system that fully supplies loans on demand is supportive of any possible relationship between investment and savings. Thus, since in Wicksell’s “pure credit economy” there is no capital market, and hence the interest rate is a monetary rather than a real phenomenon, then the equality of the loan rate and NRI can only happen by pure chance. This means that the inequality between savings and investment is the norm, rather than the exception. More importantly, there is no self-adjusting mechanism to offset any inequality. Cumulative inflation or deflation, and economic instability follow, at least as long as the banking system does not move the loan rate to the level of NRI.

It has already been mentioned that this possibility [i.e. \( r \neq \rho \) and hence positive or negative entrepreneur profits] arises out of the fact that the transfer of capital and the remuneration of factors of production do not take place in kind, but are effected in an entirely indirect manner as a result of the intervention of money. It is not, as is so often supposed, merely the form of the matter that is thus altered, but its very essence. For real capital goods can no longer be supposed to be actually borrowed and lent; they are now bought and sold. An increase in the demand for real capital goods is no longer a borrowers’ demand which tends to raise the rate of interest, but a buyers’ demand which tends to raise the prices of commodities. But money, which is the one thing for which there is really a demand for lending purposes, is elastic in amount. Its quantity can to some extent be accommodated – and in a completely developed credit system the accommodation is complete – to any position that the demand may assume (Wicksell 1936, p. 135; italics in the original; See also p. 110).
In terms of the conclusions of Hicks’s analysis, it means that Wicksell’s analysis reject both propositions of the W-Classics and the S-Classics approaches to monetary policy, namely that (a) theoretical analyses of monetary policy should be conducted exclusively in terms of monetary aggregates, and (b) correlation between monetary aggregates and inflation has to be interpreted in terms of an unidirectional causal relationship. Equation (1) together with the long quote above shows that the banking system sets the interest rate, and then accommodates any demand for credit by credit-worthy entrepreneurs. Putting it in modern language, the monetary variable that matters is the loan rate set by the banking system. Monetary aggregates are via the demand for credit of entrepreneurs the outcome of the lending activity of the banking system. They are thus an endogenous variable determined at the end of the production process described above. As for the causality between monetary aggregates and prices, in accordance with Equation (2) above, Wicksell argues that “the rise in prices is, strictly speaking, primary and the increase of credit media secondary” (Wicksell 1935, p. 168). In other words, in a monetary economy like Wicksell’s monetary “pure credit economy”, monetary aggregates are the result of, rather than the cause of, changes in the price level.

4 The Modern Wicksellian Approach to Monetary Policy: the “New Consensus” View

The previous section has shown that Wicksell’s “pure credit economy” provides an alternative framework to both the W-Classics and the S-Classics approaches to money and monetary policy. Interestingly, Wicksell’s “pure credit economy” has been recently claimed as the main source of inspiration for the modern approach to money and
monetary policy. Woodford (2003) and his “New Consensus” colleagues have explicitly abandoned the quantity theoretic framework for a Wicksellian two-interest rates analysis.¹⁰

Fontana and 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 neo-classical synthesis dichotomy between the real and monetary sectors. The only lasting effects of aggregate demand fine-tuning through interest rates management are on the price and wage levels, whereas aggregate supply is responsible for changes in the level of output and employment. The modification to the old neo-classical synthesis comes from New Keynesian propositions, supported by a variety of micro-founded models, that nominal rigidities prevent wage and price clearing the labour market and goods market, more or less continuously. These nominal rigidities provide thus the rationale for some short-run real effects due to changes in monetary variables. However, once the nominal rigidities disappear, the real effects vanish altogether. Therefore, from this perspective “New Consensus” models have accomplished what Lucas had suggested in his Nobel lecture, though in a theoretical framework that relies on changes in interest rates rather than monetary aggregates. A sound analysis of the effects of monetary policy now lies in real business cycle models, which are based on the notion of dynamically optimizing agents in a world characterised by stochastic shocks, to which are added some nominal rigidities.

In its most basic form, the policy implications of the “New Consensus” view in macroeconomics can be represented by an appropriately amended set of three equations,
describing the dynamics of the interest rate, output gap, and inflation. For the sake of simplicity, the important role of lags, expectations, and errors terms are ignored in this basic representation of the “New Consensus” view. The first equation represents the aggregate demand, the second is related to the aggregate supply, and the third indicates the monetary policy strategy:

\begin{align}
    y - \bar{y} &= h(\rho - r) \\
    \pi &= g(y - \bar{y}) \\
    r + \pi &= \rho + \pi^* + h(p - p^*)
\end{align}

Equation (3) is an IS curve relating the output gap to the difference between the NRI (ρ) and the loan rate (r), and hence via Equation (1) to the gap between investment and savings. Equation (4) expresses the change in the current rate of inflation (π) as a function of the output gap, which is defined as the difference between actual (y) and potential (\(\bar{y}\)) levels of output. Finally, Equation (5) shows a simple monetary policy strategy. The nominal interest rate (r + π) deviates from the level consistent with the NRI and the target inflation rate (π*), if the current price level deviates from target.

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, monetary aggregates do not appear in any equation. For instance, the do not appear in the aggregate demand equation. In the early 1970s, Equation (3) will have been a reduced form of the IS-LM model, and hence it will have implied an important role for monetary aggregates. As it is written now, the aggregate demand function of Equation (3) is coincident with the IS curve, and the LM relationship has been dropped. More importantly, monetary aggregates do not appear in Equation (5), which describes a simple
monetary policy strategy. Consistency with the quantity theory of money would indeed require replacing Equation (5) with an LM curve type of equation like (6) (see, e.g., Laidler 2002; Fontana and Palacio Vera 2004):

\[
\frac{M}{P} = m(r, y) \quad (6)
\]

The key difference between Equation (5) and Equation (6) is related to Hicks’s suggestion for discriminating between different operating procedures of monetary policy. Modern central banks aim to control interest rates, and not monetary aggregates. Equation (6) could certainly be added to the set of Equations (3-5), but it would contribute nothing to the operation of the “New Consensus” model, in the sense that the monetary aggregate thereby determined is akin to a residual, and does not feedback to affect other variables in the model.

A second observation that can be derived from the “New Consensus” model relates to the role of inflation, and its relationship with interest rates. Equation (5) is written in terms of a nominal interest rate, namely the sum of the real interest rate \( r \) and the current inflation rate \( \pi \). This interest rate is nothing but Wicksell’s loan rate in nominal terms, and is usually set by the banking system as a fixed mark-up on the short-run nominal interest rate controlled by the central bank. Therefore, as long as there are price and wage rigidities, by changing the short-run nominal interest rate, the central bank is able to affect the real interest rate \( r \). In this way, through Equation (3) the central bank is able to manipulate the output gap \( (y - \bar{y}) \), and then via Equation (4) the inflation rate \( \pi \). For this reason, as long as there are price and wage rigidities, the central bank can be safely subsumed within the banking system, and the short-run nominal
interest rate set by the central bank can be represented by Wicksell’s real loan rate \((r)\) (Meyer 2001, pp. 4-5).

From equation (3), it is then clear that when the loan rate \((r)\) is at the NRI level \((\rho)\), the actual level of output \((y)\) is at its potential level \((\bar{y})\). Equation (4) then shows that the inflation rate is constant, which means via Equation (5) that the current inflation rate \((\pi)\) is at its target level \((\pi^*)\), corrected by any difference between the current and target price levels. Therefore, the question is how the central bank is able to set \((r)\) just at the NRI level. It is here that most of the Wicksellian features of the “New Consensus” view come to the forefront:

According to our line of approach, they [proposals for stabilizing the value of money] can attain their objective only in so far as they exert an indirect influence on the money rate of interest, and bring it into line with the natural rate … This does not mean that the banks ought actually to ascertain the natural rate before fixing their own rates of interest. That would, of course, be impracticable, and would also be quite unnecessary. For the current level of commodity prices provides a reliable test of the agreement or diversion of the two rates. The procedure should rather be simply as follows: So long as prices remain unaltered the banks’ rate of interest is to remain unaltered. If prices rise, the rate of interest is to be raised; and if prices fall, the rate of interest is to be lowered; and the rate of interest is henceforth to be maintained at its new level until a further movement of prices calls for a further change in one direction or the other. The more promptly these changes are undertaken the smaller is the possibility of considerable fluctuations of the general level of prices; and the smaller and less frequent will have to be the changes in the rates of interest. If prices are kept fairly stable the rate of interest will merely have to keep step with such rise or fall in the natural rate as is inevitable (Wicksell 1936, pp. 188-189; italics in the original).

This long quote summarises Wicksell’s view of changes in the price level as a summary statistics telling the state of imbalance in the economy. A divergence between the demand for and the supply of a commodity causes a movement in the price of this particular commodity. Therefore, Wicksell argues, any movement of the aggregate price
level must be caused by a divergence between aggregate demand and aggregate supply. In other words, the banking system does not need to ascertain NRI before setting the loan rate (r). As long as the aggregate price level is constant, the banking system can be confident that the loan rate is matching NRI, and it only needs to respond to movements in one direction or the other of the price level.

In similar fashion, the proponents of the “New Consensus” view maintains that inflation is indicative of an imbalance in the economy, namely the level of aggregate demand being higher than the full employment level of aggregate supply. This excessive level of aggregate demand puts pressure in the goods and labour markets with the result of an increase in the inflation rate. It should be added that, because there are inflation measurements errors, and in order to retain some flexibility in setting interest rates, in modern economies a monetary policy goal of price stability is usually translated in a positive rate of inflation of around 2%. Therefore, in the “New Consensus” view, as long as the inflation rate is around 2%, central banks can be confident that the loan rate is matching NRI. It is only when the current inflation rate is different from around 2% that they have to engage in output gap fine-tuning policy via changes in the loan rate (r).

Equations (3-5) describe the dynamics of inflation, output and interest rate when the current rate of inflation is not at its target level of around 2%. For instance, given short-run price and wage rigidities and a fixed mark-up, if the central bank sets the short-run nominal interest rate at a level such that the resulting loan rate (r) is lower than the NRI (ρ), then aggregate demand will be higher than aggregate supply, and hence via Equation (3) a positive gap emerges between actual (y) and potential (\(\bar{y}\)) levels of output. Equation (4) then shows that the inflation rate increases.
Therefore, the policy implications of the “New Consensus” model, as it is represented by the appropriately amended set of Equations (3-5), are similar to Wicksell’s “pure credit economy” analysis. If there is an increase in the inflation rate, the central bank simply needs to increase the short-term nominal interest rate and, given short-run price and wage sluggishness and a fixed mark-up, the real interest rate (r) will rise in similar fashion. As a result of it, the 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) back to its NRI 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. In short, as long as the loan rate (r) is set equal to the NRI level (ρ), the economy is at full potential, with investment matchings savings, and the price level (for Wicksell), or the inflation rate (for supporters of the “New Consensus”) being constant.

5 Concluding Remarks

Hicks has maintained that monetary theory is intrinsically related to, and evolve as a result of, real monetary events. Similarly, Hicks has argued that the realism of monetary theory still leave economists with the freedom of framing their analysis of money and monetary policy in terms of the dual choice between the economic variable that matters, namely a monetary aggregate or the interest rate, and the real versus nominal effects of monetary policy. Drawing on this suggestion, the purpose of this paper has been to discuss the role of money and interest rate in the theory of monetary policy in an historical perspective. The traditional/classical response to this dual choice has been
framed within a quantity theoretic framework. The central bank controls the quantity of money with the exclusive purpose of stabilising the price level. This does not mean that some short-run effects of monetary policy are excluded. In fact, the paper has maintained Hicks’s distinction between a strong and a weak version of the classical approach. The latter but not the former does accept that monetary policy has temporary effects on the level of output and employment, mainly during the disequilibrium process following a change in the money supply. However, both versions of the classical approach subscribe to the long-run axiom of neutrality of money and monetary policy.

The axiom of long-run axiom of neutrality of money and monetary policy is also at the heart of the new approach to monetary policy, the so-called “New Consensus” view. However, theorists as well as practitioners of the “New Consensus” view have rejected the quantity theoretic framework of the classical approach. More precisely, they have rejected two fundamental propositions of the classical theory of money and monetary policy. Firstly, the monetary variable controlled by the central bank is not the money supply, but rather the interest rate. Secondly, the causal relationship between the money supply and the price level is not from the former to the latter, but the other way round. Modern theorists and central bankers around the world have replaced the quantity theoretic framework with a Wicksellian framework, which highlights the role of the interest rate in managing the economy toward an implicitly or explicitly determined level of inflation. By changing the nominal interest rate, and given some short-run nominal rigidities, the central bank is able to manipulate the level of aggregate demand, and hence the output gap toward a level that is compatible with the desired level of inflation. From this perspective, the modern approach to money and monetary policy is thus quite
revolutionary in their rejection of the quantity theoretic framework. As the quote from the Economist suggests, modern central bankers and theorists have indeed abandoned monetarism and its policy conclusions.

What is less revolutionary with the “New Consensus” view is the acceptance of one of the most characteristic features of the old quantity theoretic framework, namely the axiom of long-run neutrality of money and monetary policy. This means that despite all theoretical differences, the “New Consensus” view leads to the same policy conclusions of the S-Classics and W-Classics approaches, though via a theoretical framework that has replaced monetary aggregates with interest rates. 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 similar way the “New Consensus” view maintains that the interest rate \( r \) never influences the potential level of output \( \bar{Y} \). In other words, proponents of the “New Consensus” view hold that interest rate policy strategies via changes in the aggregate demand only affect the current level of output. By contrast, the aggregate supply, which is exogenously determined by the level of capital, workforce and technology is the exclusive determinant of the potential level of output. Putting it differently, the interest rate \( r \) does not have any effect on its NRI level \( \rho \). This is an interesting point because it was originally raised also against Wicksell’s two-interest rates analysis.

In the introduction to the English translation of *Interest and Prices* (1936), Bertil Ohlin explains that in the Swedish edition of the *Lectures* (1935) Wicksell accepted as a concession to his critics the possibility of the interdependence between the loan rate and
the natural rate of interest. The concession is further discussed in the last chapter of the

*Lectures*:

The objection has been raised to the whole of the above reasoning that a lowering of the loan rate must also depress the real rate so that the difference between them is more and more levelled out and thus the stimulus to a continued rise in prices is eliminated. This possibility certainly cannot be entirely rejected. *Ceteris paribus* a lowering of the real rate unconditionally demands new real capital, i.e. increased saving. But this would certainly occur, even if involuntarily, owing to the fact that higher prices would compel a restriction of consumption on the part of those people who had fixed money incomes … [if this] prevails, and if production is unable to absorb unlimited quantities of new capital without a reduction in net yield, then the incipient rise in prices, though it would certainly not recede, might yet be arrested, unless the banks reduced their rate still further. … We may assume that the above-mentioned counteracting forces may be referred to what we have described as the secondary factors of the problem (Wicksell 1935, pp. 198-199).

According to Wicksell the possible interdependence between the loan rate (r) and the NRI level (ρ) works through the effects of a change in the price level on the consumption plans of some economic agents. A reduction in the loan rate will increase *ceteris paribus* the price level which will negatively affect the consumption expenditure of fixed-income agents. As a result of it, aggregate demand will be negatively affected with the result of an excess supply in the good market. The final outcome is a reduction of the natural rate of interest, and of the price level.

In terms of the set of Equations (3-5), the possible interdependence between the loan rate (r) and the NRI level (ρ) means that changes in the loan rate have the potential to affect both the level of aggregate demand, and hence current output, as well as the level of aggregate supply and potential output. In other words, by changing the short-run nominal interest rate, the central bank may actually affect both component of the output gap, with dramatic consequences for the long-run level of output and employment in a country. For instance, a vicious circle may start off, where the central bank increases the
interest rate in order to manage an appropriate level of aggregate demand consistent with a desired level of inflation, and by doing it the central bank also affects negatively the potential level of output. This means that next time the central bank has to increase again the interest rate in order to achieve an output gap consistent with the desirable level of inflation, and so on. Similar conclusions, but of opposite sign, can be derived in the case of a decrease in the loan rate. The implication of this argument is that the Wicksellian framework of the “New Consensus” view rests on the separation between aggregate demand and aggregate supply or, what amount to be the same thing, between the loan rate and the natural rate. If this separation holds, then also the axiom of long-run neutrality of money and monetary policy holds. However, as Wicksell had to admit, the interdependence between the loan rate and the natural rate cannot be excluded. But once this possibility is admitted, it follows that the axiom of long-run neutrality of money and monetary policy rests on very precarious foundations, and so it does the modern “New Consensus” view.
References


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2 See also, Chick (1977, Ch. 1).

3 However, as famously pointed out by Tobin (1970) in early criticisms of the monetarist theory, these high correlation rates do not have any implication for the causality between inflation and monetary aggregates. If the central bank allows the growth rate of money supply to adjust to changes of e.g. oil price,
the correlation between inflation and the growth rate of money will be close to one, but the direction of
causality is just the opposite of what is implied by the quantity theory of money.

4 It goes without saying that it is implicitly assumed that there are no hysteresis effects in the W-
Classics theory of money, namely no effects of the short-run time path of output on the long run position of
the economy (e.g. no lasting effects of unemployment on the labour supply, and no effects of reduced
short-run investment on the capital stock).

5 For the sake of simplicity, rent and other input payments are ignored.

6 See, for instance, Graziani (2003) for a modern development of Wicksell’s sequential analysis.
See also note 9 below.

7 According to Hutchinson, the historical origin of Wicksell’s monetary analysis is to be found in
Ricardo’s discussion of the relation between the quantity of money and the interest rate on one side, and
Tooke’s criticism of the quantity theory of money on the other (Hutchinson 1953, pp. 235-245). In
particular, see Ricardo (1951, p. 364) for an early statement of Wicksell’s two interest rate analysis which
was later acknowledged by Wicksell himself (1935, p. 200).

8 See Secareccia (2003) for a discussion of the Wicksell’s two-interest rate analysis and its
relation to Friedman’s natural rate of unemployment analysis.

9 See Bellofiore (2005) for a further discussion of this idea in relation to the work of Keynes and
Schumpeter.

10 Interestingly, the same source of inspiration has been claimed by a different group of
economists, the Circuitists (Graziani 2003), and more generally the “Endogenous Money” theorists
(Fontana 2004). For instance, Graziani explicitly refers to Wicksell’s “pure credit economy” as the core
model of the theory of the monetary circuit (Graziani 2003, p. 1; p. 27, n. 12; Realfonzo 2006).
Unfortunately, for obvious reasons this parallel development of Wicksell’s analysis cannot be pursued here.
However, in the final section of this paper will be argued that some of the key differences between the
“New Consensus” view and the “Endogenous Money” view can be located in Wicksell’s discussion of the
relationship between the natural rate of interest (NRI) on one side, and the loan rate on the other side.
See Woodford (2003) for a discussion of the role played by lags and expectations in modern monetary policy strategies.

See, for a growth rate interpretation of Equations 3-5, Fontana and Palacio Vera (2005).