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IS THE NAIRU THEORY A MONETARIST, NEW KEYNESIAN, POST KEYNESIAN OR A MARXIST THEORY?

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Abstract

The NAIRU theory has become the mainstream theory in explaining unemployment in Europe and is often used to justify demands for a cutback of the welfare state, reducing unemployment benefits, reducing minimum wages, decentralizing collective bargaining etc. Close inspection reveals that it nonetheless shares some arguments with Post Keynesian and even Marxist theory. The paper proposes an underdetermined, encompassing NAIRU model, which is consistent with several theoretical tradtions. Depending on the closure with respect to demand formation and determination of the NAIRU itself, the model allows for New Keynesian, Post Keynesian and Marxist results.

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Is the NAIRU theory a Monetarist, New Keynesian, Post Keynesian or a Marxist theory?

The question this paper poses in its title may sound odd at first. Isn't it clear what sort of theory the NAIRU is? No lesser authorities than L. Ball and G. Mankiw assure us that "the NAIRU is approximately a synonym for the natural rate of unemployment" (Ball and Mankiw 2002, 115). And equally authoritative from the other political spectrum S. de Brunhoff, a senior Marxist monetary theoretician rejects the NAIRU since the "NAIRU would appear to be a statistics-dominated instrument of wage supervision, to be used by those who fear that low unemployment might undermine wage moderation." (de Brunhoff 2005, 216) Somewhat less in line with conventional wisdome R Pollin argues that "Marx and Kalecki also share a common conclusion with natural rate proponents, in that they would all agree that positive unemployment rates are the outgrowth of class struggle over distribution of income and political power." (Pollin 1998, 5f). Moreover, de Brunhoff argues that "The NAIRU model was developed by Post Keynesian economists." (de Brunhoff 2005, 216) and implicates P. Davidson in the crime scene. Davidson himself however seeks to "provide a Post Keynesian explanation fo persistent high unemployment rates experienced by OECD nations since 1973. (…) so that the reader can comprehend why this explanation differs from that of NAIRU proponents" (Davidson 1998, 818), which would certainly suggest that the NAIRU is at odds with the Post Keynesian theory. Overall, it is certainyl fair to say that there is need for a clarification of the theoretical foudnation of the NAIRU.

At the core of the NAIRU theory is the claim that at any point in time there is a rate of unemployment at which inflation is constant. Many, if not most, economists would nowadays agree with this assertion, however this does not prevent them from disagreeing about the theoretical interpretation of this relation, its theoretical foundation and its policy implications. This paper will argue that the NAIRU theory is an interesting theoretical hybrid and that it can be given Marxian, Post Keynesian and New Keynesian interpretations. However the Monetarist natural rate of unemployment should not be confused with the NAIRU, since the former is a theory of voluntary unemployment. The task of this paper is to identify the differences in interpretation. To do so, a core NAIRU model will be proposed and alternative closures for the respective theories will suggested. By design thus we will try to keep things as simple as possible to clarify the key differences. Two areas of difference are identified. First, the demand function. Here the question is what the effect of inflation on output is and

what the effect of a change in the wage share on output is whether NAIRU is a strong attractor for actual unemployment. Second, the determination of the NAIRU. Here the question is how the NAIRU is determined, in particular whether it is exogenous or not.

A few clarifications regarding the scope of the paper is in place. By design we will try to keep things simple and comparable. This implies that several sophistications that are important and ideosyncratic to a theory will have to be brushed aside. Among these, three issues stand out. First, empirical research in the New Keynesian tradition has recently highlighted the role of interactions between demand shocks, supply shocks and labor market institutions (E.g. Blanchard and Wolfers 2000). While potentially empirically important, a treatment of various interaction effects for all the theories discussed here is well beyond the scope of the paper. Second, several Post Keynesian authors have argued that there are non-linearities in the relation between unemployment and prices. We will assume standard linear relations throughout the paper. Introducing non-linearities will not invalidate the different mechanisms highlighted in this paper.

Third this paper will be based on an equilibrium framework. Many Post Keynesians and most Marxists would feel that this framework is inappropriate to capture their respective arguments. And rightly so. Argueably neither Marx nor Keynes conceptualized the economic processes as moving smoothly from one well defined equilibrium to another. The use of a standard comparative statics framework, thus fails to do justice to each theory, but it will help highlight the difference between the theories. In doing so, necessarily, other important differences, here dynamics, are ignored.

The paper is structured as follows. Section one presents the core model and distinguishes between the NAIRU theory and the NAIRU story of European unemployment. Section two explores whether the Monetarist natural rate of unemployment is indeed similar to the NAIRU. Section three presents the New Keynesian NAIRU theory and highlight the ambiguous role of hysteresis in this theory. In section four a Post Keynesian approach based on the so-called conflict inflation is presented as well as the more genuine role for hysteresis. Section five discusses Marxian theory and its ambivalent position with respect to the NAIRU. Section six concludes.

A NAIRU reference model

Table 1 summarizes a NAIRU reference model for a closed economy. Nominal wages are set in a bargaining process. Workers' bargaining position and thus wage claims (equation 1) depend on various exogenous factors and negatively on the rate of unemployment. This is also often called the wage setting curve. The precise interpretation of this relation as well as the determinants of exogenous factors influencing wage claims will differ according to theory.

INSERT TABLE 1 about here

Firms have the ability to influence prices and set prices by charging a mark up on production costs. The (intended) mark up is determined exogenously (eq. 2). It is assumed that capitalists as well as workers are imperfectly able to protect themselves against unexpected inflation. Actual wage and profit shares (eq. 3 and 4) thus depend on unanticipated inflation. At first it may appear counterintuitive to have the actual profit share being affected by unanticipated inflation, after all in the NAIRU theories to be discussed, it is assumed that firms do have market power and thus *set* prices. However, a large body of theoretical and empirical work suggests that prices sticky and inflation is persistent. The implication of this of course is that in many cases wage and cost increases will not be fully passed on to prices. Indeed, the model presented here is a simplified version of a fully fledged model, which would distinguish between wage inflation and price inflation (see various papers by Flaschel). We avoid this complication because this would contribute little to the understanding of the difference of the theories to be discussed. The distributional effects of this inflation depend on the speed and frequency with which wages and prices are adjusted.

Following standard practice we assume throughout the paper that people form adaptive expectations about price inflation (eq. 6). The assumption is made for convenience. The difference between the theories discussed does not lie in different assumptions about the formation of expectations. As second convenient auxiliary assumption is an employment function according to which unemployment depends on output (7). This is an Okun's Law-type relation that is written in levels rather than differences.

From the above equations we can derive the familiar expectations-augmented Phillips curve:

$$\Delta p = [\boldsymbol{p}_0 - 1 + w_0]/(\boldsymbol{p}_2 + w_2) - w_1 u/(\boldsymbol{p}_2 + w_2) \,. \tag{10}$$

In the following the version of the Phillips curve that will be used is the follwing:

$$p_t = p_{t-1} + [\boldsymbol{p}_0 - 1 + w_0]/(\boldsymbol{p}_2 + w_2) - w_1 n/(\boldsymbol{p}_2 + w_2) + w_1 y/(\boldsymbol{p}_2 + w_2) \tag{11}$$

Alternatively we can solve for unemployment:

$$u(y) = u_N - (\boldsymbol{p}_2 + w_2)\Delta p / w_1 \,, \tag{12}$$

$$\text{where } u_N = (\boldsymbol{p}_0 + w_0 - 1)/ w_1$$

The empirical interpretation of the NAIRU model can focus either on the explanation of inflation or on the explanation of unemployment. It seems that in the USA the NAIRU model is implicitly interpreted as a theory of inflation. Most authors criticize or defend the NAIRU model based on its ability to explain the development of inflation (Gordon 1997, Staiger et al 1997). In Europe, on the other hand, the NAIRU is understood as a theory that ought to be able to explain unemployment ex ante, i.e. exogenous variables that supposedly determine the NAIRU also ought to explain actual unemployment. In other words, in the USA the NAIRU is mostly interpreted from the point of view of a central banker, but in Europe from the view point of a labor market reformer.

The model is not closed yet, since nothing has been said about demand formation and about the evolution of the NAIRU over time. This paper will propose two equations, the demand closure (eq. 8) and the NAIRU closure (9). It will be argued that substantial differences in interpretation and terminology exist between the Monetarist, New Keynesians, Post Keynesian and Marxist theories, but different specifications of these two equations go a long way in illustrating these differences, while leaving equations (1) to (7) unchanged.

The NAIRU *theory* and the NAIRU *story*

The NAIRU theory is, in Europe, associated with a particular explanation of unemployment. Before we proceed with the theoretical discussion a digression on policy implications is necessary. We will distinguish carefully between the NAIRU *model* and the NAIRU *story*

regarding European unemployment. The NAIRU *model*, outlined above, is understood as a general model of output, employment and inflation that allows for inflation resulting from conflicting income claims. Such models imply that at any point in time there will exist an inflation barrier, the NAIRU, such that if demand took unemployment below that barrier then inflation would tend to rise. The NAIRU *story* is understood as a specific interpretation of the model. It involves two claims. First that the NAIRU is determined exogenously by labor market institutions, which are mostly subject to policy. Second that changes in the NAIRU in a strong sense of the word cause changes in actual unemployment (rather than vice versa or a third variable affecting both). Consequently the NAIRU serves as a strong attractor for actual unemployment. The NAIRU story thus claims that the rise of unemployment in Europe is due to labor market inflexibility: changes in the NAIRU over the past decades have been due to wage-push factors conveniently summarized as overgenerous welfare states.

The natural rate of unemployment - a monetarist NAIRU?

Friedman (1969) and Phelps (1968) laid the cornerstone for the later discussions of the NAIRU by proposing the long-run vertical Phillips Curve. Friedman famously baptized the unemployment rate at which inflation would be constant the "natural rate of unemployment". Some, mostly American, economists do maintain that "the NAIRU is approximately a synonym for the natural rate of unemployment" (Ball and Mankiw 2002, 115). It will be argued that this is at best misleading.

Friedman's famous (1968) paper does not offer a rigorous analysis. Rather he asserts that, given certain frictions, the Walrasian system will ground out an equilibrium rate of unemployment, labelled the natural rate of unemployment in analogy to Wicksell's natural rate of interest. Friedman's definition of the natural rate as well as the description of the forces that will push actual unemployment towards its natural level are cryptic.

> "At any moment in time there is some level of unemployment which has the property that it is consistent with equilibrium in the structure of real wages … The 'natural rate of unemployment' … is the level that would be ground out by the Walrasian system of general equilibrium equations, provided that there is embedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the costs of gathering information about job vacancies, and labor availabilities, the costs of mobility and so on." (Friedman 1968, p. 8)

Asserting that the economy does gravitate to the NRU, Friedman goes on to explain that attempts to influence unemployment will result only in higher inflation. People's inflationary expectations will be based on past inflation rates. Unexpected inflation can thus increase the labour supply in the short run and therefore output, but once people realize that inflation is higher than expected, real variables, including the rate of unemployment, will return to their equilibrium level and prices will increase.

In his Nobel Lecture Friedman (1977) elaborates further. A nominal demand shock that is not properly understood by firms and workers may be misinterpreted due to rising sectoral prices. Thus workers may offer more labor since they believe that real wages have increased, whereas in fact only nominal wages have. Firms may hire more workers because they think the real product wage (i.e. deflated by sectoral prices) has fallen. Unemployment increases because workers quit and searching for new, better paying jobs. Unemployment in Friedmann's theory is search unemployment. Overall, the changes in employment happen because of misperceptions of workers and firms.

Thus instead of (12) the relation between unemployment and inflation should rather be written as:

$$u = (\boldsymbol{p}_0 + w_0 - 1)/w_1 - \Delta p(y)(\boldsymbol{p}_2 + w_2)/w_1 \tag{12'}$$

Here inflation is a function of the demand shock and because of price misperceptions unemployment reacts. In the Monetarist argument prices change before or simultaneously with quantities and employment. Note that if prices were slow in adjusting, there would be no reason for workers or firms to adjust their employment decisions. Curiously this is not how modern central banks think that monetary policy is operating. Ehrbar et al (2003) in a summary of the ECB's Euroarea study on monetary policy argues that changes in monetary policy are quick in affecting output, but slow in affecting prices.

The demand closure of Monetarists is a standard Pigou or Keynes effect: inflation will negatively affect demand ($y_2 < 0$),given a certain supply of money. The effect of income distribution on demand is neglected ($y_3 = 0$). The Monetarist demand closure thus becomes:

$$y = y_0 + y_2 (m - p) \tag{13.Mo}$$

where *m* is the growth rate of the money supply (set by the Central Bank)

As to the NAIRU closure Friedman agues that the NRU is given exogenously. Friedman (1977) mentions two factors that will empirically be important in determining the NRU: demographics and unemployment. The demographic structure matters because different age groups have different rates of mobility (and mobility by assumption implies spells of unemployment). Unemployment benefits matter because they encourage workers to search for jobs longer. More generally he argues that the NRU depends on real as opposed to monetary factors (Friedman 1977, 458). There is no indication that the NRU would depend on actual unemployment (thus $g = 0$), indeed demand shocks for Friedman are monetary shocks. Equation (14) therefore vanishes and NRU is determined exogenously. Thus second Monetarist closure becomes:

$$u_N = f(d, \Lambda) \qquad\qquad\qquad 14.\text{Mo}$$

where *d* denotes the demographic structure and Λ various relevant labor market institutions.

Figure 1 summarizes the Monetarist argument. In the (p, 1-u) space the Phillips curve (PC) has a positive slope and the demand function (u^{IS}) a negative slope. Actual unemployment will only deviate form the NRU if there is unexpected inflation. Due to adaptive expectations the PC-curve will shift upwards the next period such that actual unemployment will approach the NRU. The ensuring equilibrium is thus stable and, since the NRU was assumed to be exogenous, the NRU serves as an attractor for actual unemployment.

insert FIGURE 1 about here

How similar is the NRU to the NAIRU? While the NRU concept does lead to similar policy conclusions as the NAIRU theory and, indeed, the two are often conflated, as witnessed by Ball and Mankiw 2002,[1] there are important differences in the theoretical foundation. NRU is still founded on a Walrasian competitive markets. Snowdon, Vane and Wynarczyk point out:

> "The crucial difference between these concepts relates to their micro foundations. Friedman's natural rate is a market-clearing concept, whereas the NAIRU is the rate of

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[1] One other remarkable example of such a conflation is Blanchard's Macroeconomics textbook.

unemployment which generates consistency between the target real wage of workers and the feasible real wage determined by labour productivity and the size of a firm's mark up. Since the NAIRU is determined by the balance of power between workers and firms, the micro foundations of the NAIRU relate theories of imperfect competition in the labour and production markets." (Snowdon, Vane and Wynarczyk 1994, 323).

On the labour market a competitive labor demand function and a labor supply curve that can be derived from individual income leisure trade off interact. The NAIRU model, on the other hand, is founded on bargaining models, i.e. there is an intrinsic conflict of interest between workers and firms that is mediated not by the market but by a bargaining process.[2] The key difference conceptually is that in Friedman's NRU is a theory of *voluntary* unemployment. The NAIRU model, as understood in this paper, is a theory of *involuntary* unemployment.[3] Therefore we conclude that, despite similarities in the policy conclusion, the Monetarist NRU is a distinct theory and not a variant of the NAIRU theory.

The New Keynesian NAIRU

New Keynesian (NK) theory maintains the perfectly competitive labor market as a reference system, but situates the actual analysis in an imperfect competition framework. New Keynesians pride themselves in being able in providing microfoundations for their models. What is labeled "wage claims function" here is usually called the "wage setting function", and is interpreted as the outcome of the bargaining process between labor and capital. Our profit claims function is called price setting function and is interpreted as the price setting behavior by a firm with market power. Consequently, the target profit claims, in this interpretation, depend solely on the market power of the firm (as measured by the demand elasticity faced by the firm, since the latter is assumed to be profit maximizing). Moreover, in empirical research it is usually assumed constant (e.g. Nickell 1997, 1998).

Equations 1 to 7 would be acceptable to New Keynesians without substantial modifcaitons. Indeed this set of equations has been inspired by Nickell (1998). Thus we only need to investigate the demand closure and the NAIRU closure.

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[2] Carlin and Soskice 1990 make a similar point.
[3] This is another important difference in the interpretation of the NAIRU on the two sides of the Atlantic. While hardly any economist in Europe would associate the NAIRU with voluntary unemployment, many in the USA do.

There are two versions of the New Keynesian demand closure. The first is a reproduction of the Monetarist price effect. Layard, Nickell and Jackman (1991) and Nickell (1998) for example follow this path. However, few economists, certainly few Central Bankers, these days believe that the money supply is given exogenously or can be controlled by the Central Bank. The more genuine and up to date New Keynesian closure does not rely on real balance effects of various sorts, but on central bank behavior. Based on a Taylor Rule, it is presumed that Central Banks increase interest rates if inflation exceed their target inflation (eq. 15).[4] Effects of income distribution on demand are ignored ($y_3=0$). The NK demand closure thus is:

$$y^{IS} = y_0 + y_2(i - p) \text{ with } y_2 < 0 \qquad\qquad 13.\text{NK}$$

and the Central Bank's reaction function is

$$i - p = i_0 + i_2(p - t) \qquad\qquad (15)$$

The IS curve including central bank behavior then becomes

$$y^{IS-CB} = y_0 + y_2 i_0 - y_2 i_2 t + y_2 i_2 p \qquad\qquad (16)$$

The NAIRU in the New Keynesian interpretation depends on labor market institutions that determine wage claims (the so-called wage push factors) and on the market power of firms. In empirical research, however, the latter are routinely ignored. For practical purposes thus the target wage share and consequently the NAIRU is thought of depending on exogenous labor market institutions, in particular welfare state characteristics, in particular the level of minimum wages, the level and duration of unemployment benefits etc. In combination with a given market power of firms, the NAIRU is thus assumed to be determined exogenously. Like with Monetarists $g = 0$ and (9) vanishes. Instead we get:

$$u_N = f(\Lambda) \qquad\qquad 9.\text{NK}$$

While 9.NK may look similar to 9.Mo, its interpretation is quite different. Whereas in the Monetarist version higher unemployment benefits increase the duration of unemployment of

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[4] Empirical Taylor rules also include a term for the output gap. This complication is ignored here. And indeed with the assumed employment function (7) this would not be very interesting. These second type of New Keynesian NAIRU models have also become known as New Consensus models (Romer 2004) and recently been subject to critique by Post Keynesians (Arestis and Sawyer 2002, Kreisler and Lavoie 2004).

the people searching for jobs, in the NK version the unemployment benefits increase the bargaining power of the workers who have a job and pushes up their wage demands. Therefore involuntary unemployment will arise because of wages being "too high".

We are now in a position to discuss the properties of the New Keynesian NAIRU model. *In the short run*, effective demand determines actual unemployment and as a consequence unanticipated inflation. To be more precise: demand determines the deviation of actual unemployment from equilibrium unemployment. Unemployment then is a function of fiscal and monetary policy (y_0) and changes in the price level (10) result. In the short run, the system therefore has Keynesian features, but only because of the difference between expected and actual prices.

Since their expectations have been frustrated in the short run, people will alter their behavior and adjust expectations to the higher price level. For equilibrium *in the long run*, expectations have to be fulfilled (*?p=0*), and income claims are thus equilibrated through the rate of unemployment. There will be only one level of unemployment that renders income claims of workers (w_0) and capitalists (p_0) consistent. Any attempt by fiscal or monetary policy to move unemployment away from this equilibrium level is doomed. In the long run the NAIRU depends on wage push factors and the mark up, but not autonomous demand. In the long run the model thus has neoclassical features, but a non-clearing labour market.

This is summarized in Figure 2. Compared with Figure 1 there are two demand curves. u^{IS} (based on 13.NK), which is the level of employment for a given interest rate and u^{IS-CB} (based on 16) incorporates the CB reaction function and has a negative slope. In case u is below u_N there will be an increase in inflation. In the next period the PC will thus shift upwards. With a stable reaction function the system is stable and the NIARU serves as an attractor for actual unemployment.

Insert FIGURE 2 about here

From the NK NAIRU model to the NAIRU story

The New Keynesian interpretation of the NAIRU therefore replicates on important feature of the Neoclassical Synthesis: the short run (Keynesian) – long run (Classical) dichotomy.

Finally, we turn to the policy conclusions and see how the NK model turns into the NAIRU story. The standard NAIRU *story* of European unemployment is that wage push factors (w_0), mostly welfare state related, caused unemployment. Wage inflexibility is due to labor market rigidities that empowered insiders has caused a rise in the NAIRU (Krugman 1994, Siebert 1997). Among the most frequently cited causes for unemployment are long and durable unemployment benefits, job protection measures, high social security contributions (or more generally: the tax wedge), and strong unions. This explanation, i.e. a change in w_0 within the NAIRU model, leads to an increase in the rate of unemployment, with the mark up being constant.[5] The policy recommendations of this explanation are straightforward: since rigid labor markets and overgenerous welfare states have caused the problem, labor markets have to be deregulated and welfare states curbed. The OECD does therefore recommend in a series of publications ("Implementing the OECD Jobs Strategy") the easing of employment protection, reducing the level and duration of unemployment benefits, and decentralizing wage bargaining.

Note that what we call the NAIRU story is really an interpretation of the NK NAIRU model. The NAIRU story does not follow automatically from the NK interpretation of the NAIRU, since the former involves an empirical claim: that labor market institutions have in fact changed in the alleged direction and strong enough so as to raise the NAIRU substantially. Neither of this claims is supported unanimously by the empirical literature (Madsen 1998, Ball 1999, Stockhammer 2004a, various contributions in Howell 2005)

Unemployment hysteresis

Many NK models take into account unemployment persistence. This is a delicate task since unemployment hysteresis has the potential to undermine key policy conclusions of the NAIRU story. If today's unemployment depends on past unemployment then the effectiveness of economic policy in fighting unemployment increases. The NAIRU itself may become an endogenous variable and follow where actual unemployment takes it (Blanchard

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[5] This, however, is at odds with the stylized facts of European unemployment. Over the long run we do observe a rise in the rate of unemployment and in the profit share (Blanchard 1997, Stockhammer 2004c Chap. 1).

and Summers 1988), in our notation $g > 0$. Indeed, within New Keynesians there is disagreement on the question how fundamental the effect of hysteresis is. Whereas Layard, Nickell and Jackman (1991) regard it as a minor modification to the model, Ball (1999) argues that differences in monetary policy explain most of the differences in unemployment rates across countries.

In the NK version unemployment persistence is usually (Layard, Nickell and Jackman (1991) modeled in the following way. Wage demand depend on a weighted average of current and past unemployment rather than on current unemployment alone. Thus:

$$(1-\boldsymbol{p})^W = w_0 - w_1\left(u_t - hu_{t-1}\right) \qquad\qquad (1')$$

where $0 < h < 1$ is a measure for unemployment persistence. The mechanism through which unemployment persistence becomes effective is that current and past unemployment affect wage bargaining differently. The justifications for this differ. Frequently cited causes are insider bargaining (insiders care more about the employed than about the unemployed) and deskilling (the unemployed loose skills while unemployed and thus cannot compete with the employed).

Only in the extreme case of full hysteresis (*h=1*), will demand determine the change in unemployment.

$$\Delta u = \left[\boldsymbol{p}_0 + w_0 - 1 - (\boldsymbol{p}_2 + w_2)\Delta p\right]/w_1$$

Inflation can be stable at any point with stable unemployment. In other words the NAIRU will be dragged along with actual unemployment and ceases to play an independent role.

However the above requires that long term unemployed exercise no downward pressure on wages whatsoever, an assumption which few economists are willing to make. Thus usually unemployment partial persistence (*0 < h < 1*) thought to be more realistic. In the short run unemployment will then not only depend on the NAIRU and unexpected inflation, but also on past unemployment.

$$u_t = u_N - (\boldsymbol{p}_2 + w_2)\Delta p / w_1 + w_2 hu_{t-1} / w_1$$

But in the long run, here $\Delta p = 0$ and $u_t = u_{t-1}$, unemployment will depend only on the exogenous factors that determine the NAIRU. The expression for the NAIRU then changes somewhat:

$$u^{LR} = u_N w_1 / (w_1 - w_2 h) = (\mathbf{p}_0 + w_0 - 1)/(w_1 - w_2 h)$$

Thus unemployment persistence in the case of less than full hysteresis is merely a case of low wage flexibility (with respect to unemployment) and will increase unemployment in the long run. However, it does not affect the long run properties of the NK NAIRU model. However, for NKs with a genuine interest in short run development it can provide a reason to argue for government demand management.

Post Keynesian NAIRU

Post Keynesian reactions to the NAIRU

The NK-NAIRU theory lends itself to policy recommendations that are in line with standard neoclassical prescriptions. Labour market reforms, not demand policy, is what is needed to combat unemployment. The NAIRU story, correspondingly, argues that it has been wrong-headed labour market reforms that led to labour market inflexibility and thus caused the rise in European unemployment. Of course there have been Post Keynesian reactions to this explanation, but these reactions have been far less unified than the NK-NAIRU approach and range from outright rejection of the NAIRU to extending the NAIRU model.

One of the main causes for the diversity in Post Keynesian reactions to the NAIRU model is that some of its arguments, in particular the role of distributional conflict in explaining inflation are also part of the Post Keynesian repertoire. Thus in the following a variety of Keynesian approaches is presented.

Davidson (1998) offers a Post Keynesian critique of the NAIRU approach. Emphasizing the pivotal role of uncertainty in a monetary production economy he insists that no labour demand curve, nor its present incarnation in the form of the price setting curve, can be drawn without an assumption about effective demand, because the notion of the marginal product of labour or the marginal revenue product of labour that underlies the price setting curve does

not exist prior to the level of effective demand. The labour demand curve therefore depends on the level of effective demand, which in turn is crucially determined by government expenditure and investment. Wage decreases can therefore not bring about an increase in employment unless they increase effective demand. Davidson's contribution constitutes a clear Keynesian rebuttal of the NAIRU story, however it remains unsatisfactory because he seems to miss the difference between a standard labour supply curve and the wage setting curve.

Pollin (1998) can be regarded as the complement to Davidson in that he discusses the wage setting curve, but remains silent on the price setting curve. Pollin draws attention to the parallels in the NAIRU bargaining model and a Marx-Kalecki theory of income distribution and the reserve army: "In my view, Marx and Kalecki also share a common conclusion with natural rate proponents, in that they would all agree that positive unemployment rates are the outgrowth of class struggle over distribution of income and political power." And he goes on: "Of course, Friedman and the New Classicals reach this conclusion via analytic and political perspectives that are diametrically opposite to those of Marx and Kalecki. To put it in a nutshell, mass unemployment results in the Friedmanite/New Classical view when workers demand more than they deserve, while for Marx and Kalecki, capitalists use the weapon of unemployment to prevent workers from getting their just due." (Pollin 1998, 5f)

Pollin hardly addresses the issue of effective demand or its negation. Davidson and Polling cover the extreme poles of the reactions of Post Keynesians to the NAIRU theory: harsh criticism of its neglect of demand and approval of its emphasis on distributional conflict. Similar arguments regarding the role of unemployment and distributional conflict in the determination of inflation had been made much earlier by Post Keynesians under the name of conflict inflation.

Conflict inflation[6]

Davidson probably underestimates the innovative potential of the NAIRU theory and how far it has moved from the classical model that Keynes had criticized. As a theory of inflation the NAIRU model resembles the conflict inflation theory of Post Keynesian origin. This theory,

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[6]   See Rowthorn (1977), Lavoie (1992), and Palley (1996) as examples.

was formally developed in the 1970s and 80s, but was already contained in the early writings of J. Robinson (1937) and reflects Post Keynesians long-standing conviction that inflation is the outcome of distributional conflict (and not excessive growth in the money supply) and thus has to be combated through incomes policies (Rochon 1999, King 2002).

Conflict inflation theory takes as its point of departure income claims of labour and capital, though the model can obviously be extended to include the state and a foreign sector. If the income claims of labour and capital exceed national income, the income claims are inconsistent and inflation will result such as to reconcile income claims nominally.

The income claims depend on the respective power position, which will depend on various exogenous factors (strength and militancy of labour unions; market power of firms) and demand. For workers a lower level of effective demand results in higher unemployment, for firms it implies lower capacity utilization. Thus a lower level of demand weakens the bargaining position of either side and thus will lead to lower inflation. Inflation in this theory is thus not a monetary phenomenon in the sense of the quantity theory of money, but a real phenomenon, resulting from the distributional conflict between capital and labour.

Such a model will exhibit a rate of unemployment at which inflation is constant, because at this rate of unemployment workers are weakened sufficiently to accept capitalists' income claims. Thus the model exhibits a NAIRU. However, the similarities between the conflict inflation model and the NAIRU theory are rarely discussed explicitly. Most proponents of the conflict inflation model (e.g. M. Lavoie) regard it as a theory of inflation rather than unemployment. [7]

A Post Keynesian NAIRU model

Post Keynesians usually embrace the inflation part of the NAIRU model, that is conflict inflation, but do not share the labor market part of the New Keynesian model. The theory of demand and consequently the determinants of the NAIRU differ. With an appropriate

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[7]   Lavoie (2002) and Casetti (2002) propose Kaleckian growth models with conflict inflation, where a higher price level has no effects on demand. In such a model a NAIRU will exists, though it is not mentioned explicitly by either author, but it affects only inflation, but no real variables.

specification of the demand side and endogeneity of the NIARU itself, equations (1)-(9) would be acceptable.

First, the effect of inflation on demand is usually (at least for medium levels of inflation) thought of as positive (or nil) rather than negative. In particular Post Keynesians argue that deflation will have a contractionary rather than an expansionary effect. This is sometimes called the Fisher effect and is due to the real value of debt and debt services increasing.[8] Second, income distribution may affect demand, with the standard Kaleckian assumption (for a closed economy) being that and increase in the wage share will have a positive effect on output because of the savings differential between capital income and labor income.

Thus the demand closure in the Post Keynesian NAIRU model will be:

$$y^{IS} = y_0 + y_3\boldsymbol{p} + y_4\left(D - p\right) \text{ with } y_2 > 0, y_3 < 0 \text{ without CB} \qquad\qquad 13.\text{PK}$$

If the Central Bank follows a Taylor Rule the extended IS-curve becomes:

$$y^{IS-CB} = y_0 + y_3\boldsymbol{p} - y_2\left(i - p\right) + y_4\left(D - p\right)$$

Keynesians have long emphasized the role of effective demand in determining the level of output and employment. The labor market is usually thought of as adjusting passively to the level of effective demand, which is why Sawyer (1996) speaks of the labor sector rather then the labor market in Post Keynesian economics. As a consequence Post Keynesians argue that the NAIRU itself is endogenous.

One reason why, the NAIRU should be endogenous was already discussed above: hysteresis in wage formation. Employment, being dragged along with demand, will respond slowly, because insiders may not consider the long-term unemployed as competitors. However, the PK case for the endogeneity of the NAIRU is much broader. Indeed, there are several arguments. First, PKs reject the neoclassical theory of income distribution based on

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[8] In fact at moderate levels of inflation, roughly below 20%, inflation is positively correlated with growth (Bruno and Easterly 1998).

technology and preferences. Rather wage and profit aspirations are based on conventional behavior. Therefore, wage claims themselves will depend on the past experience.[9]

A simple way to formalize this argument is the following: Assume that autonomous wage laims increase if the actual wage share is higher than wage claims. In other words, workers get used to their higher income share. The same conventionalist argument would hold for profit claims.[10]

$$\hat{w}_0 = a\left[(1-p)-(1-p)^W\right]$$

$$\hat{p}_0 = b\left[p - p^R\right]$$

Since the NAIRU is determined by autonomous income claims, it would also become endogenous:

Since $(1-p)-(1-p)^W > 0$ and $p - p^R > 0$ if $u > u_N$:

$$\hat{u}_N = g(u - u_N) \text{ if } u > u_N \text{, since } u_N = (p_0 + w_0 - 1)/w_1 \text{ and thus } \hat{u}_N = \hat{p}_0 + \hat{w}_0$$

The NAIRU would thus follow the path of actual unemployment.

Second, the level of employment will depend on the capital stock (in combination with imperfect substitutions between capital and labor), an issue that has been established empirically by several studies (Sarantis 1993, Arestis and Biefang-Frisancho Maricsal 1998, Stockhammer 2004a).[11] Thus the NAIRU in Post Keynesian model will depend, next to labor market institutions, depend on the capital stock and past unemployment

$$1 = p_0(y, K) - p_2 \Delta p + w_0 - w_1 u(y) - w_2 \Delta p \text{ and } K = \sum_t f(y_t)$$

Third, it has been argued that profit claims would be affected by the interest rate (Hein 2005). An increase in the interest rate would thus affect not only actual unemployment, but also the NAIRU.

$$p_0 = h(i - p) \text{ thus } \partial u_N / \partial i = h/w_1$$

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[9] This formulation is similar in spirit, if not in detail, to that of Setterfield (2005). In Setterfield's model wage aspirations refer to the growth of wages rather than the wage share. Thus if productivity growth increases, wages may lag behind and still be in line with aspirations.

[10] The analogy will only hold in a closed economy. In an open economy with capital mobility, profit claims will not readily adjust to past experiences at home but strongly depend on profitability abroad. Thus we would expect that in the real world, alpha be much greater than beta.

[11] This has the important implication that if there is a significant change in the capital stock (that is an investment boom or slump), the relation between unemployment and capacity utilization will shift (Rowthorn 1995).

There are several other arguments that have been put forward by Post Keynesians, but in the framework presented here, they are not crucial, though they would reinforce the argument presented her.[12] The key point is as Lavoie (2005) points out that the natural rate of growth is endogenous.

To simplify the presentation the effects of inflation and income distribution will be discussed separately. Figure 3 shows the interaction of the PC and demand assuming that $\partial y/\partial p = 0$. Without Central Bank intervention the demand curve will have a positive slope. If u is below u_N, there will be accelerating inflation. In the next period the PC will shift upwards and the resulting u_2 will be further away from u_N than u_1. Thus without Central Bank intervention the system is unstable (at moderate inflation rates). If the Central Bank's reaction function inverts the slope of the demand function, the system will be stable. In either case because of 9.PK the NAIRU will follow the actual unemployment.

Insert Fig 3 about here

Figure 4a and 4b present the interaction of the distribution curve and demand assuming that $\partial y/\partial p = 0$. Depending on the wage elasticity the system may be stable (Fig. 4a) or unstable (Fig. 4b). Note that a higher wage elasticity gives rise to a higher likelihood of instability. In either case the NAIRU will follow actual unemployment (Stockhammer 2004b).

Insert Fig 4a and 4b here

To wrap up, most Post Keynesians would probably accept that there is a NAIRU at any point in time, but it is neither exogenous nor is it a strong attractor for actual unemployment. Inflation does not have a monetary cause, but a real cause: distributional conflicts. This is why many Post Keynesians would be sympathetic with the inflation aspect of the NAIRU story. However, there is no automatism that would ensure that actual unemployment returns to the NAIRU. Monetary policy, if following a Taylor rule, however could create a policy

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[12] Kriesler and Lavoie (2004) argue that the relation between capacity utilization and inflation is non-linear. For a broad range of "normal" capacity utilization variations in capacity utilization will have no inflationary effect.

mechanism that stabilizes actual unemployment as well as the NAIRU. If so, however, the NAIRU is a policy induced phenomenon rather than a purely economic one.

The inverse real balance effect and a wage-led demand regime do have an important consequence: the equilibrium will become unstable. If wages increase growth, growth increases employment and higher employment improves the bargaining position of labor, then a deviation from equilibrium will be self-sustaining. In the real world, however, such an effect would be dampened because of two factors that are conveniently ignored in the above discussion. First the foreign trade makes actual national economies (but not the world economy as a whole) profit-led rather than wage-led (Bowles and Boyer 1995). Second, automatic stabilizers (progressive income taxes, unemployment benefits etc) will tend to push the economy towards equilibrium.

A Marxist quasi-NAIRU

While there is a rich and ongoing debate among Marxists on the theory of money, surprisingly few Marxian contributions exist on the theory of inflation. [13] The basic tension in Marxian monetary theory is the one between commodity money and credit money (nicely exposed in Foley 1983). Whereas in Volume I of Capital presents a theory in which money has to be a commodity itself ("Gold confronts other commodities as money only because it confronted them previously as a commodity" Marx 1976, 162), he and more so Hilferding emphasized that, at least temporarily, not only fiat money by the state but also endogenously created means of payment such as bills of exchange can play this role. Moreover, in the later chapters of Volume III of Capital Marx highlights the role of credit in the business cycle. Today there is a lively debate on whether money in Marxian theory is commodity money or credit money (Itoh and Lapavitsas 1999, Germer 2005, Bellofiore 2005). Unfortunately for our purpose the reference point for this debate is the Marxian theory of value and not the explanation of inflation, though these theories will also have implication for inflation theory.

In particular French Marxists have elaborated inflation as a symptom related to the use of credit money in the postwar era and the stagflation of the 1970s as symptom of the crisis of the Fordist mode of regulation (Aglietta 1979, Lipietz1985). Credit in this view is a pre-

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[13] Out of some eight consulted introductions to Marxian economics only Harvey (1982) had a section on inflation.

validation of the value of produced commodities that can smooth out demand variations and enhance accumulation. If, however, the underlying class relations, demand structures, and productivity developments are contradictory, credit money will only post-pone the day of crisis and adjustment. Lipietz' enchanted world of inflationary world will eventually hit the hard ground of real constraints.

If money in the last instance is commodity money, then inflation is due to an excessive growth of the money supply.[14] The "true" (that is with respect to the realization of values) money supply is given more or less exogenously and credit money only creates temporary deviations from the balance between money and (produced) values. Consequently Itoh and Lapavitsas criticize Post Keynesians (in particular B. Moore) for not realizing that "Endogenously created credit money can be profoundly destabilising in terms of both prices and real accumulation." (Itoh and Lapavitsas 1999, 244). Inflation in this view is, or at least can be, caused by an excessive growth of the money supply, which is itself regarded as a symptom of overaccumulation (Harvey 1982).

So far there is indeed little to recommend the NAIRU theory as a Marxian theory of inflation. The major exception is Rowthorn (1979) who argues that from a class conflict point of view the outcome of inconsistent income claims of workers, capitalists, the state and the foreign sector can either be resolved in real terms by a recession and unemployment or in nominal terms by unexpected inflation. The model he proposes is basically equivalent to what was discussed as conflict inflation under the heading of Post Keynesian theory. Indeed, few Marxists have made reference to Rowthorn (1979),[15] whereas Post Keynesians have integrated him, even though Rowthorn developed his arguments in a Marxist terminology.

Things look different once we turn to the Marxian theory of unemployment. While few Marxists have emphasized the similarity between the Marxian reserve army of the unemployed and the NAIRU, these two concepts are indeed similar. In particular if one thinks of Goodwin's (1967) formalization of the Marxian argument. While not explicitly highlighting parallels between NAIRU and Goodwin Shakih notes a similar property: in Goodwin's model "greater labor strength would (…) serve to increase the long-run

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[14] Proponents of commodity money do not deny that money as medium exchange can be credit money, but insist that money as a measure of value has to be commodity money.
[15] Remarkably none of the contributions in Moseley (2005) refer to Rowthorn (1979).

equilibrium rate of unemployment." (Shaikh 2004, 140). This has been noticed by Pollin "Marx and Kalecki (…) share a common conclusion with natural rate proponents, in that they would all agree that positive unemployment rates are the outgrowth of class struggle over distribution of income and political power" (Pollin 1998, 5).

Obviously the terminology used in these theories differs. Hardly any New Keynesian would write about class struggle, but use the term wage bargaining, which as Marxists would readily admit, is one important aspect of class struggle in modern capitalism. [16] The biggest difference between Marxian models of the reserve army and NAIRU models is first that the former usually employ a real wage Phillips curve (or wage curve), whereas NAIRU models are centered around a nominal wage/inflation Phillips curve; second most Marxian in the Goodwin tradition focus on the disequilibrium dynamics rather than on comparative statics.

Substituting "factors influencing the relative strength of workers" for "labor market institutions", most of the variables used by New Keynesians to determine the NAIRU would be acceptable (except maybe the tax wedge). Higher or longer unemployment benefits, the membership of trade unions, minimum wages certainly qualify. And, most of all of course, unemployment as worker discipline device. Some genuine class struggle variables would have to be added to the determination of workers' wage aspiration, such as labor militancy, though these are rather difficult to measure empirically (strike activity is sometimes used), but New Keynesians would probably not object to including these.

Typically Marxian economic models are profit-driven, because investment is driven by profits.[17] After our incocnlusive discussion of the Marxian theory of inflaqtion we assume that inflation itself has no effect on output. Thus the Marxian demand closure is

$$y = y_0 + y_3 \boldsymbol{p} \quad \text{with} \quad y_2 = 0, y_3 > 0 \qquad\qquad\qquad 8.\text{Mx}$$

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[16] Indeed Social Structure of Accumulation theorists have highlighted that de-politicized wage negotiations form a crucial part of the Fordist labor accord (Bowles, Gordon and Weisskopf 1986).

[17] The profit squeeze theory (of which the Goodwin model is part) is fo course not the only Marxist crisis theory. Since the seminal contributions of Shaikh (1978) and Weisskopf (1979) Marxian crisis thoeries are usually grouped under the heading of unederconsumption/realization problems, profit squeeze and organic composition of capital theories. The latter with its focus on technical change is well beyond the scope of this paper. Underconsumptionist theories would for the purpose of this paper be equivalent to the wage-led regimes discussed in the PK section. Thus, in the main part of this section only profit squeeze models are discussed as Marxist.

In the Marxist thoery on would also expect an endogenous NAIRU since Marx highlights that "In contrast (…) with the case of other commodities, the determination of the value of labour-power contains a historical and moral element" (Marx 1976, 275). As in the Post Keynsian case workers will form their wage claims based on their past wage levels. Again the Marxian quasi-NAIRU is thus endogenous. However, this turns out to be of less significance than in the PK case.

Figure 5 present the Marxian quasi-NAIRU, where u^{IS} is based on 8.Mx. In the short run the mechanics of the Marxist model are thus surprisingly close to those of the New Keynesian one, though for different reasons. The adjustment mechanism of the goods market differs. In the case of New Keynesians, it is a real balance effect, in the case of Marxists it is profit-driven investment expenditures that adjusts output should actual unemployment deviate from the NAIRU. Unlike the PK wage-led growth regime the Marxist profit-led regime is stable. Therefore the endogeneity of the NAIRU itself is less important.

insert FIGURE 5 about here

What are the policy conclusions of the Marxist interpretation of the NAIRU? While the NAIRU story is aimed at making workers accept lower wages, the Marxian story would tell them that wage increases, which would be justified since workers produce the output after all, will contradict the logic of capitalist accumulation. Thus to actually consume the fruits of their labor, workers ought to do away with capitalism.

While Marxists would have little disagreement with the mechanisms involved in the NAIRU story, they do contradict its empirical claims. The reason for the rise of unemployment is not overgenerous welfare state, but a slowdown in accumulation (Duménil and Levy 1999). Thus the empirical claim that unemployment has been pushed up by labor market institutions is disputed. For Marxists, the 1980s are a period of defeat of labor, thus less rather than more unemployment would be needed to stabilize income distribution. Rather changes in the structure of accumulation have caused a slowdown in growth and thus unemployment. The exact definition of and the reasons for these changes are subject to debate. Duménil and Levy (2001) argue that neoliberalism is characterized by profits being appropriated as financial profits rather than industrial profits, which has a detrimental effect on investment. This would correspond to an inward shift of the IS-curve in Figure 5, which would give a new

equilibrium with higher unemployment and higher profits. This scenario fits the stylized facts for European unemployments since 1980 (Stockhammer 2004c). Thus while the theoretical model of the Marxists is closer to the New Keynesians, their assessment of the causes of the rise of unemployment are very similar to those diagnosed by Post Keynesians.

Conclusion

The task of this paper was to evaluate whether the NAIRU theory is a Monetarist, New Keynesian, Post Keynesian or Marxist theory. We distinguished carefully between the NAIRU theory, which derives an (expectations-augemented) Phillips Curve from income claim functions by labor and capital, and the NAIRU story which claims that actual unemployment is determined by NAIRU (rather than vice versa) and that actual unemployment in Europe has been rising because of adverse changes in labor market institutions. The paper sought to demonstrate that different demand closures as well as different NAIRU closures give rise to New Keynesian, Post Keynesian and Marxist interpretations of the NAIRU.

The NAIRU theory is a New Keynesian theory, because it does not involve market clearing and the wage setting function is understood as a bargaining outcome. The resulting unemployment at the NAIRU is involuntary, contrary to the Monetarist natural rate. Thus the NAIRU is not a Monetarist theory proper, even though the policy recommendations based on the NAIRU story coincide with standard neoclassical policies. New Keynesians argue that changes in inflation (caused by deviation of actual unemployment from the NAIRU) will realign output such that actual unemployment will gravitate towards the NAIRU. The NAIRU story is a particular interpretation of this New Keynesian interpretation. However, the NAIRU story involves empirical claims (exogenous NAIRU) that not all New Keynesians share and that are empirically contested.

Post Keynesian reactions to the NAIRU differ, ranging from outright rejection to revisions of the NAIRU model. In fact the NAIRU model is consistent with the Post Keynesian theory of inflation in that inflation is caused by a real distributional conflict rather than by growth of the money supply. The Post Keynesian demand closure has a Fisher effect and a wage-led demand regime. Thus the equilibrium will be unstable and the NAIRU will be a repellant rather than an attractor (in a closed economy), unless the government or central banks

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stabilize. In addition the NAIRU is regarded as endogenous. Thus the policy recommendations are traditional Keynesian demands for active fiscal and monetary policy.

Marxists usually are more concerned with real rather than with nominal wages, however the NAIRU model is also consistent with a Marxist interpretation. Of course the terminology differs from New Keynesians. Marxists would speak of factors influencing the relative power of workers in class struggle rather than, like New Keynesians, about labor market institutions influencing workers bargaining power. However, the actual empirical measures used come down to the same effect. There is however a difference on the goods market: rather than a real balance effect or a central bank reaction function profit-driven investment provides the goods market adjustment mechanism.

Despite these analytic similarities, Marxists reject the NAIRU story, on the grounds that workers' strength has declined rather than increased in the 1980s and 1990s. Their explanation of the rise of unemployment in Europe is closer to the Post Keynesian interpretation, in that the slowdown in private accumulation and government expenditures is blamed.

Where does the conceptual clarification attempted in this paper leave the researcher working on unemployment? First, a simple model nesting competing economic theories can be built. In this model the various theories discussed can be regarded as special cases which correspond to particular restriction in the model. Second, these restrictions can be tested empirically to assess the plausibility of the various closures imposed by the theories discussed. In particular this would require empirical answers to the following questions:

- Is actual unemployment driven by changes in labor market institutions?
- How large is the hysteresis-effect in unemployment and wages?
- Does demand respond positive or negative to changes in inflation?
- Is demand wage-led or profit-led?

Of course, many of the relevant tests have already been carried out, though not exactly in the framework outlined above. Evaluating these tests would or performing them would be subject of a follow-up paper.

References

Aglietta Michel, 1979. A Theory of Capitalist Regulation. The US Experience. London: Verso

Alexiou, C, Pitelis, C, (2003) On capital shortages and European unemployment: a panel investigation. JPKE 25 (4), 613-640

Arestis, P, Biefang-Frisancho Mariscal, I, 1998. Capital shortages and asymmetries in UK unemployment. Structural Change and Economic Dynamics 9: 189-204

Arestis, P, Sawyer, M, 2002. "New Consensus," New Keynesianism, and the Economics of the "Third Way" Levy Institute Working Paper 345

Arestis, P, Sawyer, M, 2003. Aggregate Demand, Conflict, and Capacity in the Inflationary Process. Levy Institute Working Paper 391

Ball, L, Mankiw, G, 2002. The NAIRU in theory and practise. Journal of Economic Perspectives. 16, 4: 115-136

Ball, Laurence, 1994. Disinflation and the NAIRU. In: C. Romer and D. Romer (eds.): Reducing Inflation. Motivation and Strategy. Chicago: University of Chicago Press

Ball, Laurence, 1999. Aggregate Demand and Long-Run Unemployment. Brooking Paprer on Economic Activity 2, 1999: 189-236

Bellofiore, Riccardo, 2005. The monetary aspects of the capitalist process in the Marxian system: an investigation from the point of view of the theory of the monetary circuit. In: Fred Moseley (ed): Marx' Theory of Money. Modern Appraisals. Houndsmills: Palgrave Macmillan

Blanchard, O. Summers, L. (1988): Beyond the Natural Rate Hypothesis, in: American Economic Review 78, Nr. 2, S. 182-187.

Blanchard, O., Wolfers, J. (2000): The role of shocks and institutions in the rise of European unemployment: The aggregate evidence, in: Economic Journal Nr. 110, S. 1-33.

Blanchard, Olivier, 1990. Unemployment: Getting the Questions Right--and Some of the Answers. In: J Dreze and C Bean (eds): Europe's Unemployment Problem. Cambridge MA: MIT Press

Bowles S, Gordon D, Weisskopf T E, 1986. Power and Profits: The Social Structure of Accumulation and the Profitability of the Postwar US Economy, *Review of Radical Political Economics* 1986/1&2, 132-167

Bowles, S, Boyer, R, 1995. Wages, aggregate demand, and employment in an open economy: an empirical investigation. In: G Epstein and H Gintis (eds): Macroeconomic policy after the conservative era. Studies in investment, saving and finance. Cambridge: University Press

Carlin, W, Soskice, D, 1990. Macroeconomics and the Wage Bargain. A Modern Approach to Employment, Inflation and the Exchange Rate. Oxford: Oxford University Press

Davidson, Paul, 1998. Post Keynesian employment analysis and the macroeconomics of OECD unemployment. Economic Journal 108: 817-831

de Brunhoff, Suzanne, 2005. Marx's contribution to the search for a theory of money. In: Moseley, F. (ed): Marx's Theory of Money. Modern Appraisals. Houndsmills: Palgrave Macmillan

Duménil, G, and D. Lévy, (2001) 'Costs and benefits of Neoliberalism: a class analysis' Review of International Political Economy 8 (4), 578-607

Duménil, G, Lévy, D, 1999. Structural unemployment in the crises of the late 20th century: a comparison between the European and the US experiences. In: R. Bellofiore (ed): Global Money, Capital Restructuring and the Changing Patterns of Labour. Cheltenham, UK: Edward Elgar

Ehrbar, M, Gambacorta, , L, Maretinez-Pagés, J, Sevestre, P, Worms, A. 2003. The effects of monetary policy in the Euro area. Oxford Economic Policy Review 19, 1: 58-72

Foley, Duncan, 1983. On Marx's theory of money. Socia Concept 1 (1), 5-19

Friedman ; Milton, 1977. Inflation and Unemployment. Journal of Political Economy 85, 3: 451-472

Friedman, Milton, 1968. The Role of Monetary Policy. American Economic Review 58: 1-117

Germer, Claus, 2005. The commodity nature of money in Marx's theory. In: Fred Moseley (ed): Marx' Theory of Money. Modern Appraisals. Houndsmills: Palgrave Macmillan

Gordon, David, 1987. Six Percent Unemployment Ain't Natural. Social Research 54, 2: 223-244

Gordon, David, 1988. The Un-Natural Rate of Unemployment: An Econometric Critique of the NAIRU Hypothesis. AER 78, 2: 117-123

Gordon, Robert, 1997. The time-varying NAIRU and its implications for economic policy. Journal of Economic Perspectives 11, 1: 11-32

Harvey, D., 1982 The Limits to Capital. Blackwell, Oxford

Howell, David (ed) 2005. Fighting Unemployment. The limits of free market orthodoxy. Oxford University Press

Itoh, M, Lapavitsas, C, 1999. Political economy of money and finance. Houndsmill: Macmillan

King 2001. Some elements of a Post Keynesian labour economics. Arestis, P., Desai, M., and Dow, S. (eds): Money, macroeconomics and Keynes. Essays in honour of Victoria Chick, Volume One. London and New York: Routledge

King, J. (2002): A History of Post Keynesian Economics since 1936, Cheltenham.

King, John, 2002. Labor and unemployment. In: Holt, R. and Pressman, S. (eds): A New Guide to Post Keynesian Economics. London and New York: Routledge

Kriesler, P, Lavoie, M, 2004 The New View on monetary policy: the New Consenus and its Post-Keynesian critique. manuscript

Lavoie, Marc, 1992. Foundations of Post-Keynesian Economic Analysis. Aldershot: Eduard Elgar

Lavoie, Marc, 2004. The New Consensus on monetary policy seen from a post-Keynesian perspective. In: Lavoie, M, and M. Seccareccia (eds): Central Banking in the Modern World. Cheltenham, UK: Edward Elgar

Layard, R, Nickell, S, Jackman, R, 1991. Unemployment. Macroeconomic Performance and the Labour Market. Oxford: Oxford University Press

Lindbeck, A, 1993. Unemployment and Macroeconomics. Cambridge, MA: MIT Press

Lipietz Alain, 1985. The Enchanted Word. London: Verso

Lipietz Alain, 1985. The Enchanted Word. London: Verso

Madsen, Jakob, 1998. General equilibrium macreoecnomic models of unemployment: can they explain the unemployment path in the OECD? Economic Journal 108: 850-67

Marx, Karl, 1976. Capital. A Critique of Political Economy Volume One. Penguin Books

Modigliani, F, Fitoussi, J, Moro, B, Snower, D, Solow, R, Steinherr, A, Sylos Labini, P, 1998. An economists' Manifesto on unemployment in the European Union. Journal of Income Distribution 8: 163-187

Nickell, Stephen, 1997. Unemployment and Labor Market Rigidities: Europe versus North America. JEP 11, 3: 55-74

Nickell, Stephen, 1998. Unemployment: Questions and Some Answers. Economic Journal 108: 802-816

Palley, Thomas, 1996. Post Keynesian Economics. Debt, Distribution and the Macro Economy. London: Macmillan

Phelps, Edmund, 1968. Money-Wage Dynamics and Labor-Market Dynamics. Journal of Political Economy 78, 4: 678-711

Pollin, Robert, 1998. The "Reserve Army of Labor" and the "Natural Rate of Unemployment": Can Marx, Kalecki, Friedman, and Wall Street All Be Wrong? RRPE 30, 3: 1-13

Robinson, Joan, 1937. Introduction to the theory of employment. London: Macmillan

Rochon, Louis-Philippe, 1999. Credit, money and production. An alternative post-Keynesian approach. Aldershot: Edward Elgar

Rowthorn , Robert, 1999. Unemployment, wage bargaining and capital-labour substitution. Cambridge Journal of Economics 23: 413-425

Rowthorn, Robert, 1977. Conflict, inflation and money. CJE 1, 3. Reprinted in: Bob Rowthorn: Capitalism, Conflict and Inflation. London: Lawrence and Wishart, 1980

Rowthorn, Robert, 1995. Capital Formation and Unemployment. Oxford Review of Economic Policy 11, 1: 26-39

Rowthorn, Robert, 1999. Unemployment, Capital-Labor Substitution, and Economic Growth. IMF Working Paper 99/43

Sarantis, Nicholas, 1993. Distribuation, aggregate demand and unemployment in OECD countries. Economic Journal 103: 459-467

Sawyer, Malcolm, 1996. Post-Keynesian macroeconomics. In: Greenaway, D, M. Bleaney, and Ian Stewart (eds): A Guide to Modern Economics. London Routledge

Sawyer, Malcolm, 2001. The NAIRU: a critical appraisal. In: P. Arestis and M. Sawyer (eds.): Money, finance and capitalist development. Cheltham, UK: Edward Elgar

Sawyer, Malcolm, 2002. The NAIRU, aggregate demand and investment. Metroeconomica 53, 1: 66-94

Setterfield, Mark, 2005. Worker insecurity and US macroeconomic performance during the 1990s. Review of Radical Political Economy 27, 2: 155-77

Setterfield, Mark, Lovejoy, Ted, 2005. Aspriations bargaining power and macroeconomic perfomance. manuscript Feb 2005

Shaikh, Anwar, 1978. An Introduction to the History of Crisis Theories. In URPE (ed): U.S. Capitalism in Crisis, New York.

Shaikh, Anwar, 1999. Explaining Inflation and Unemployment: An Alternate to Neoliberal Economic Theory In Andriana Vachlou (ed.)Contemporary Economic Theory, Macmillan, London

Shaikh, Anwar, 2004. Labor market dynamics within rival macroeconomic frameworks. In: Argyrous, G, Forestater, M, and Mongiovi, G (editors): Growth, Distribution and Effective Demand. Alternatives to Economic Orthodoxy. Essays in Honor of Edward J Nell. Armonk, NY: M.E: Sharpe

Siebert, Horst, 1997. Labor Market Rigidities: At the Root of Unemployment in Europe. JEP 11, 3: 37-54

Soskice, D, Carlin, W, 1989. Medium-run Keynesianism: hysteresis and capital scrapping. In: Paul Davidson and Jan Kregel (eds): Macroeconomic problems and policies of income distribution: functional, personal, international. Aldershot: Edward Elgar

Staiger, D, Stock, J, Watson, M, 1997. The NAIRU, unemployment and monetary policy. Journal of Economic Perspectives 11, 1: 33-50

Stockhammer, E. and O. Onaran (2004), 'Accumulation, Distribution and Employment: A Structural VAR Approach to a Kaleckian Macro-model' *Structural Change and Economic Dynamics* 15 (4), 421-47

Stockhammer, Engelbert (2004c) The rise of unemployment in Europe: a Keynesian approach. Cheltenham, UK: Edward Elgar

Stockhammer, Engelbert, 2004a. Explaining European unemployment: testing the NAIRU hypothesis and a Keynesian approach. *International Review of Applied Economics* 18 (1) 3-24

Stockhammer, Engelbert, 2004b. Is there an equilibrium rate of unemployment in the long run*? Review of Political Economy*: 16 (1) 59-77

Weisskopf, Thomas, 1979. Marxist crises theory and the post-war U. S. Economy. Cambridge Journal of Economics 3: 341-78

Table 1. A NAIRU reference model

wage claims	$(1-\boldsymbol{p})^W = w_0 - w_1 u(y)$	(1)
profit claims:	$\boldsymbol{p}^R = \boldsymbol{p}_0$	(2)
realized wage share	$(1-\boldsymbol{p}) = w_0 - w_1 u(y) - w_2 p^U$	(3)
realized profit share	$\boldsymbol{p} = \boldsymbol{p}_0 - \boldsymbol{p}_2 p^U$	(4)
national income (standardized to 1)	$1 = \boldsymbol{p}_0 + w_0 - w_1 u(y) - (\boldsymbol{p}_2 + w_2) p^U$	(5)
adaptive expectations	$p_t^E = p_{t-1}$, thus $p^U = \Delta p$	(6)
unemployment	$u = n - y$	(7)
demand	$y = y_0 + y_2 p + y_3 \boldsymbol{p}$	(8)
NAIRU	$\hat{u}_N = \boldsymbol{g}(u - u_N)$, where $u_N = (\boldsymbol{p}_0 + w_0 - 1)/w_1$	(9)

where π, u, p and z are the profit share, the rate of unemployment, the rate of inflation and capacity utilization. w_0 can be interpreted as target wage share, π_0 as target profit share superscript U stands for unexpected

Fig. 1 Monetarism

p

PC_2

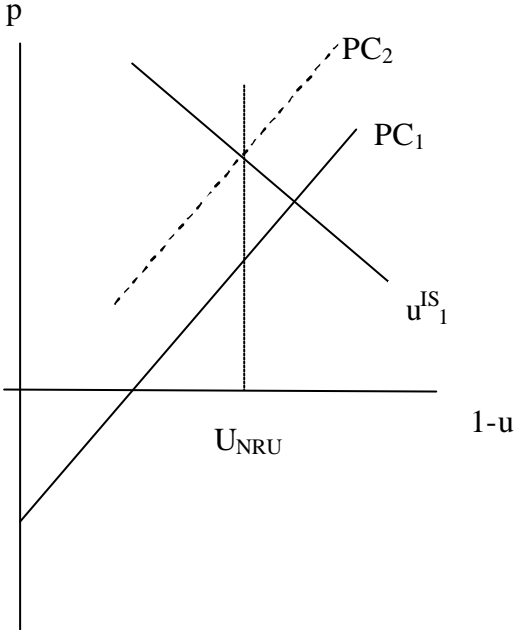PC_1

u^{IS}_1

U_{NRU}
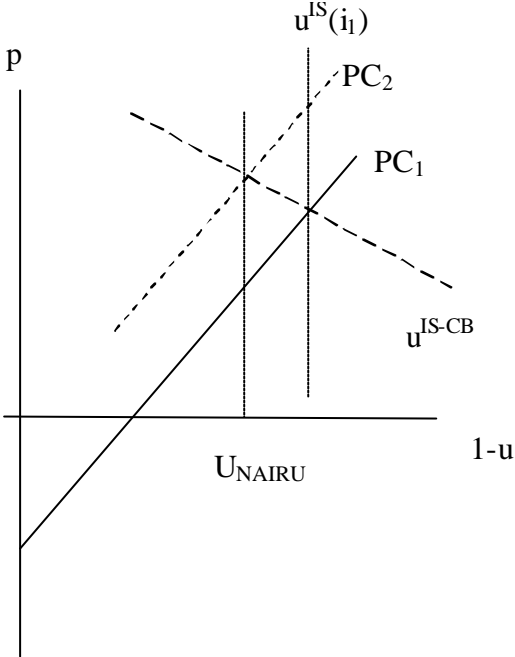
$1-u$

Fig 2 New Keynesian NAIRU
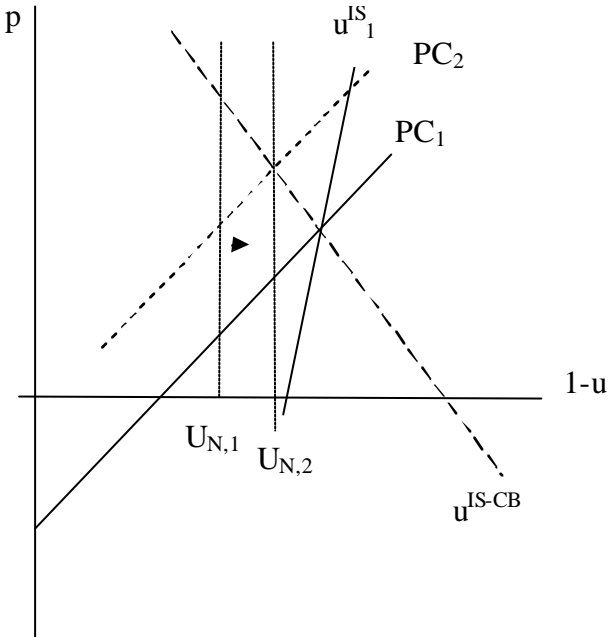
Fig. 3 Post Keynesian NAIRU

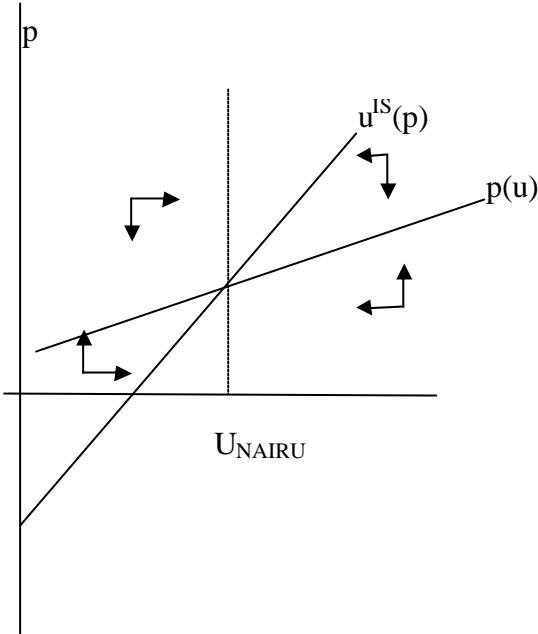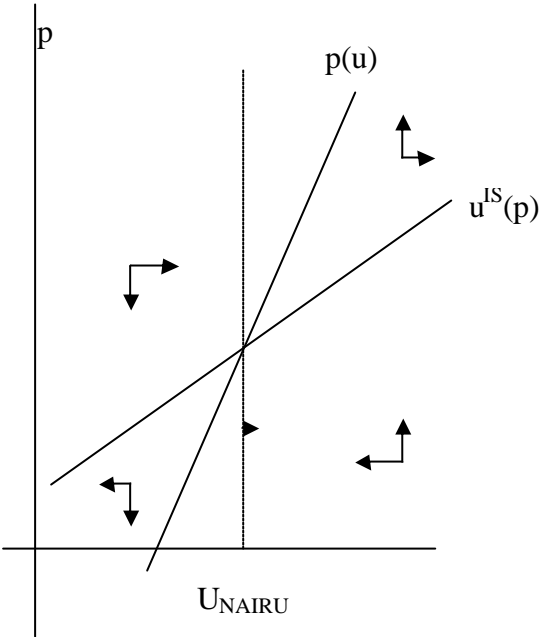Fig 4a. A stable PK NAIRU with distribution-led demand

Fig 4b. An unstable PK NAIRU with distribution-led demand

Fig 5. A Marxian quasi-NAIRU