

# The Wicksellian Flavour in macroeconomics\*

Nicolas Barbaroux\*\*

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**Resumen:** la macroeconomía encontró en Johan Gustav Knut Wicksell un nuevo líder. La aparición y el desarrollo reciente de los modelos nuevos keynesianos –también llamados modelos de la nueva síntesis neoclásica, abogan por un renacimiento de las ideas wickselianas en macroeconomía. En efecto, la herencia wickseliana se entiende no solamente a partir de la política monetaria bajo la forma de reglas, sino además a partir del papel que juega la cantidad de dinero en la elaboración de la política monetaria. La publicación de *Interest and Prices* por Woodford en 2003 legitima explícitamente este “sabor” wickseliano. Este artículo presenta un estudio de las consecuencias de esta herencia en la elaboración de la política monetaria, y particularmente, se tratarán las consecuencias sobre la corriente monetarista. ¿En qué medida el

renacimiento de la ideas wickselianas en macroeconomía son sinónimo o no del fin del monetarismo?

**Palabras clave:** Woodford, Wicksell, política monetaria, monetarismo

**Abstract:** macroeconomics found its new *sacrosaint* economist in the person of Johan Gustav Knut Wicksell. The recent development of New Keynesian models –or models from the New Neo-Classical Synthesis– plead in favour of a Wicksellian revival. Not only does the actual monetary policy framework take the form of a monetary policy rule –in line with Wicksell’s original theory– but the recent development of the late 1990’s models also legitimates such Wicksellian flag due to their *de-emphasis* of money. The highest point of interest was taken with the

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\*\* University J. Monnet, 6 Rue Basse des Rives, 42 023 ST ETIENNE Cedex, (France). E-mail: Nicolas.Barbaroux@univ-st-etienne.fr, CREUSET- CNRS FRE 2938.

publication of Woodford's *Interest and Prices* in 2003 that explicitly assumed a *Wicksellian flavour*. The aim of this paper is to study the policy implications of such a Wicksellian inheritance and to determine the extent to which such a Wicksellian wind in macroeconomics is synonymous of the end of Monetarism.

**Keywords:** Woodford, Wicksell, monetary policy, monetarism.

**Résumé :** la macroéconomie a trouvé son nouveau chef de file en la personne de Johan Gustav Knut Wicksell. L'apparition et le développement récents des modèles des Nouveaux Keynésiens, ou des modèles de la Nouvelle Synthèse Néo-Classique, plaident en faveur d'une résurgence des racines wickselliennes en macroéconomie. En effet, l'héritage wicksellien s'entend non seulement du fait de la formulation de la politique monétaire sous la forme d'un règle; mais aussi et surtout de part la restriction du rôle donné à la monnaie pour l'élaboration de la politique monétaire. La publication d'*Interest and Prices* par Woodford en 2003 marque un tournant dans la mesure où ce dernier légitime explicitement sa «saveur» wicksellienne. L'objectif de cet article consiste à étudier les conséquences d'un tel héritage pour l'élaboration de la politique monétaire. Plus particulièrement, c'est la question de la fin du Monétarisme qui sera posée. Dans quelle mesure la résurgence de racines wickselliennes en macroéconomie est-elle synonyme (ou non) de la fin du courant Monétariste?

**Mots clef:** Woodford, Wicksell, politique monétaire, monetarisme.

**Clasificación JEL:** B22, E13, E31, E43, E52.

## Introduction

*Monetarism is dead! Central bankers are all Wicksellians now! They target low inflation rates, with no regard to monetary aggregates whatsoever, by acting upon short-term real rates of interest. This is the New Consensus in monetary economics or simply the New Keynesian Synthesis.*

M. Lavoie, M. Seccareccia, 2004

The emergence of the Austrian theorists-Carl Menger and Eugen von Böhm-Bawerk was of great value for the evolution, if not to say *revolution* (Woodford, 1999) in macroeconomics. By focusing on the *roundabout* process,<sup>1</sup> the Austrians emphasised a peculiar relative price: the *interest rate*. By allowing the coordination of individual decisions at different points in time, the interest rate became an important element for the stability of the economic system. At the same time when it fails to fulfil its duty, the interest rate can, conversely, bring about serious consequences for the economy (such as an inflationary/deflationary process with the associated growth/recession process). It is for these reasons, that the interest rate has attracted such attention from the economists.

1 The concept of *roundaboutness* is of great value since it focuses attention on the idea that current saving involves deferring consumption into the future, and current investment provides the economy with the capacity to supply that future consumption. Thus, the main determinant of the economic stability is the interest rate.

The same thing is said concerning Knut Wicksell and his influence in macroeconomics. Even if the extent to which the actual macroeconomics is Wicksellian is not crystal clear, we can not deny that Wicksell's monetary works are nowadays widely recognized as being a pillar in recent macroeconomic theories (Woodford, 2003; Mc Callum, 2005, Tamborini 2006). The opening quotation from the New Keynesians is quite clear in this sense. If Wicksell has been raised from the dead it is due to his emphasis on an ideal type of economy –called the *pure credit system*– in which “*all domestic payments are effected by means of Giro system and bookkeeping transfers*” (Wicksell, 1936 (1898), p. 70). In short, what macroeconomics remembers today from Wicksell is the *cashless* framework. This is precisely what allows Woodford to define his own work under the label of *Neo-Wicksellian* (2003).<sup>2</sup>

The aim of this paper is to recall the general features of Wicksell's monetary work, particularly the pure credit system, in order to analyze to what extent the new *consensus* in macroeconomics –represented by Woodford's approach– is synonymous of a demise of Monetarism. This article will begin by outlining the essential features of Wicksell's original theory and subsequently presenting the monetary policy implications of Woodford's model. The “*anti-monetarist approach*” (Mc Callum, 2005) of Woodford's model will be explored by studying the reaction from

the Neo-monetarist economists such as Nelson, Mc Callum or Meltzer. The last section will conclude.

## I. Wicksell and Woodford: an economy without money?

It would seem that policymakers found their own *bible* since the publication of Woodford's monetary treatise in 2003. Such a *New Wicksellian* theory holds a leading place in macroeconomics by simply taking into account the increasing number of reactions that Woodford's “*Interest and Prices*” provoked (Green, 2005; Nakajima, 2005; Zouache (with Trautwein), 2005; Zouache, 2004, Mc Callum, 2005; Laidler, 2007; Goodhart, 2005). Woodford's landmark and distinctive feature, notably towards the traditionnal New Neoclassical Synthesis lies in his explicit reference to Knut Wicksell.<sup>3</sup> Within this Woodfordian version of the New Neoclassical Synthesis, the concept of *pure credit economy* (Wicksell, 1936 (1898) & 1935 (1906) –or *cashless economy* in Woodfordian terms– holds a leading place.

### Wicksell's original theory: a pure credit system

In the early 20<sup>th</sup> century, Wicksell was seen as a *pioneer* in monetary policymaking because he pleaded in favour of a monetary policy under the form of a monetary interest rate rule. At that time such policymaking was seen as *heterodox* since the context

2 Woodford took voluntarily the same title as Wicksell's first monetary book (1898) saying more than anything else about Wicksell's inheritance in Woodford's work.

3 The label *New Wicksellian* has to be understood as a distinction from New Neoclassical Synthesis theory. Woodford distinguishes his own theory by neglecting real balance effects and by assuming that inflation is determined by an interest rate gap which can be eliminated by the use of an interest rate feedback rule.

was one of the devotion to the rule of the gold standard system.<sup>4</sup> Wicksell was entirely opposed to any monetary use of gold because of its two opposite functions (gold as *money* and gold as *raw material* for the industry). Instead, he proposed to substitute a free floating currency system in which the purchasing power of money was guaranteed by the fluctuation of the (*banking*) interest rate. In his first monetary opus—entitled “*Interest and Prices*”, Wicksell aimed to give a clear statement of the origin of the fluctuation of prices during the second half of the 19<sup>th</sup> century.<sup>5</sup>

By removing the fixed velocity assumption in the Quantity relationship, Wicksell endogenized this hypothesis by introducing several frameworks for the economy. He introduced two hypothetical types of economy in which the velocity of circulation is a *dependent* variable of the type of economy considered.<sup>6</sup> Wicksell, first, created a *pure cash system* and, then, its opposite, a *pure credit system*.<sup>7</sup> The thesis supported by Wicksell was that the inflationary (deflationary) process emerged from an increase

(decrease) of the velocity of circulation of money.<sup>8</sup> Consequently, the causality link between money and prices changes as soon as banks enter into the economic framework. Wicksell highlighted  $V$  in the explanation of the transmission-mechanism between  $M$  (the stock of money) and  $P$  (the level of commodity prices). Thus Wicksell’s monetary thesis should be understood as an attempt “*to restate the Quantity theory in credit-theoretical-terms.*” (Trautwein/Boianovsky, 2001, p. 500).

Wicksell’s “pure credit economy” was a model in which *cash* money did not exist. More precisely, it was a banking economy with the centralisation of lending by banks and monetary institutions where “*all domestic payments are effected by means of Giro system and bookkeeping transfers*” (Wicksell, 1936 (1898), p.70). In this purely imaginary case “*money does not actually circulate at all, neither in the form of coin (except perhaps as small change) nor in the form of notes*” (*ibid.*). The elasticity of money can therefore be adapted to whatever quantity of money needed.

4 The outstanding problem that prevailed in the nineteenth century was the instability of the price level. In such a context, Political Economy was unsure of which the monetary system it should adopt. This period was one in which the Bimetallism controversy prevailed and separated the economists in two opposite factions.

5 The nineteenth century is probably one of the most disordered both in terms of fluctuations in the level of activity and in terms of level of prices. The second half of the century was stricken by opposite movements of both inflation (1851-1871) and deflation (from 1873-1895).

6 The approach was that if we are able to understand the origin of the fluctuations in prices troubled for each of these imaginary cases, then we can solve the problem of the instability of prices in the actual system since “the monetary system actually employed can then be regarded as *combinations* of these two extreme types” (Wicksell, 1936 (1898), p. 70).

7 In reality, he introduces two intermediary stages within the “*pure credit economy*”: the case of a simple credit economy (or *unorganised* credit system) and that of an organised credit economy. For a sake of simplicity, however, we will consider the “pure credit system” as a unique one.

8 We should bear in mind that the 19<sup>th</sup> century is characterised by the increasing use of credit instruments—such as ordinary credit or bills of exchange—which in turn bring about an acceleration in the circulation of money. In Wicksell’s mind, credit is seen as a *powerful pulley* which “*quicken*s” the circulation of money (Wicksell, 1935 (1906), p. 65).

The key element in Wicksell's "imaginary cashless economy" lies in the presence of two kinds of interest rates: a *monetary* interest rate –charged by banks– and an (exogenous) *natural* interest rate which coordinate saving and investment decisions. In this institutional framework, there might be no endogenous equilibrating mechanism capable of restoring equilibrium. By considering that bankers are *routiners* and that the disequilibrium emerged from real disturbances that disturbed the natural rate. Each time the economy is threatened by real shocks, then misalignment between the two rates becomes the rule. A *cumulative process* is then emerging and it is the duty of monetary policy to restore equilibrium by a change in the monetary rate. For this reason, Wicksell proposed that banks—or the central bank—should follow a common behaviour or a common monetary rule. The Wicksellian monetary rule was defined as follows: "If prices rise, the rate of interest is to be raised; and the 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" (Wicksell, 1936 (1898), p. 189).

Monetary policy is no more than an interest rate rule management in agreement with the eponymous one proposed by

Taylor in 1993. In fact, the *monetary rate* –controlled by the banks or by a central bank– should move at par with the *natural rate* in order to discourage the emergence of a cumulative process.<sup>9</sup> In other words, the demand for consumption goods and the economy's capacity to supply them would be equilibrated through an interest rate rule regulation. As an analogy to Friedman's famous quotation, we can say that inflation is *always and everywhere a banking phenomenon* since it is created by the mismatch between the monetary and natural rates.

#### Woodford Neo-Wicksellianism: a Cashless Economy

The major advance in Woodford's treatise is that it has demonstrated how monetary policy, in the form of an *instrument rule*, can correct inefficiency, *i.e.* output gap, by targeting the nominal interest rate at its natural level.<sup>10</sup> In fact, when the economy functions within a monopolistic framework –with stickiness on prices or on wages– the final outcome is under-optimal. Consequently, monetary policy has to regulate it. Following the path opened by Wicksell, Woodford proposes a monetary policy framework –called the *cashless model*– in which "*there are assumed to be no transactions frictions that can be reduced through the use of*

9 The Wicksellian *cumulative process* emerges as follow: let's consider that the monetary rate is below the natural one, the firms are pushed to borrow from banks and undertake investments. Their expenditure of newly borrowed money would bid up prices of the inputs in investment goods industries, so that relative prices would be distorted and the roundabout process would begin to be lengthened. At the same time, an excess demand for current consumption appears and the economy is in disequilibrium. We turn then to the idea of forced saving which argues that a too low monetary rate will create an increasing monetary expansion –via credit tools– which in its turn will bid up monetary prices and in the end will push the economy's factors to be *reallocated* among the most efficient industries.

10 The definition of the natural rate in Woodford's approach is a tricky question. Most of the time the natural rate of interest is defined as the real rate of interest required to keep aggregate demand equal all the times to the natural output. By *natural output*, we mean a virtual equilibrium in which the equilibrium output is determined by perfectly flexible wages and prices (Trautwein, 2005).

money balances, and that accordingly provide a reason for holding such balances even when they earn a rate of return" (Woodford, 2003, p. 61). Money is defined as "a claim to a certain quantity of a liability of the central bank, which may or may not have any physical existence" (Woodford, 2003, p. 63). Money is therefore no more than *base money*. As presented by Trautwein (2005) or Green (2005), Woodford's framework is a triad of equations that includes:

- An intertemporal IS equation: This links the aggregate demand for goods and services to the nominal rate of interest controlled by the central bank.<sup>11</sup> The expected short-term real rate of return determines the incentive for intertemporal substitution between expenditures in  $t$  and  $t+1$ .

$$x_t = E_t x_{t+1} - \sigma (\hat{i}_t - E_t r_t^n) \quad (1)$$

Where  $x_t$  is the actual output gap;  $E_t$  expresses the rationale expectation process;  $\sigma$  is the intertemporal elasticity of substitution of aggregate expenditure (notably between private and public expenditure);  $\hat{i}_t$  is the operating instrument of the central bank (here the nominal interest rate);  $r_t^n$  is the exogenous parameter for the variations in the natural rate of interest (due to real disturbances).<sup>12</sup> The idea of equation 1 is that the aggregate demand

depends upon the expected value for the output gap and the short-term nominal interest rate.

- An AS equation (also called New Keynesian Phillips curve): This links the rate of inflation to the gap between aggregate demand and a number of long-term equilibrium levels of aggregate supply and to the expected value of the inflation rate. Each departure of aggregate output from its natural rate gives firms an incentive to choose a higher price than the one compatible with the zero inflation trend rate. A gap therefore results and creates an inflationary (deflationary) process.

$$\pi_t = \kappa x_t + \beta E_t \pi_{t+1} \quad (2)$$

Where  $\pi_t$  is the inflation rate in  $t$ ;  $\kappa$  is a coefficient that depends on both the frequency of price adjustment and the elasticity of real marginal cost with respect to the level of real activity;  $\beta$  is the discount factor defined between 0 and 1;  $E_t$  is still the rationale expectation process and  $x_t$  is the output gap defined as the discrepancy between variation in the actual output and exogenous variation in the natural rate of output which results from several types of real disturbances. The log-linear AS relation is also called the *New Keynesian Phillips curve* because of the rationale

11 The IS equation is obtained by log-linearizing the first order household equilibrium conditions.

12 This term  $r_t^n$  represents the deviation of the Wicksellian natural rate from the value consistent with a zero inflation steady state rate.

expectation process that supplements the *old* Philips curve relationship.<sup>13</sup>

- A monetary Taylor policy rule:

$$\hat{i}_t = i_t^* + \Phi_\pi (\pi_t - \pi^*) + \Phi_x (x_t - x^*)/4 \quad (3)$$

Where  $i_t$  is the operating instrument of the central bank (here the nominal interest rate);  $i_t^*$  is an exogenous intercept that reflects variation in both the target rate  $\pi_t^*$  and an exogenous disturbance term (errors or mismeasurement by central bank);  $\Phi$  represents the monetary policy coefficients which allow for a greater or lesser weight on either of these two policy goals (inflation and output);  $\pi^*$  is the target rate of inflation and  $x^*$  is the steady state value of output consistent with the inflation target.

According to such a rule (3) *in the spirit of* Wicksell's proposed rule, we can say that the central bank's policy reaction function depends on both the actual output gap and the expected value of the inflation rate in the next period. Consequently commitments and credibility are the key factors of an *optimal* monetary policy. The term *Wicksellian* is justified by the fact that monetary policy should track variation in the natural rate (via the output gap) and that monetary policy should be conducted according to

an interest rate regulation. It is accurate to say that Woodford's monetary rule is more in the spirit of the Taylor's rule.

## II. The monetary policy implications of the Cashless Model

A decade ago, macroeconomics took a new path and reached a new *consensus* by admitting that economy should be considered under an IS-AS-monetary policy rule system in which –as we have just seen– money does not appear explicitly. The recent *consensus* in macroeconomics begins with the apparition of a *new* Neo-Classical Synthesis following the publication of King and Goodfriend's article in 1997.<sup>14</sup> The new synthesis focuses mainly on a framework in which the LM curve is questioned and substituted by a Taylor monetary rule equation. Woodford's work is part of this tendency in macroeconomy that consists in considering a world without money.<sup>15</sup>

### Consequences of the Wicksellian Inheritance

Woodford captures the “implied path of the money supply or the determinants of money demand” (Woodford, 2003, p. 237) in the determination of the equilibrium of output and prices, without having to model

13 The New Keynesian Philips curve is a response from Keynesian economists to both Friedman's 1968 sharp critique of the Keynesian Philips curve and to the rationale expectations school of thought in the 1970's (led by R. Lucas and T. Sargent). The principal answer was an attempt to build models that incorporate rationale expectations and that provide microeconomic foundations for monetary policy having at least short-run effects. The main microeconomic rationale has been *sticky prices* notably the 1983's staggered pricing model by Calvo. According to such New Keynesian Philips curve, the inflation rate can be expressed as a dynamic process with a forward looking flavour.

14 See Goodfriend and King (1997).

15 This new framework –and the resulting debate on the status of *money* within monetary policy deliberations– is materialized by the opposition between the ECB and the Fed. The first maintains the importance of monetary aggregates for the medium-long term scale, whereas the Fed gives them no role in monetary policy deliberations.

the volume of money explicitly. The Fed's monetary strategy is a prime illustration of this kind of policymaking.<sup>16</sup>

The Wicksellian *flavour*—and the resulting monetary policy— in Woodford's framework should be understood according to two points:

- (1) each inflation / deflation process results from exogenous roots that are not offset by changes in the central bank's overnight interest rate;
- (2) monetary policy should fight inflation/deflation process by an automatic answer of the nominal central bank's interest rate to changes in the price level.

Consequently, monetary policy should then, be conducted by a *rule* rather than *discretion*. This lies in tracking the fluctuation of the natural rate through variation in the nominal interest rate in a forward looking basis. Added to that, by stressing the importance of the current expectations to the future inflation rate Woodford insists on the idea that a monetary policy which is credible and which targets a low inflation rate is a good means of sustaining a low level of inflation. Inflation therefore is an endogenous phenomenon based on the expectations of the economic agents. Nothing is more important than the people's opinion concerning monetary policy. In the first two structural relationships (equation IS and AS), the disequilibrium is created by the actual household expectation on the future

inflation rate. In both cashless frameworks (Wicksell's and Woodford's) the key element in determining the equilibrium lies in the strict equality between the two types of interest rates; anytime the one condition for equilibrium is that the nominal (banking) interest rate should track the natural one. The efficiency of the central bank lies in its ability to peg its controlled interest rate with the fluctuation of the natural one, thereby informing us about the real shocks that threaten the economy.

The Wicksellian legacy allows Woodford to attest that monetary policy can abolish monetary aggregates as money is merely seen as a monetary unit of account. Such a downgradation of money does not entail what central bankers should do without money. It simply means that the conduct of monetary policy should be made through an interest rate regulation with regards to other parameters that influence the level of prices rather than the traditional monetary aggregates.

### The Specificity of Woodford's Approach

Woodford upholds his Wicksellian inheritance whilst admitting at the same time his scepticism concerning the fact that "*the Wicksellian theory (could) provide a basis for the kind of quantitative analysis in which a modern central bank must engage*" (Woodford, 2003, p. 5-6). The modern macroeconomic models are, therefore, not totally Wicksellian based. It is true that the world depicted by Woodford is a very

16 In March 2006 the Fed stopped publishing M3 considering that it did not convey useful information which was not already embodied in the narrow M2 or in other indicators containing useful information for the conduct of monetary policy.



specific one that is not totally in common with Wicksell's nor with the traditional New-Keynsian models. Woodford considers his model as micro-founded by the household optimization program. The representative agent –which consists of both the households and the firms– determines the respective levels of consumption and production in the single good (the IS curve). Such an optimization plan is based on a rationale expectation process. This assumption was not present in Wicksell's framework but it is used by Woodford to answer to Lucas' famous criticism of macroeconomic policy.<sup>17</sup> Considering that economic agents behave according to a rationale expectations process is a good means of removing uncertainty as agents have perfect foresight.

The most critical assumption made by Woodford concerns markets. In fact, Woodford considers them as *complete* and *frictionless*. More precisely, Woodford states that perfect competition occurs and prices adjust continuously to clear markets. The corollary is that “*no monetary assets are needed to facilitate transactions*” (Woodford, 2003, p. 63). In other words, money is not needed as there are no frictions from which the agent should be protected. Added to that, markets, and particularly financial ones, are also *complete* which means that there exist assets of many kinds that can protect households from uncertainty concerning future prices, future incomes or other shocks. Such a rough assumption

concerning markets incites them to wonder whether banks or any other whatever type of monetary institutions within the Woodford framework. Without money and with perfect financial markets what should the role of a bank be?

Another point that is still unclear is the extent to which the central bank is able to fix the price of the liability that it issues. In fact, Woodford defines the central bank as an “*issuer of liability*” (Woodford, 2003, p. 63) which fixes the level of interest concerning its liabilities. The representative household owes wealth in two distinctive forms: the monetary wealth under the form of the asset issue by the central bank and non monetary wealth under the form of asset's portfolio. Such an assumption of a central bank acting as *price maker* holds only in the case where markets are imperfect, *i.e.* the assets are not substitutes. If this is not the case, the representative agent could change the composition of his assets portfolio from the non monetary assets to monetary ones and vice versa. This assumption is significant as the model is mostly determined by the level of the interest rates. Any gap between the nominal interest rate –charged by the central bank– and the natural rate –which is compatible with a nil output gap– creates an output gap that will bring about a disequilibrium in the level of prices thereby pushing the central bank to react by changing the level of the nominal rate in order to restore the stability of the economic context.

17 Since Muth's work in 1961, it is common to consider that agents behave according to a rationale expectation process in the macroeconomics.

### III. Is Woodford's model a monetarism without money?

The introductory quotation suggested that the new consensus in macroeconomics is featured by a voluntary *de-emphasized* of money. Thus, it is not surprising that voices emerge (Meyers, 2001; Nelson, 2003; Laidler, 2004) not only to rebut such a strategy but also to draw opposing parallels between Woodford and the traditional Monetarism. Rejecting monetary aggregates logically raises the question as to whether Woodford's *Neo-Wicksellianism* is contrary to Monetarism. If it is not the case, what kind of Neo-Monetarism is it? Due to a lack of time, and because the debate is only recent, I will not pretend to be able to give a definite answer to this tricky interrogation. However, I would like to suggest few possible answers notably by redefining Monetarism.

#### Towards a New Definition of Monetarism?

Monetarism has held a central position in macroeconomics for the past two decades. In fact, Monetarism exerted a great influence –especially for the Bundesbank– for the conduct of monetary policy in the mid 1970's and 1980's. Such a current gave a prominent role to monetary aggregates due to the quantity postulates between base money and the inflation rate. If, nowadays, Monetarism is dead it is because it is widely admitted among policymakers that monetary aggregates no longer have

a reliable relationship with inflation or real activity.

By legitimating the neglect of money within the monetary policy frameworks New Keynesian models—particularly Woodford's provoked a tidal wave within the monetary ocean.<sup>18</sup> They were seen as an explicit disputation of the monetarists' precepts by many commentators. Such a theoretical struggle is perfectly enlightened by the two opposite monetary strategies of the Fed and the ECB. In fact, the ECB continues to assign a prominent role to monetary aggregates via its two pillar strategies. The Fed, on the contrary, bases its monetary strategy on an active interest rate management through open-market operations in which monetary aggregates play only a little role in monetary policy deliberations (Woodford, 2006).

As we have already seen, Woodford's landmark lies explicitly in his cashless framework thereby allowing him to ignore money. Regarding Monetarism it is true that New Keynesian models changed direction and took the opposite path by also legitimating a world without money. Nelson retained the *de-emphasis* of money as the main characteristic of those New Keynesian models. He defines them being those in which “*money does not enter explicitly as a state variable in the solution for output and inflation.*” (Nelson, 2003, p. 1051). Unsurprisingly, the reactions from *Neo-monetarists* –Nelson, Meltzer or Mc Callum to name only few– were quick. Following the publication of Woodford's

18 Woodford (2006, footnote 7, p. 6): «I call models of this kind “neo-Wicksellian” in order to draw attention to the fundamental role in such models of a transmission mechanism in which interest rates affect intertemporal spending decisions [...] but the terminology “new Keynesian” for such models become commonplace following Clarida et al (1999) among others.»

*Interest and Prices*” Nelson was the first to counter-attack with the publication of an enlightening article in 2003 entitled “*The Future of Monetary Aggregates in Monetary Policy Analysis*”. Several reproaches were made concerning New Keynesian models –and particularly concerning that of Woodford’s– on the basis of their misinterpretations of the monetarist precepts that they seemed to reject. Such errors incite them to neglect the relevant channels of monetary policy. Nelson, in fact, tried to preserve the relationship between the monetary aggregates and the inflation rate by demonstrating that such an empirical link holds if we allow a time lag between them (Nelson, 2003).<sup>19</sup> Nelson focuses on the money demand function, hence his main criticism of Woodford’s model. He advised Woodford to integrate a money demand function *à la* Friedman-Meltzer within his framework.<sup>20</sup> Laidler (2004) insists on money demand as well. He opens the door to restore the significance of money in Woodford’s framework by conducting a thorough study of the demand for bank deposits. In fact, based on Wicksell’s failure to analyze such a topic, Laidler (2004) concludes that the demand for bank deposits –in this cashless framework– is

motivated by the same *precautionary* and *transactionary* purposes as in the *pure cash* economy. The thesis supported by Nelson is that monetary policy should not only consider *short term* interest rates but also long-term interest rates. He demonstrated that there is a robust link between the monetary base and the long-term interest rate (Nelson, 2003).

Beyond that scope, the counter-attack from the *Neo*-monetarists has given birth to a new debate on the nature of Monetarism. An answer to this question, Nelson, whimsically, stresses what Monetarism is *not*. Contrary to what is commonly admitted, he assumes that: (1) Monetarism does not require the claim that traditional real balance effects<sup>21</sup> should play a central place in the IS equation;<sup>22</sup> (2) Monetarism does not depend on the presence of *explicit* terms involving a money stock in the Philips curve; (3) Monetarism does not need to base monetary policy on credit channel mechanisms;<sup>23</sup> (4) the Monetarist’s proposition “*does not require a belief that money demand is perfectly stable or that monetary aggregates play, or should play, an explicit role in either a price-setting or policy decisions*”. Such a definition and notably

19 Nelson (2003, p. 1039) demonstrated that such a causality link is relevant to US data (January 1970 to August 2002) if we integrate a lag of two, three and four years in the regression between the inflation rate and M2 money growth.

20 A Friedman-Meltzer demand function is one in which a spectrum of yields enters the money demand function. The idea is that not only the *short term* interest is integrated but also various yields brought by money such as physical assets.

21 The traditional real balance effect -inherited from Pigou- refers to the stimulus to consumption or aggregate demand from the increment to real financial wealth that occurs when the real monetary base increases.

22 Friedman (1972, p. 947): «*I never have believed that the real balance effect is of much empirical significance.*»

23 While stressing the importance of the interest rate as «*the preferred instrument of monetary policy*” Taylor concludes that “*money should continue to play an important role in monetary policy formulation in the future*” (Nelson, 2003, p. 1031).

the final proposition call Monetarism into question. So, what is Monetarism if it is not a theory that requires monetary aggregates to play a role in monetary policy deliberations? The answer can be found in Meyer (2001) who retains three distinctive features on Monetarism:

- The focus on long-run properties in agreement with the Classical tradition in macroeconomics: neutrality of money and the Quantity relationship;
- The emphasis on the long-run relationship between money and output or money and inflation
- The inability of monetary policy to stabilize the economy on a short-term basis

If we agree with Meyer's definition then Woodford's Neo-Wicksellianism matches two of the three proposed Monetarist features. Is this sufficient to label Woodford under the flag of Monetarism? If not, is Woodford at the origin of a new form of *moneyless* Monetarism? I think that the most interesting aspect thing does not lie in where Woodford should be classified among the macro family tree. In my mind, what really matters is what emerges from this debate concerning the structural features of Monetarism and its consequences for the conduct of monetary policy.

### The *De-emphasis* of the Monetary Aggregates

Woodford was not blind to Nelson's criticisms and he answered him in 2006 in an

article entitled « *How important is Money in the Conduct of Monetary Policy* ». Woodford coped with the relevance of a money-demand function by integrating it within his basic model. Such an addition did not change the final conclusion on the evolution of the endogenous variables (inflation, output and interest rates).<sup>24</sup> Paradoxically, Woodford reacted to his supposed *anti-monetarist* approach by leaving the doors open to a possible monetarist filiation: « *The model is not the one that requires the existence of a money-demand-relation [...] but not one that is incompatible with the existence of such relation. It is thus incorrect to claim [...] that models like the one set out above "reject" the quantity theory of money, and can accordingly be dismissed in light of the empirical support for that approach* » (Woodford, 2006, p. 15).

Judging from this, it would seem that Monetarism is not totally *buried*. Woodford's approach does not appear to be incompatible with several monetarist precepts. In his answer to Nelson's critics, Woodford gives his own definition of Monetarism. Woodford retains three features:

- (1) the central bank is responsible for controlling inflation;<sup>25</sup>  
the *Commitment* is superior over *discretion*;
- (2) Friedman's famous money growth rule is only one example among many of possible monetary rules such as Taylor's.

24 For a time purpose, we will not explain Woodford's answer regarding his neglect of the money demand within his framework. We advise the reader to see Woodford (2006, p.14-15).

25 At that time, Wicksell already considered that central bank should be held responsible for the level of prices (Wicksell, 1936 (1898); 1935 (1906)).

The most interesting point is that Woodford supports –in line with Nelson– that the usefulness of monetary aggregates for monetary policy is not *the* feature which helps us to judge on a possible filiation between his approach and Monetarism. In Woodford’s own words: “*in neither case does the preservation of the important insights obtained from the monetarist controversy depend on continuing to emphasize monetary aggregate in policy deliberations.*” (Woodford, 2006, p. 4).

It is crystal clear that money does not appear explicitly in Woodford’s model. As stated above, however, the lack of explicit terms for money –in the IS equation– does not allow us to conclude that Monetarism is rejected and that money does not matter. There are other channels of transmission for monetary policy that can be considered. There is a ground for money in Woodford’s model via the intertemporal IS equation. As shown by Nelson (2003, p. 1048) himself the “*forward looking property of aggregate demand (IS curve) allows a potentially important role for money as an indicator of economic conditions.*”

According to this debate, it seems that Woodford was at the origin of a new form of Monetarism which would be a *Monetarism without money explicitly*. Money should be viewed via the interest rate in the structural relationships of the model. Contrary to what was always underlined within Monetarism, money, via monetary aggregates, is not *the* feature. This is the

message that emerges from the Woodford vs Neo-monetarist debate. All of that shows us that the structural relationships –or features– in economics are changing.

#### IV. Conclusion

It is commonplace to read that monetary policymaking is more of an *art* than a *science* (Blinder, 1997; Mishkin, 2007).<sup>26</sup> If monetary policy became an art, it is without any doubt the art of managing expectations. During a conference on the theme “Central Banks as Economic Institutions”, Prof. Eichengreen said that “*Monetary policy is not doing something but it is telling something*”. If we accept such a definition, it is clear that the challenge of credibility becomes of primary importance for central banks and hence the theory of monetary policy should take this into account. It is therefore not surprising if the emphasis should be put on the means of managing expectations. Since the lessons learned due to the Fisher effect, central banks have shaped and anchored expectations through their monthly (in the ECB case) communication reports. The monetary rule –as a monetary instrument– is a relevant tool to communicate and *tell stories* to the public.

Woodford’s *Interest and Prices* should be understood in such a context. The goal was to provide foundations to a theory of monetary policy. Logically Woodford emphasizes the forward looking property

26 The exact quotation is the following: “*Having looked at monetary policy from both sides now, I can testify that central banking is as much art as science. Nonetheless, while practicing this dark art, I have always found science quite useful*” (Blinder, 1997, p. 17).

of the key structural relationships. We can not deny that monetary policy theory highlights the necessity for an interest rate regulation inherited from Wicksell's first monetary works. Thus Wicksellian tendency is at the origin of both a theoretical and practical debate concerning the usefulness of monetary aggregates for policy deliberations.

Throughout this article, we have seen that:

- A new step has been reached with New Keynesian models in general—and with Woodford's model in particular— by neglecting money within the monetary policy framework used by policymakers. Explicitly money is absent among the relevant variables to which monetary policy should respond.

- All the structural relationships in Woodford's model are determined—more or less directly—by the operating instrument—the nominal overnight interest rate— of the central bank. In Woodford's universe the short-term interest rate renders implicitly the impact that money plays for overall economic stability. On the other hand, the emphasis put on the nominal interest rate as the key variable for economic stability allows us to conclude that money, as such, has not been abandoned.

Finally, we can make the analogy with Friedman's famous statement by saying that *inflation* in the Woodfordian framework *is always and everywhere an expectational phenomenon*.

## References

- BELLET M, Gloria-Palermo S., Zouache A. (eds) (2004), *Evolution of the Market Process. Austrian and Swedish Economics*, Routledge
- BERGER H, de Haan J, STURM J.E (2006), "Does Money Matter in the ECB Strategy? New Evidence Based on ECB Communication", *Swiss Institute for Business Cycle Research (KOF) Working Paper* N°125, January, available at SSRN: <http://ssrn.com/abstract=881555>
- BLINDER A. (1997), "What Central Bankers can learn from Academics and vice-versa", *Journal of Economic Perspectives*, 11, pp. 3-19.
- BOIANOVSKY M. (2006), "Woodford's Interest and Prices from The Perspective of the History and Methodology of economic Thought: A Mini Symposium", *Journal of the History of Economic Thought*, Vol.28, N°2, june, pp. 139-142.
- MC CALLUM B. (2005), "Michael Woodford's "Interest and Prices": A review article", Working Paper, available at <http://economics.uwo.ca/conference/monetaryeconomics05/monetaryeconomicsprogram05.html>
- FRIEDMAN M. (1972), "Comments on the Critics", *Journal of Political Economy*, Vol. 80, N°5, september, pp. 906-950.

- GOODFRIEND M. and King R. (1997), "The New Neoclassical Synthesis and the Role of Monetary Policy", *NBER Macroeconomics Annual*, MIT Press.
- GOODHART C. (2005), *The foundations of Macroeconomics: Theoretical rigour versus empirical realism?*, IRES Conference on the "History of Macroeconomics".
- GREEN E. (2005), "A Review of "Interest and Prices": Foundations of a Theory of Monetary Policy by Michael Woodford", *Journal of Economic Literature XLIII*, pp. 121-134.
- LAILDLER D. (2007), "Financial Stability, Monetarism and the Wicksell Connection", *EPRI Worker Paper Series* N°3, october, available at <http://economics.uwo.ca/centres/epri>.
- \_\_\_\_\_ (2005), *Theoretical Foundations for Monetary Policy*, Bank of Finland Conference on "Open-Market Operations and the Financial Markets".
- \_\_\_\_\_ (2004), "Woodford and Wicksell on "Interest and Prices": the Place of Pure Credit Economy in a Theory of Monetary Policy", *EPRI- Working Paper Series* N°5, october, Available at <http://economics.uwo.ca/centres/epri>
- LAVOIE M, Seccareccia M. (ed) (2004), *Central banking in the modern World*, Edward Elgar.
- MEYER L. (2001), "Does Money Matter?", *Federal Reserve Bank of St Louis Review*, september/ october, Vol. 83, No. 5, pp. 1-16.
- MISHKIN, Frederic S. (2007), "Will Monetary Policy Become More of a Science?", *NBER Working Paper* N° W13566, October, available at SSRN: <http://ssrn.com/abstract=1024980>
- MITZEN P. (eds) (2003), *Central Banking, Monetary Policy and Practice Essays in honour of Charles Goodhart*, Vol.1, Edward Elgar.
- NAKAJIMA T. (2005), Book Review "Interest and Prices": Foundations of a Theory of Monetary Policy, by Woodford, *Economic Journal*, Vol. 115, february, 134-136, available at SSRN: <http://ssrn.com/abstract=654834>.
- NELSON E. (2003), "The Future of Monetary Aggregates in Monetary Policy Analysis", *Journal of Monetary Economics* 50, pp. 1029-1059.
- OHLIN B. (1926), "Knut Wicksell (1851-1926)" [Obituary], *Economic Journal* 36, 503-512.
- TAMBORINI, R. (2006), "Back to Wicksell? In search of the foundations of practical monetary policy," *Department of Economics Working Papers* 0602, Department of Economics, University of Trento, Italia.
- TRAUTWEIN H-M. (with Boianovsky M.) (2005), "The New Neoclassical Synthesis: A Wicksellian Renaissance ?", *Working Paper*.
- TRAUTWEIN H-M and BOIANOVSKY M. (2001), "An Early Manuscript by Knut Wicksell on the Bank Rate of Interest", *History of Political Economy* - 33- 3, Fall 2001, p. 485-507.

- WICKSELL K., 1936 (1898), *Interest and Prices: A study of the Causes Regulating the Value of Money*, Macmillian & Co.
- \_\_\_\_\_ 1935 (1906), *Lectures on Political Economy*. Vol. 2, *Money*, Routledge & Kegan Paul LTD.
- \_\_\_\_\_ (1907), "The influence of the Rate of Interest on Prices", *Economic Journal* XVII, pp. 213-220.
- WOODFORD M. (1999), "Revolution and Evolution in Twentieth Century Macroeconomics", *Working Paper Presented at a conference "Frontiers of the Mind in the Twenty-First Century"*, U.S. Library of Congress, Washington, D.C., June, available at Woodford Personal homepage: <http://www.columbia.edu/~mw2230/>
- \_\_\_\_\_ (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press.
- \_\_\_\_\_ (2006), "How Important is Money in the Conduct of Monetary Policy", *Working Paper*, available at Woodford Personal homepage: <http://www.columbia.edu/~mw2230/>
- ZOUACHE A. (2004), Towards a New Neoclassical Synthesis? *History of Economic Ideas* XII: 1, pp. 95-117.
- ZOUACHE A. (with Trautwein H-M) (2005), *Natural Interest Rate in Old and New Wicksellian Frameworks*, ESHET Annual Conference.