

From Full Employment to the Natural Rate of Unemployment: A Survey

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Abstract

On its face, unemployment seems to be a concept easy to grasp. But when one looks closer, the intricacies are numerous and assumptions are multiple. Nowadays, the New Classical School is a bit closer to New Keynesianism than ever before. It still has a strong footprint in Monetarism, since in the long run, there is no interest in stabilizing an economy. But unlike the Classical school, the New Classical School concedes that in the short run things are much more complicated. If Keynes was right when he said, “in the long run, we are all dead,” one may even conclude that the New Classical School is far more Keynesian than it first appears.

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“Ideas shape the course of history”

John Maynard Keynes
(1883-1946)

⁺ A largely revised version of this paper is forthcoming in *International Encyclopedia of Public Policy*, edited by Phil O’Hara (Routledge: London and New York).

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1. Introduction

In the U.S. after the Second World War, the commitment was made by the federal government to “use all practicable means... to promote maximum employment, production, and purchasing power.” To this end it established the Council of Economic Advisers and created the Joint Committee on the Economic Report, bodies which are jointly indicative of the assumption of federal responsibility for the general economic welfare of the nation. The support given by President Eisenhower to the Council, and his request for modifications of the original act to strengthen the Council administratively, supports the validity of the earlier premise that the commitment to economic stabilization transcended political boundaries and was made a permanent national priority. According to Strayer (1954), 1954 marks a new perception in the role of government towards full employment and welfare.

The notion of unemployment seems to be well understood since many people, from economists to laypeople, use it with relative frequency. But when one looks closer, the notion of unemployment hides a world of complexity with which even economists have trouble dealing. Unemployment reflects employment, full employment, underemployment, and the natural rate of unemployment, to name a few concepts. Before looking at the many facets of unemployment with a more precise lens, let us begin with a few definitions.

UNEMPLOYMENT. In 1947, F. A. Buchardt (University of Oxford, 1947) looked at theories about the “Cause of Unemployment.” Buchardt ascribed unemployment to deviations from free competition: “monopolistic organizations in industry and in the labor market... restrict output and employment opportunities.” Buchardt believed in the “revolutionary discovery” of his predecessors that the market does not automatically produce full employment. This rendered “obsolete” the idea that market forces lead to a rational utilization of resources.

Through this lens market structure creates market failures and unemployment is, by definition, involuntary.

FULL EMPLOYMENT. Having defined unemployment, it becomes easy to describe full employment. Full employment, is “[an] economic norm...destined to achieve in the twentieth century an acknowledged priority comparable to the position held by the division of labor in the eighteenth century, and by the optimum allocation of resources in the nineteenth century,” Benoit-Smullyan (1948). Whereas the notion of unemployment is positive, full employment embodies a normative approach. If unemployment is due to market misallocations, then full employment is rooted in active economic policies.

UNDEREMPLOYMENT. Before implementing active policies with respect to maintaining full employment, it is vital to question to know in which areas the economy is underemployed. In his paper, Hansen (1947) emphasized the danger of inflation due to general under capacity of fixed plant and equipment.

Essentially, this questioned the nature of production cost structure, and more generally, the efficiency of the structure of the economy. Without coining it in the modern way, Hansen (1947) addressed the question of market failures and full employment: “the price system continuing full employment is in the nature of the case not feasible, that to have stable employment it is necessary to have several million employed (...). This is due to inadequate fixed-capital capacity (...). (T)he distortion is inherent in the nature of the cost structure.” One can note the use and association of the words ‘nature’ and ‘structure.’ As we shall study later, this association will be coined in discussions regarding the concept of the natural rate of unemployment.

To Hansen (1947), “The term ‘capacity’ as the literature reveals, is not easy to define in a satisfactory manner, since there is no one ‘capacity’ output which could not be exceeded more or less if the fixed plant were more intensively utilized. ‘Capacity’ may perhaps best be defined in terms of the total unit cost at varying degrees of intensive use of the fixed factor. Thus in a highly fluctuating economy, it might be true that a firm would tend to adjust its fixed factor so as to produce the ‘normal (Schumpeter) amount at lowest total unit cost would rise more or less steeply. Thus one could say that the economy was operating at ‘opti-

mum capacity' at the 'normal' phase in the cycle." This 'optimum capacity' leads to full employment if there are no further distortions, and wages can be defined as 'efficiency wages.'

NATURAL RATE OF UNEMPLOYMENT. Friedman (1968) derives the 'natural rate hypothesis' (NRH) from Wicksell's (1936) concept of the 'natural' rate of interest: "The 'natural rate of unemployment' is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the cost of mobility, and so on" (Friedman, 1968). According to the NRH, unemployment consists of the sum of a structural component called the natural rate, and a cyclical component reflecting short-run business cycle fluctuations.

These definitions are landmarks in the history of monetary policy. They have been developed at different periods and serve as new assumptions in the fights between the main schools of thought. Sections 2 and 3 present the Keynesian and Monetarist Schools. Section 4 introduces the New Classical School. Section 5 develops the new arguments proposed by the modern literature. Section 6 concludes.

2. Full Employment: The Keynesian School

The notion of full employment was largely discussed by Joan Robinson in *Essays on the Theory of Employment* (Robinson, 1937). To Joan Robinson, full employment is synonymous with the absence of involuntary unemployment. Moreover, Joan Robinson argued that full employment could never be attained in practice: "It seems preferable to say that full employment, in a precise sense, can never be attained so long as frictions exist, rather than to use 'full employment' in an imprecise sense in which it can be said to be attainable, such unemployment as remains being vaguely attributed to frictions."

As it was later described by Benoit-Smullyan (1948), "Full employment is sometimes identified with *total* or *maximum* employment. In

this sense full employment does not exist unless every person who could perform some useful labor holds a job whether or not he desires one (...). In the terminology of modern economics ‘unemployment = *involuntary* unemployment’.” Properly understood, full employment excludes the employment of any individuals who, for one reason or another, prefer not to work. Thus, full employment is attained when the number of job vacancies equals the existing labor force. In Benoit-Smullyan's (1948) interpretation, this neither requires the maximization of the labor force, nor the employment of this labor force for the maximum achievable number of hours.

Until Keynes (1936), full employment implicitly required the maximum utilization of all factors of production and not merely labor (Benoit-Smullyan, 1948).

Can we go beyond full employment?

We have said that to have full employment there must be at least as many real job vacancies as there are employable job applicants. But ought there not be more? Was Sir William Beveridge incorrect when he claimed that full employment “means having always more vacant jobs than unemployed men” (Beveridge, 1945)?

Even before the work of Lucas (1972) which marked the starting point of the New Classical School, and right after Friedman's (1968) and Phelps' (1967) definition of the ‘natural rate of unemployment’, a paper by Pfouts (1970) challenged the predominant Chicago School and brought the Keynesian's back into the game. According to Pfouts (1970), “As an economy approaches full employment a new order of questions, both theoretical and practical arises. Many of these questions relate to the methods of maintaining full employment, but others refer to the possibilities of there being a fuller or fullest employment beyond mere full employment.” In tackling this issue, Pfouts (1970) re-introduced the idea of government intervention through expansionist policies: “Specifically, if we suppose that labor is fully employed, but that there are other resources which could be exploited but are not being exploited, should attempts be made by increasing the stock of capital to exploit these unused resources thus obtaining a higher level of living?” (Pfouts, 1970).

Government intervention for stabilization can take the form of fiscal, monetary, or structural policies.

First, with respect to fiscal policy, Gurley (1952) made a strong argument in favour of stabilization policies using the fiscal device. He denied the fact that only one fiscal policy – a public deficit for instance – should be used. Moreover, he argued that any fiscal policy (surplus, balance, or deficit) can lead towards full employment, and the choice of the fiscal policy should be based on the initial conditions.

Second, and with respect to monetary policy, the core of Keynesian polemics is the relationship between price flexibility and full employment. The fundamental argument of Keynes was directed against the belief that price flexibility can be depended upon to generate full employment automatically. This assumption marks the origin of the cleavage between Keynesianism and the classical tradition of Monetarism. Monetarists insisted upon such automaticity as a basic principle, since it is the counter part of the invisible hand applied to macroeconomics. In other words, there is no need to call for government intervention through stabilization policies or expansionary monetary policies, since economic forces balance automatically. According to Don Patinkin (1948), “[in] a static world with a constant stock of money, price flexibility assures full employment. But in the real dynamic world in which we live, price flexibility with a constant stock of money might generate full employment only after a long period; or might even lead to a deflationary spiral of continuous unemployment.” Don Patinkin (1948) demonstrated that full employment cannot be the outcome of a passive monetary policy targeting a constant stock of money and waiting for the economic system to generate full employment automatically through a decline in prices. It is striking to note that Don Patinkin (1948) described a deflationary bias without noting any impact on the unemployment rate. As we shall see later, Kydland & Prescott (1977) will formulate the idea of inflationary bias: latent inflation with no impact on the unemployment rate.

The Keynesian edifice can be summarized by the following equation which represents the relationship between the production function (aggregate supply) and the price level, where b is the elasticity of labor:

$$y_t^s = \frac{\mathbf{b}}{1-\mathbf{b}} p_t - Ln(\mathbf{b}) \quad (1)$$

Thus, a rise in the level of prices reduces the real wage, and pushes employers to hire more.

Finally, with respect to structural policy, Hamberg (1952) writes “It should be clear that the mistaken belief that full capacity growth will assure full employment growth rest on two assumptions: (1) that an equilibrium of full employment of labor and capital exists at the outset of our analysis, and (2) that the coefficient of required growth equals unity. While plausible, these assumptions are by no means general.” In other words, an economic structure that runs at full capacity does not lead to full employment.

This question had already been addressed by Keynes (1936) however: “It is indeed, very possible that the prolongation of approximately full employment over a period of years would be associated in countries so wealthy as Great Britain or the United States with a volume of new investment, assuming the existing propensity to consume, so great that it would eventually lead to a state of full investment in the sense that an aggregate gross yield in excess of replacement cost could no longer be expected on a reasonable calculation from a further increment of durable goods of any type whatever. Moreover this situation might be reached comparatively soon – say within twenty-five years or less. I must not be taken to deny this, because I assert that a state of full investment in the strict sense has never yet occurred, not even momentarily.” Thus at full employment it is possible to increase both the stock of capital and productive capacity by maintaining the proper conditions.

But implementing active policies may raise some fine-tuning questions. The concern about full employment initiated by Harrod (1960) and Domar (1947) involved two main aspects summarized by Nelson (1966): “Active stabilization policy may be required for two different reasons. First, in the absence of active policy it may be impossible to achieve the parameter values consistent with full employment; this might be the case, for example, if there is an interest rate floor. Second, even if the parameters can be achieved without active policy, tendencies of the system to move and stay at full employment may be weak.”

In other words, full employment seems to be a highly unstable equilibrium.

Although he agreed on the efficiency of economic policies (but not ‘stabilization’ policies), Kaldor (1938) examined a range of problems involved with policies aimed at maintaining a steady state of full employment: “Most economists are agreed that Governments have greater power in this matter than they are in the habit of employing, and we are nearing agreement also as to the factors that determines the efficiency of different policies to that end. But I think there is less agreement, and perhaps also less awareness, about the further problem, of how to keep the system *stable*, at a reasonable level of prosperity: in other words, how to maintain a state of full employment, once it has been achieved.”

An example of an economic policy: the concept of full employment surplus

Although it has roots in the 1930s, the concept of full employment surplus dates back to a proposal made in 1947 by the U.S. Committee for Economic Development (CED) that the budget be designed to “yield a moderate surplus at high-employment national income.” The full employment surplus is the difference between full employment revenues and full employment expenditures.

The full employment surplus is an estimate of what the federal surplus would be if the economy were operating along the path of its potential gross national product (GNP). It is, thus, not affected by fluctuations in economic activity that shrink or enlarge the revenue base relative to the path of potential growth (Okun & Teeters, 1970). A higher full employment surplus is an indicator of a more restrictive fiscal policy.

In some respects, the full employment surplus is a static concept. It describes how much fiscal policy is pushing the economy in a given period – it does not provide any information as to the expected timing of the resultant movement in economic activity. While a dynamic process is implied, it is not specified.

Barriers to full employment

What are the factors that prevent economies from being at full employment?

Answers are abundant, but it is striking that the Monetarists blame the government, and not the market. Indeed, government intervention was almost always synonymous with government failures, while the market was never held culpable for spawning market failures.

According to Warner (1975), “There are fiscal barriers to full employment which discourage the employment of low-skill and low-wage workers.” In his article, he argues that “[there] are a number of subsidies to capital investment in the tax and regulatory systems which encourage adoption of relatively more capital intensive techniques and probably less employment of low-wage workers than would exist in their absence (...). Indeed, even though there are offsetting full employment policies at the macro-economic level, these structural distortions undercut the effectiveness of such policies by exacerbating the problems associated with unemployment and excessive demand for capital goods.” In one way or another, Monetarists argue that government intervention creates distortions that either reduce or expand production.

Inequalities it can also be argued, are at the origin of all barriers to full employment. Michael Kalecki (University of Oxford, 1947) explained that unemployment is the result of political opposition to income transfers. Kalecki (University of Oxford, 1947) weighed the relative merits of (1) deficit spending, (2) stimulating private investment, and (3) redistributing income from the rich to the poor, as “Three ways to Full employment.” Kalecki’s general conclusions were that stimulating private investment is relatively unsatisfactory, and that income transfers are promising, but will probably have to be supplemented by public deficit spending.

In the same edited volume, Schumacher’s essay on “Public Finance – Its Relation to Full Employment” states explicitly the implicit position of his colleagues that “the ultimate cause of unemployment in modern society is to be found in the prevailing distribution of incomes”; subsequently, the principal rationale of taxation is redistribution, not the

avoidance of inflation as Keynes had argued. As long as there is a return on investment, a transfer of income from richer to poorer persons expands consumption demand, and consequently, private investment.

3. The Natural Rate Hypothesis: Latest step of Monetarism

In the late 1960s and early 1970s, the appearance of a new definition of unemployment dramatically changed the balance between Keynesians and Monetarists. Until then, Monetarists had a hard time arguing against the predominant Keynesian interpretation. Starting in 1968, however, Monetarism would take the lead and give birth to a new school of thought: the New Classical School.

One of the first discussions over the definition of full employment appeared in Meyers (1946). According to Meyers (1946) “If full employment meant complete absence of unemployment, of course any innovation would be confronted with the difficulty of attracting workers away from their present jobs. If full employment means an equal number of jobs available and unemployed persons, however, such innovation may be able to draw its workers from the “frictionally unemployed.”

Another analysis was Benoit-Smullyan's (1948): “Full employment would then be indicated whenever existing unemployment did not exceed the amount of (frictional) unemployment estimated by the normal, or necessary, result of inadequate labor market information, and of imperfect labor mobility.”

The outcome of this friction is captured in the concept coined by Blanchard & Summers (1986): hysteresis. In physics, hysteresis refers to an object failing to return to its original state after being changed by an external force. In the labor market, a similar phenomenon arises. A change in aggregate demand first influences unemployment by causing it to deviate from the natural rate of unemployment, but then has a persistent effect on unemployment as the natural rate of unemployment changes. Blanchard & Wolfers (2000) apply the concept of hysteresis to explain the large rise in the NAIRU in Europe during the 1980s .

In 1968 Friedman (1968) invented a concept that would revive Monetarism by challenge the Phillips curve: the natural rate of unemployment. This new concept is integrated in the new rational expectations assumption: “we (in particular Phelps, 1967, Phelps, 1970) and myself Friedman, (1968) developed an alternative hypothesis that distinguished between the short-run and long-run effects of unanticipated changes in aggregate nominal demand” (Friedman, 1977).

This notion would give new strength to the argument against stabilization policies. The Keynesian paradigm guided demand-side policies during the “new economics” years of the 1960s. By the 1970s, Monetarism denied that pure fiscal policies, changes in overall expenditures, and taxation that leave money stocks unaffected, have more than minor and transitory effects on nominal income.

According to Friedman (1968), monetary policy cannot peg interest rates and the rate of unemployment for more than very limited periods. Relating Wicksell (1936), Friedman (1968) explains, “The preceding analysis of interest rates can be translated fairly directly into Wickselian terms. The monetary authority can make the market rate less than the natural rate only by inflation. It can make the market rate higher than the natural rate only by deflation (...).”

The following equation summarizes the “expectations-augmented Phillips curve’, where u_t is the unemployment rate, \tilde{u} is the natural unemployment rate, Δp_t is the change in price, and $E_{t-1}(\Delta p_t)$ is the expected change in price by agents:

$$u_t = \tilde{u} - \frac{1}{1-b}(\Delta p_t - E_{t-1}(\Delta p_t)) \quad (2)$$

Moreover, according to Friedman (1968), “Money is only a machine, but it is an extraordinary efficient machine. Without it, we could not have begun to attain astounding growth in output and level of living we have experienced in the past two centuries – any more than we could have done so without those other marvellous machines that dot our countryside and enable us, for the most part, simply to do more efficiently what could be done without them at much greater cost in h-

bor.” In other words, money is a technological innovation. But because money is an innovation that effects the whole economy, it has to be kept under control: “The first and most important lesson that history teaches about what monetary policy can do (...) is that monetary policy can prevent money itself from being a major source of economic disturbance” (Friedman, 1968). Furthermore, the Monetarists’ doctrine attributed the major economic fluctuations of history to the instability of monetary supplies rather than exogenous real shocks (Tobin, S, Poole, Feldstein, Houthakker, Modigliani, Hendershott, Friedman, Perry, Duesenberry, Fellner, Gordon, Branson, Baily, & Nordhaus, 1980).

4. From natural rate to the New Classical School

Interestingly enough, Phillips (1958) brought new perspectives to the Keynesian/neo-Keynesian camp. His relationship between wage rates and unemployment added one more brick to the edifice started by Keynes: policies matter. Incidentally, his paper also revived the opposite camp by giving them a chance to spawn a new attack against Keynesianism. In 1961, Muth (1961) introduced the rational expectations concept. From Keynes (1936) to Phillips (1958), money was not neutral. But with the rise of the Chicago School, activist monetary and fiscal policies were argued to have, at best, no effects on real economic variables; at worst they could be responsible for a net increase in economic instability—distortions created by government policies.

A more precise statement of the lessons of the Monetarists and ‘policy neutrality’ view is that deterministic policy rules have no effects on real economic variables, but stochastic policy behavior can increase the variability of real variables. Although the formal analysis supporting this view is, invariably, conducted in terms of monetary policy alone, McCallum notes that conclusions are often phrased in terms of stabilization policy in general (McCallum, 1977).

The rational expectations concept was introduced by Muth (1961) and was first applied to macroeconomics by Lucas (1972). The basic insight is that private sector behavior is influenced in many ways by expectations of future variables. If changes in government behavior

causes shifts in these expectations, models that ignore such links to government behavior are unlikely to forecast accurately. The assumption of Muth-rational expectations provides the additional hypothesis that the link between private sector expectations and government behavior comes through the private sector's knowledge of the true *structure* of the model, including the parameters that describe government behavior. The proxy used by the economic literature to characterize the structure of the economy is the concept of the natural rate of unemployment.

The natural rate of unemployment also has a synonym, NAIRU, which is an acronym for non-accelerating inflation rate of unemployment. At any point in time, there will be an unemployment rate consistent with stable inflation.

The NAIRU concept brought a new impetus to the debate over “rules versus discretion.” This debate dates back to the dissensions between the Currency School and the Banking School that preceded the Peel's Act of 1844. The Currency School defended the idea of a rule of monetary policy based on the quantity theory. It is no surprise that David Ricardo was the proponent of the quantity theory as well as the head of the Currency School. The Banking School was in favor of discretionary monetary policy, however. In its early ages, the debate turned to the advantage of the Currency School, but during the period between 1844 and 1914 for instance, the Bank of England actively and discretionarily adjusted its discount rate. In the 1920s and 1930s, American monetary policy was strongly discretionary. Keynes (1936) made a strong theoretical case – if not a revolutionary one compared to the classical paradigm – in favour of discretionary and active policies. Keynesianism won the debate over its counterpart, namely Monetarism, until the first critics of the Phillips curve emerged (Phillips, 1958).

According to Friedman (1968), the Phillips curve should be formulated by considering the growth rate of real wages instead of nominal wages. Friedman specified the Phillips curve in terms of anticipated real wages, henceforth called the “expectations-augmented Phillips curve.”

The “rules versus discretion” debate studied through the lens of rational expectations would, from now on, bend towards the proponents of the rule. Monetarism would give birth to the “New Classical

School.” The big divide between the schools stems from the creation of the natural rate of unemployment concept. At once, this concept helped weaken the Keynesian edifice and destroy the Phillips curve, but also led to a smoothing of the Monetarist doctrine: economic policies, be they monetary or fiscal, may have some impacts in the short-run at least. The bases of the New Classical School can be found in the works of Lucas (1972), Sargent (1973), and Sargent & Wallace (1975).

The following equation represents the NAIRU curve with a non-anticipated exogenous shock, noted \mathbf{m} :

$$u = \tilde{u} - \frac{1}{1-\mathbf{b}}(p_t - E_{t-1}(p_t) + \mathbf{m}) \quad (3)$$

With the “time inconsistency” concept, Kydland & Prescott (1977) indicate that there exists a temptation for a central bank not to respect *ex post* its own *ex ante* monetary objectives. Rational expectations agents, aware of this behaviour, will react accordingly and push the whole system to an inflationary economy without real improvement. This is known as the inflationary bias (Barro & Gordon, 1983).

The literature defines a loss function for the central bank based on the NAIRU, where \mathbf{e} is the relative weight of inflation compared to unemployment:

$$L_t = \frac{1}{2}(\Delta p_t)^2 + \mathbf{e} \left(\tilde{u} - \frac{1}{1-\mathbf{b}}\Delta p_t + \frac{1}{1-\mathbf{b}}E_{t-1}\Delta p_t \right) \quad (4)$$

The next equation represents the maximization condition of this loss function:

$$\Delta p_t = \frac{\mathbf{e}}{1-\mathbf{b}} \quad (5)$$

This result represents the inflation rate that will occur in the economy; its impact on the unemployment rate with rational agents will be nil since

$$u_t = \tilde{u} \quad (6)$$

Barro & Gordon (1983) explained that by improving the “credibility” of the central bank, the inflationary bias should be reduced. The literature would propose many ways of improving the credibility: hiring a conservative central banker (Rogoff, 1985); central bank independence (Neumann, 1991); and central banker performance contracts (Waller, 1995, Walsh, 1995), among other options.

Since then, the “rules versus discretion” debate has become a “credibility versus flexibility” debate. Not only is this a change in the definition, it also prompted a change in policy conclusions. Indeed, an economic policy may be efficient in the “rules versus discretion” framework. With the inception of the credibility versus flexibility debate, an economic policy may not only be efficient, it may also be required to allow for flexibility in the face of economic adjustments due to exogenous shocks.

The following equation represents the impact on the unemployment rate of a certain degree of flexibility (noted by d) given to the central bank in order to respond to a non-anticipated exogenous shock:

$$u_t = \tilde{u} - \frac{1+d}{1+d+e} \mathbf{m} \quad (7)$$

This trend seems to allow economists to take a less doctrinaire position and employ a more scientific attitude in the face of the complexities of countries' economies.

In classical theory, money is neutral. It is only the numeraire in which prices are quoted. But this is also true for the New Classical School as Collignon (2005) recalls: “Money is neutral and can only be a disturbance, causing temporary deviations from the natural level, although political authorities may be tempted by ‘time inconsistent behaviour’ (Cukierman, 1992) to increase employment.”

The key question facing theorists is why this classical theorem of monetary neutrality fails to hold in the real world (Ball & Mankiw, 2002). According to Ball & Mankiw (2002), many answers have been proposed: imperfect information (Friedman, 1968, Lucas, 1973); long-term labor contracts (Fischer, 1977, Gray, 1976, Taylor, 1980); the costs of price adjustment (Mankiw, 1985, Rotemberg, 1982); and de-

partures from full rationality (Akerlof & Yellen, 1985). Thus, because of some market imperfections – and not only government failures –, changes in the value of the unit of account matter. In these types of conditions monetary neutrality breaks down, and at least in the short-run, monetary changes have opposite effects on inflation and unemployment (Ball & Mankiw, 2002).

Various aspects of the policy neutrality view can be found in Barro (1976), Lucas (1972), and Sargent & Wallace (1975). Since Kydland & Prescott (1977), the professional consensus seems to have shifted towards a more balanced view of the scope within which fiscal and monetary policy influences cyclical fluctuations – stabilization policy – and co-determines the nature of the long-run growth trend of the economic system (Buiter, 1980).

Nowadays, according to conventional macroeconomic theory, the inflation-unemployment trade-off is central to understanding not only the effects of monetary policy, but also the other policies and events that influence the aggregate demand for goods and services. The notion of natural rate of unemployment is, nevertheless, still to be refined, or yet questioned.

5. New challenges to the Natural Rate Hypothesis

The natural rate of unemployment is, in the early definition, the outcome of all the distortions created by government intervention. This definition evolved with the time inconsistency literature, since a government or a central bank can go below the natural rate by deciding on discretionary policy. Obviously there is a cost of doing so, and this cost is the inflationary bias.

Already in 1980, Buiter (1980) pointed out that the main assumption of the Monetarists was weak: money is not neutral, nor is monetary or fiscal policy. In a non-Walrasian framework, Buiter (1980) demonstrated that the natural rate hypothesis and its assumptions can be easily challenged, and further works were required to prevent any misleading conclusions in terms of monetary policy. Buiter (1980) relied on the existence of market imperfections and costly information to challenge

the rational expectations assumption (Akerlof, 1970, Salop, 1978, Stiglitz, 1979, Wilson, 1979). To Buiter (1980), there are real consequences of monetary and fiscal policy – anticipated and unanticipated.

Another set of arguments questioning the natural rate of unemployment challenges the idea of a steady natural rate. Hysteresis theories merely give one reason to expect the NAIRU to change over time. The NAIRU has followed a hump-shaped path in the US: it rose from the 1960s until about 1980, peaked around this time, and has been declining since then. There is empirical evidence that during the late 1990s in the US, the NAIRU declined substantially. To approximate the NAIRU, economists used the Hodrick-Prescott filter (Hodrick & Prescott, 1997). The estimated NAIRU was 5.4 percent in 1960, peaked at 6.8 percent in 1979, and fell to 4.9 percent in 2000 (Ball & Mankiw, 2002).

As underscored by Collignon (2005): “While unemployment in the US seems to have oscillated around a stable long term rate, the secular rise in European unemployment is explained by shifts in the natural rate. Social benefits and strong trade unions are supposed to be the cause of this rising unemployment. Policy proposals combating euro-unemployment focus on ‘structural reforms’ in goods and labour markets, although the results are rarely convincing Blanchard & Wolfers (2000). The gap between theory and practice indicates faults in theory.”

As empirical evidence revealed (Galbraith, 1997, Gordon, 1996), the natural rate was no longer fixed. While a stable NAIRU may still work for the US (Smyth & Easaw, 2001), the large fluctuations in Europe are incompatible with the stable NRH Blanchard & Summers (1988), Collignon (2002), Karanassou & Snower (1997), Solow & Taylor (1998), and Karanassou, Sala, & Snower (2003) show that the rise in EU unemployment in the 1970s and early 1980s was largely due to permanent shocks such as the decline in capital formation, while the increase of the early 1990s resulted from temporary shocks such as rising interest rates. Henry, Karanassou, & Snower (2000) sensibly observed a stable natural rate for the UK over the long run, but medium-run swings in unemployment due to transitory but long-lasting shocks. Haldane & Quah (1999) observed a similar pattern for the Phillips curve.

The question then is *how is the general equilibrium determined?* In other words, how is the structure of the economy affected? Can it be influenced by monetary policy when the natural rate of unemployment changes? An answer was provided by Collignon (2005) “Usually, the natural rate (or its correlate, the NAIRU) serves as a benchmark for monetary policy. If the capital market adjusts to the labour market, equilibrium unemployment will determine the natural rate of interest at which price stability is maintained. But if labour and capital market equilibria are determined simultaneously, the anchor for monetary policy disappears.” Thus, Collignon (2005) saw two issues for monetary policy: “first, if there is a rate of unemployment, below which inflation accelerates, and if the exact position of this natural rate is uncertain and moving, what interest level should be targeted by the central bank? Second, if it could be shown that the average rate of unemployment is affected by monetary policy, the natural rate cannot be exogenous and the neutrality hypothesis would not even apply in the long run.”

Challenges to the natural rate hypothesis go even farther: indeed, according to Collignon (2005) instead of one natural rate of unemployment, there may be multiple natural rates of unemployment: “if causation runs in the opposite direction and the *equilibria in the labour and capital market are simultaneously determined*, the dynamics of adjustment become richer and multiple ‘natural’ equilibria are possible (see also Dixon, 1995).

But the discretion side has also been revived by many authors who show that discretionary policy-making in a world with forward-looking agents is characterized by a “stabilization bias” (Svensson, 1997, Woodford, 1999). Indeed, money may be helpful in an inflation-targeting regime when the central bank acts under discretion. As shown by Woodford (1999), discretionary monetary policies provide a “stabilization bias” in the sense that the optimal discretionary policy rule is less inertial than the welfare-optimizing rule obtained under pre-commitment. Therefore, if commitments are not possible, assigning to the central bank a mechanism that makes discretionary policy more inertial may lead to better social outcomes (Soderstrom, 2005).

6. Conclusion

On its face, unemployment seems to be a concept easy to grasp. But when one looks closer, the intricacies are numerous and assumptions are multiple. It is, thus, no surprise to see that it takes every school of thought two decades to gather its arguments in order to challenge the predominant doctrine.

Nowadays, the New Classical School is a bit closer to New Keynesianism than ever before. It still has a strong footprint in Monetarism, since in the long run, there is no interest in stabilizing an economy. But unlike the Classical school, the New Classical School concedes that in the short run things are much more complicated.

If Keynes was right when he said, “in the long run, we are all dead,” one may even conclude that the New Classical School is far more Keynesian than it first appears.

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