LETTER

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TRÉSOR-ECONOMICS

Distinguishing cyclical from structural components in French unemployment

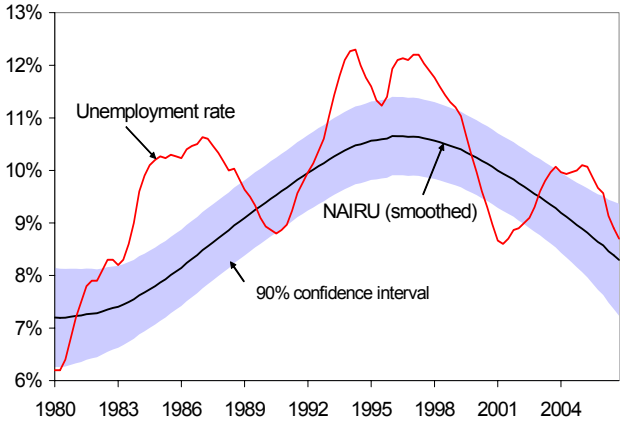
This study was prepared under the authority of the Treasury and Economic Policy General Directorate and does not necessarily reflect the position of the Ministry of the Economy, Finance and Industry.

- The French unemployment rate fall to 8.6% at the end of 2006, its lowest level since the second quarter of 2001. For the year as a whole, unemployment hasdeclined by around 1 percentage point: can we put this fall entirely down to a good economic situation, or does it also reflect sustainable improvements in the labour market?

- To answer this question we need to distinguish between cyclical and structural components in the actual unemployment rate. One fairly common approach is to look simultaneously at fluctuations in unemployment, inflation, expected inflation and energy prices. In this approach, based on the "expectations-augmented Philips curve", a fall in unemployment that is not accompanied by an unexpected rise in inflation (excluding any energy price effects) is interpreted as a fall in the structural component of unemployment (the non-accelerating inflation rate of unemployment, or the NAIRU), whereas a fall in unemployment accompanied by an unexpected rise in inflation is interpreted as a fall in the cyclical component of unemployment.

- Starting from this idea, using relatively simple statistical methods, we can calculate that the NAIRU for the fourth quarter of 2006 was around $8^{1/4}$% (with a hefty margin of uncertainty). Above all we can calculate by this means that it has fallen each year by around a third of a percentage point since 2000. It is further calculated that cyclical unemployment is currently low, thus limiting the effectiveness of demand policies in reducing unemployment and suggesting that further improvement will stem primarily from structural economic reforms.

NAIRU and unemployment rate in France (1980-2006)



Source: INSEE, DGTPE calculations

DGTPE
DIRECTION GÉNÉRALE DU TRÉSOR
ET DE LA POLITIQUE ÉCONOMIQUE

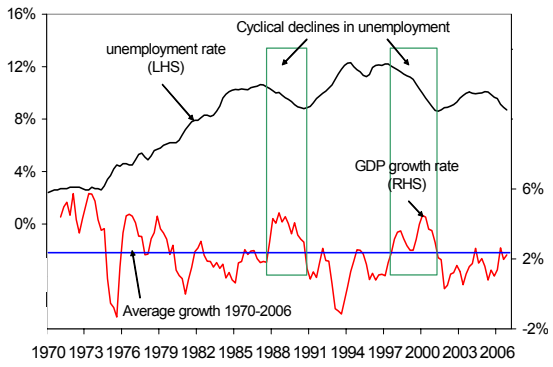
1. NAIRU and the trend-cycle breakdown of unemployment

1.1 The unemployment rate can be broken down into a component linked to the business cycle, and a longer-term component

It is especially important to distinguish between trend and cycle where unemployment is concerned, since the relevant policies for fighting unemployment differ considerably depending whether it is cyclical or structural. Over the past fifty years, consequently, the long-term, or structural, component of unemployment has come to be a major topic in the economic literature.

In the case of France, the coexistence of a cycle and a trend has been evident in the unemployment curve since the beginning of the 1970s[1]. While some fluctuations in the unemployment rate obviously flow from the position of the economy in the cycle, others, stretching over longer periods than the average length of a cycle, define a longer-term, or structural, trend in unemployment. Chart 1, for instance, shows that the fall in unemployment in the late-1980s coincided with a transitory upturn in the economy, when growth exceeded its average rate. Conversely, the rise in unemployment in the first half of the 1990s occurred against an adverse cyclical backdrop (with slowing growth). On the other hand, the uninterrupted rise in unemployment between 1970 and 1985 cannot be explained in terms of France's position in the economic cycle.

Chart 1: Unemployment rate and growth rate



Source: INSEE

Of the different concepts underlying the trend-cycle breakdown of unemployment, the "NAIRU" is undoubtedly the most commonly used.

1.2 The theoretical development of the NAIRU is closely bound up with the "history of the Philips curve"

In 1958, William Philips[2] identified a stable negative relationship between wages and the unemployment rate, based on UK data (1861-1957). The intuition behind this relationship was that, in periods of high (respectively low) unemployment, employees lose (respectively gain) wage bargaining power, which thereby slows (respectively speeds) growth in money wages. Consequently there is a rate of unemployment that is consistent with wage stability: Philips deduced from this the first estimate of equilibrium unemployment (5%). This observation places a responsibility on policymakers regarding a trade-off between unemployment and inflation. For, given the existence of a negative relationship between the two macroeconomic variables, one cannot reduce the one without being prepared to see the other to rise.

This was challenged in the 1960s. The idea that one could reduce long-term unemployment by raising inflation was deemed untenable, in particular by Friedman and Phelps (separately), since it assumes that agents never adjust their inflation expectations, even after inflation has risen several times. Friedman[3] himself quotes Abraham Lincoln: "You can fool all of the people some of the time, you can fool some of the people all of the time, but you can't fool all of the people all of the time." In the late-1960s Phelps-who won the Nobel Prize for this work in 2006-developed the theoretical framework lacking from Philips' approach[4]. His analysis emphasises agents' expectations, fitting these into the Philips curve, renamed the expectations-augmented Philips curve: the rate of unemployment therefore depends on the difference between inflation and expectations of inflation (and not inflation per se).

The message of the expectations-augmented Philips curve is that there is a short-term-and not a long-term-trade off between inflation and unemployment. More precisely the short-term trade-off is valid for given inflation expectations only. The unemployment rate consistent with a perfect expectation of inflation is known as the NAIRU (for Non-Accelerating Inflation Rate of Unemployment). When expectations are adaptive, i.e. inflation expectations depend on past inflation, the expected rate of inflation converges in the long term

(1) See Blanchard (2005) for a history of economic research on the dynamics of unemployment since 1970.
(2) Phillips A. W. (1958): "The relation between unemployment and the rate of change of money wage rates in the United Kingdom", 1861-1957. Economica, vol. 25.
(3) Friedman M. (1976): "Wage determination and unemployment", Chap. 12 of Price Theory, Chicago, Aldine Publishing Company.
(4) Phelps (1967): "Phillips curves, expectations of inflation and optimal unemployment over time", Economica, vol. 34, Phelps (1968): "Money-wage dynamics and labor market equilibrium", Journal of Political Economy, vol. 76, Phelps (1970): "Microeconomic Foundations of Employment and Inflation Theory", New York, W. W. Norton. For a description of Phelps' work, see the Presentation Speech for the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2006: "Edmund Phelps's Contributions to Macroeconomics" (Royal Swedish Academy of Sciences).

towards actual inflation and the unemployment rate progressively merges with the NAIRU[5].

The expectations-augmented Philips curve has continued to feature prominently in the economic literature as well as in the specialised press. It is used in particular to estimate the NAIRU both in institutional (OECD, the European Commission, Central Banks, etc.)[6] and academic circles. This is because, assuming it to be valid, the difference between inflation expectations and actual inflation indicates the position of unemployment relative to the NAIRU.

1.3 The theoretical foundations of the Philips curve

Although frequently interpreted as a simple empirical relationship, it is possible to derive the expectations-augmented Philips curve from a price-setting (PS) equation and a wage-setting (WS) equation[7] (see box 1 below).

It emerges, moreover, that the factors underlying the gap between unemployment and the NAIRU are temporary shocks on the one hand, and mistaken expectations (and/or the effects of nominal rigidities) on the other. In other words, one can view unemployment as the factor called upon to counter these effects and preserve the equilibrium in the short term.

1.4 The mechanisms reflected by the Philips curve

The underlying idea is that firms and employees agree on nominal wages, whereas what really interests firms and employees are real wages reflecting the cost of labour for firms and purchasing power for employees.

Box 1: **The Kalman filter**

The so-called WS-PS approach is based on two relations that involves real wages : The first one (WS for *Wage-Setting*) describes the wage setting process and the second one (PS for *Price-Setting*) the price setting process. As in Layard, Nickell et Jackman (1991), wage setting results from a negociation between firms and the trade union. Once respective interest have been maximised, this relation can be written :

$$w - p^a - eff = C_{WS} - \beta u \qquad (1)$$

where w is the nominal wage rate, p^a is the price expectation index, eff is the technical progress (work efficiency), u is the unemployment rate and C_{WS} reflects structural changes[a]. When the unemployment rate rises, the negociation power of workers drops (since the threat of unemployment is stronger) and thus they have to accept a decline in real wages. Moreover, firms pass onto prices changes in the cost of production factors (capital and labour). This mechanism is described in the PS equation (cf. Cotis, Meary et Sobczak, 1996):

$$p = C_{PS} + \alpha \left(w^a - eff\right) + (1 - \alpha)(c_k + p) \qquad (2)$$

where w^a is the expected nominal wage, c_k is the real cost of capital and α is the wage share in added value. Moreover, C_{PS} reflects the impact of structural changes over time (agents' preferences, the institutionnal framework...). With $\underline{u}$, the equilibrium unemployment rate, i.e. the unemployment rate when expectations are perfect, we have :

$$\underline{u} = \frac{1}{\beta}\left[C_{WS} + \frac{1}{\alpha}C_{PS} + \frac{1-\alpha}{\alpha}c_k\right] \qquad (3)$$

Thus, the equilibrium unemployment rate depends positively from factors that push wages and prices upwards (C_{WS} et C_{PS}) and from the cost of capital.

Under certain assumptions, the Phillips curve can be derived from the previous equations. We add to equations (1) et (2) $z_{WS,t}$ et $z_{PS,t}$ which represent short-term shocks affecting wages and prices respectively. Assuming that inflation expectation errors are identical to those of wage expectation, an expectations-augmented Phillips curve is obtained, re-writing the equation that gives the inflation rate $\pi_t = \pi_t^a + (p_t - p_t^a)$:

$$\pi_t = \pi_t^a - \frac{\beta\alpha}{2}(u_t - u_t^*) + \frac{\alpha}{2}z_{WS,t} + \frac{1}{2}z_{PS,t} \qquad (4)$$

where u_t^* is the NAIRU, defined as the unemployment rate consistent with the absence of temporary shocks and when prices and wages adjustements are made (i.e. when $z_{WS,t} = z_{PS,t} = 0$, $p_t^a = p_t$ et $w_t^a = w_t$).

a. For instance a change in taxes or social contributions, in the minimum wage or in the balance of negociation power between firms and trade unions other than those due to the fluctuations in the unemployment rate.

(5) This would be the case, however, if the economy suddenly ceased to be exposed to any kind of shock. Since that is not the case, unemployment fluctuates around NAIRU.

(6) Cf. Irac (2000): "Estimation of a time-varying NAIRU for France", *Banque de France NER no.75*, for the Banque de France; Fabiani and Mestre (2000): "Alternative measures of the NAIRU in the euro area: estimates and assessment", *ECB Working Paper no.17,* for the European Central Bank; Greenslade et al. (2003): "A Kalman filter approach to estimating the UK NAIRU", *Bank of England Working Papers no.179*, for the Bank of England; Denis et al. (2006): "Calculating potential growth rates and output gaps - A revised production function approach", *European Commission Economic Papers no.247*, for the European Commission; Richardson et al. (2000): "The concept, policy use and measurement of structural unemployment: estimating a time-varying NAIRU across 21 OECD countries", *OECD ECO/WKP(2000)23*, for the OECD.

(7) The introduction of expectation terms into the two equations leads this method to abandon this standard WS-PS approach (see Layard et al. (1991): "Unemployment, macroeconomic performance and the labour market", *Oxford University Press*).

What happens when inflation exceeds private agents' expectations? Due to the inflationary surprise, real wages are lower than either the firm or employees expected. This is a nasty surprise for employees, who must accept a lower than expected salary; and a pleasant surprise for firms, who end up paying their employees less than they had planned. They (the firms) will want to hire more workers, momentarily at least, thereby reducing unemployment. Conversely, if actual inflation is below expectations, the observed unemployment rate will be greater than the NAIRU.

This labour market functioning, in which nominal wages are decided before inflation is known, has important consequences at times of disinflation. Thus in a period of disinflation, if agents do not believe inflation will fall (which is what happens if, in each period, their inflation expectation is the last observed inflation), inflationary surprises will be continually negative, which in each period is reflected in an unemployment rate that exceeds the NAIRU (the "cost of disinflation"). If, on the other hand, the central bank is sufficiently credible for private agents to take its inflation forecast as their own, then the mere fact of announcing disinflation can shift inflation expectations along with the inflation outturn. In that case the cost of disinflation (in terms of unemployment) will be nil.

2. Estimating the NAIRU for France, and the long-term trend

2.1 The gap between actual inflation and expected inflation tells us about the position of the NAIRU relative to the unemployment rate

The NAIRU series is estimated via the expected effects of the "unemployment rate gap" (the gap between the unemployment rate and the NAIRU) on inflation, with no need to spell out its determinants explicitly.

Most estimates of this type use a Kalman filter (see Box 1). The NAIRU estimation methods using the Kalman filter are commonly referred to as semi-structural, since they blend statistical elements with economic ones. The theoretical starting point is an expectations-augmented Philips curve, assuming a stable relationship linking the gap between inflation and expected inflation on the one hand (the inflation gap in the following) and the gap between observed unemployment and the NAIRU on the other (the unemployment gap in the following). The model is presented in box 2 and needs to be completed by specification of the dynamics of the NAIRU. The latter generally takes the form of a random walk (with or without stochastic drift). Among estimates of this type we notably find those of Staiger, Stock and Watson (1996)[8], Gordon (1997)[9], Fabiani and Mestre (2000), and Laubach (2001)[10].

2.2 Various tests bear witness to the robustness of the estimation results

The estimation is made in two stages. Initially, the model's parameters (persistent inflation, the Philips curve slope, standard deviation of shocks, etc.) are estimated. Then, the filter is applied in order to extract the most likely unobservable variables over a given period. The estimation was conducted on quarterly data between Q1 1980 and Q2 2006.

Following the estimation, it is necessary to test the robustness of the estimation of the NAIRU series to various assumptions or modelling choices. In particular, the impact on results of three "ingredients" of the estimation was studied. These three elements are:

(a) certain constraints imposed on the parameters[11],

(b) the estimation period[12] and

(c) the assumption regarding the formation of inflation expectations[13].

It appears that the estimated NAIRU is relatively insensitive to changes in these three factors, which is evidence that the estimation is fairly robust.

2.3 After falling without interruption since 1996, the NAIRU is estimated at 8.3% for the last quarter of 2006

Chart 2 shows the smoothed NAIRU together with its 90% confidence interval. This confidence interval embraces two sources of uncertainty, namely uncertainty stemming from the method of filtering, and uncertainty over the model's parameters[14].

(8) Staiger, D., Stock, J. and Watson, M. (1996): "How Precise are Estimates of the Natural Rate of Unemployment?", *NBER Working Paper no.5477*.

(9) Gordon, R.J. (1997): "The Time-Varying NAIRU and its Implications for Economic Policy", *Journal of Economic Perspectives, vol. 11 (1)*.

(10) Laubach, T. (2001): "Measuring the NAIRU: Evidence from Seven Economies", *Review of Economics and Statistics, vol. 83 (2)*.

(11) In this type of estimation it is classic to have to impose constraints on the relationship between the variances of certain shocks which would otherwise be skewed to 0 (pile-up problem, see Gordon, 1997).

(12) The estimations were performed by shortening the period to Q1 1990-Q2 2006.

(13) In the basic model it is assumed that the inflation expectation for the following quarter is a linear combination of the most recent observed inflation rates. It is implicitly assumed that the weightings of this linear combination are constant over the whole period, which may seem debatable over a quarter century. Consequently, a more complex mode of formation of expectations, allowing progressive variations in weightings over the period (under the time varying parameter method, see Cooley T.F. and Prescott, E.C. (1976): "Estimation in the Presence of Stochastic Parameter Variation", *Econometrica, vol. 44*), has been tested. The estimated NAIRU series is therefore very little changed.

(14) Once the parameters of the model have been stated, the Kalman filter estimates the most "likely" unobservable variables. But this filtering is an estimation only, which means there is some uncertainty over the resulting series of unobservable variables. This uncertainty would subsist even if we were in possession of the "true" parameters . The fact that these last are also the result of an estimation is the source of a second type of uncertainty. Hamilton (1986): "A standard error for the estimated state vector of a state-space model", *Journal of Econometrics, vol. 33*, proposes a method based on Monte-Carlo simulations to obtain a confidence interval that takes both types of uncertainty into account.

Box 2: **The state-space model**

The Kalman filter is an econometric tool closely associated with state-space models. A state-space model is comprised of a set of equations defining the dynamics of two types of variables, namely observable and unobservable variables. Unobservable variables (typically, the NAIRU) affect the dynamics of observable variables (typically, inflation). Knowing both the equations defining the dynamics of the two types of variables and the changes in the observable variables over time, the Kalman filter allows us to estimate the most plausible NAIRU time series. Naturally, the results obtained are estimations only and thus characterised by a degree of uncertainty. One value of the Kalman filter is precisely that it makes it possible to measure the uncertainty surrounding the results.

The method is not flawless, however. In the first place, the lack of information about the structural factors underlying the NAIRU is an important limit to the approach. Consequently, it would be desirable to complete the diagnosis with a more structural approach (see Cotis et al., 1996, L'Horty and Rault, 2003, Heyer et al., 2004) seeking to determine explicitly the determinants of equilibrium unemployment. Second, whereas it is possible to quantify the error associated with the filtering technique and the uncertainty surrounding the parameters, the error associated with the choice of model (notably specification of the dynamics of the NAIRU) is not taken into account when calculating confidence intervals.

In a state-space model the dynamics of the (unobservable) state variables are described by transition equations and those of observable variables by measurement equations. In our case, the NAIRU is a state variable and inflation a measurement variable. The specifications we have used to model the dynamics of the NAIRU are of the same type as those used by Laubach (2001):

$$\begin{cases} u_t^* = \mu_t + u_{t-1}^* + \varepsilon_t^u \\ \mu_t = \mu_{t-1} + \varepsilon_t^\mu \end{cases} \qquad (2\text{-}1)$$

This modelling therefore implies that the NAIRU is integrated of order two[a]. This is coherent with empirical observations of a very high persistent rate of unemployment. The variable μ_t must capture trends in NAIRU variations[b]. Moreover, we have assumed that the gap ct between the observed rate of unemployment and the NAIRU is stationary and follows a self-regressive stationary process of order two:

$$c_t = u_t - u_t^* = \phi_0 + \phi_0 c_{t-1} + \phi_0 c_{t-2} + \varepsilon_t^c \qquad (2\text{-}2)$$

The Philips curve is written as follows:

$$\pi_t = \alpha_1 \pi_{t-1} + \alpha_2 \pi_{t-2} + \alpha_4 \pi_{t-4} + \alpha_6 \pi_{t-6} + \beta (u_t - u_t^*) + \gamma^{oil} z_{oil,t-1} + \gamma^{imp} z_{imp,t-2} + \varepsilon_t^\pi \qquad (2\text{-}3)$$

This formulation is known as Gordon's triangle (1997). It shows that the inflation is explained by three factors: (i) adaptive inflation expectations and inertia, (ii) excess or insufficient demand, expressed by the gap between the observed unemployment rate and the NAIRU, and (iii) temporary supply shocks, such as a rise in the real price of oil or real import prices[c].

As in most studies of this type, we have imposed a dynamic homogeneity on the equation by constraining to 1 the sum coefficients relating to inflation lags. This is referred to as an accelerationist Philips curve model.

Finally, the state-space model in its entirety is written as follows[d]:

$$\begin{cases} \pi_t = \underset{(3.5)}{0.35}\,\pi_{t-1} + \underset{(3.4)}{0.32}\,\pi_{t-2} - \underset{(1.4)}{0.12}\,\pi_{t-4} + \underset{(6.0)}{0.46}\,\pi_{t-6} - \\ \qquad\qquad \underset{(3.8)}{0.10}(u_t - u_t^*) + \underset{(2.0)}{0.001}\, z_{oil,t-1} + \underset{(2.9)}{0.04}\, z_{imp,t-2} + \varepsilon_t^\pi \\ u_t = u_t^* + c_t \end{cases}$$

$$\begin{cases} u_t^* = \mu_t + u_{t-1}^* + \varepsilon_t^u \\ \mu_t = \mu_{t-1} + \varepsilon_t^\mu \\ c_t = u_t - u_t^* = \underset{(1.4)}{0.02} + \underset{(31.5)}{1.79}\, c_{t-1} - \underset{(14.6)}{0.83}\, c_{t-2} + \varepsilon_t^c \end{cases} \qquad (2\text{-}4)$$

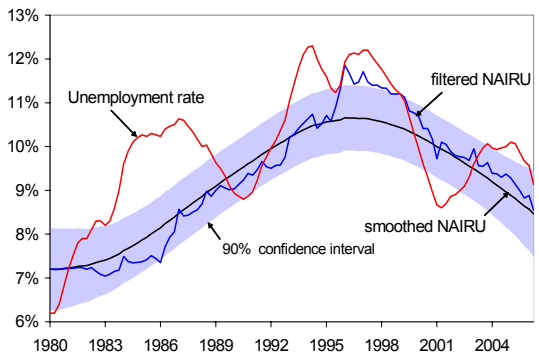
The importance of the parameter β, should be noted here, i.e. the slope of the Philips curve, in determining whether the estimated NAIRU is pertinent. This is because, when this parameter is statistically material, this means that the unemployment gap contributes materially to the change in inflation.

a. i.e. the second-order differences in unemployment are stationary.
b. This modelling may be considered pertinent in the light of trends such as the virtually uninterrupted upward trend in unemployment between the beginning of the 1970s and the late-1980s.
c. Only the first lag in second-order oil price differences ($z_{oil,\,t-1}$) and the second lag in second-order real import prices ($z_{imp,\,t-2}$) have a material impact on inflation.
d. Student's t in parentheses.

For the last available quarter (Q4 2006), we find, for example, that the estimated NAIRU is 8.3% and that its 90% confidence interval is [7.2%; 9.4%]. Since the observed unemployment rate for Q4 2006 is 8.7%, the cyclical component of unemployment at the end of the period amounts to 0.4 percentage points. The extent of the uncertainty concerning the estimation of the NAIRU, however, underscores the fragility of this evaluation of cyclical unemployment.

Chart 2 shows the changes in the NAIRU estimated according to two modalities of the Kalman filter. The "filtered" values (the blue curve) shown in the chart are obtained using only information available in each quarter t considered. When all available information (Q1 1980-Q4 2006) is used we can speak of "smoothed" NAIRU values. Insofar as the filtered values can be viewed as measurements of the NAIRU in real time, the gap between the two curves highlights the existence of substantial real-time measurement errors at certain moments (on the order of 1 percentage point at the end of the 1990s).

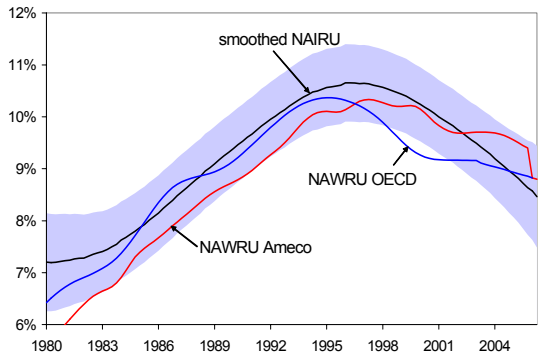
Chart 2: Estimation of the NAIRU and 90% confidence interval



Source: INSEE, DGTPE calculations.

Finally, we compare our NAIRU series with OECD and European Commission estimations[15] in Chart 3. These last two estimations are slightly different in nature, however, since they estimate the non-accelerating wage rate of unemployment (NAWRU) and correspond to the rates of unemployment compatible with the absence of downward or upward pressure on wages, and not on prices as with the NAIRU. The different estimations based on comparable methodologies yield similar results.

Chart 3: Estimation of the NAIRU and 90% confidence interval



Source: INSEE, DGTPE calculations.

2.1 The cyclical component of unemployment is small, is powerfully counter-cyclical, and has a positive effect on inflation

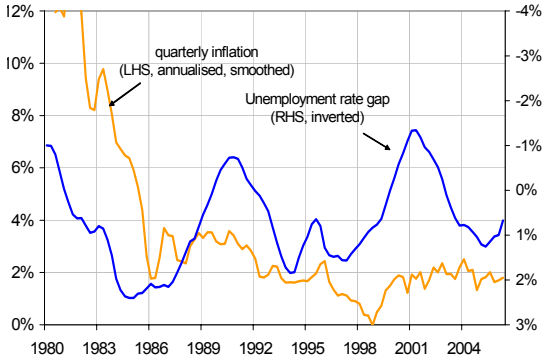
Given the dynamics of the unemployment gap, we can calculate that the standard deviation of the cyclical component of unemployment is around 1 percentage point: the unemployment gap is thus less than 2 percentage points in 95% of cases (or again less than 1.6 percentage points 90% of the time). In other words, the cyclical component of unemployment is fairly low relative to its structural component.

The unemployment gap is shown with consumer price inflation in Chart 4. It is thus possible to verify graphically that when the gap is positive (unemployment is greater than the NAIRU), inflation tends to fall. In particular, disinflation in the early-1980s went hand in hand with a positive unemployment gap due to persistent negative inflation surprises over the period.

Finally, in line with expectations, the unemployment gap (i.e. the gap between the observed rate of unemployment and the NAIRU) is very negatively correlated with the output gap (see chart 5)[16].

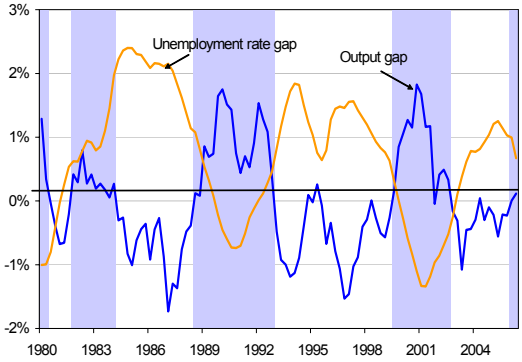
(15) The OECD data are taken from Economic Outlook, those for the European Commission from AMECO (Annual Macroeconomic Database).
(16) A Hodrick-Prescott filter (smoothing parameter: 1600) was used to estimate the output gap.

Chart 4: OECD and EU Commission estimations Smoothed NAIRU



Sources: INSEE,

Chart 5: Inflation and unemployment gap



Source: INSEE, DGTPE calculations.

3. How to account for changes in the NAIRU since the 1980s?

3.1 The method of estimation does not allow us to determine the factors driving the rise, and then the fall, of the NAIRU between 1980 and 2006

The method presented in this paper is statistical. In order to identify factors behind the evolution of structural unemployment since the 1970s, we need to look at it through economic theory: Blanchard (2005)[17] discusses the evolution of unemployment, and above all of our understanding of its fluctuations, over the past forty years. He recalls in particular the chief hypotheses advanced in order to explain the upward trend in unemployment to the point where it became durably established around the 10% mark in the 1990s.

3.2 The initial rise in the NAIRU, starting in the 1970s, stems from two types of adverse shock

There is now a consensus in ascribing the following two causes to the rise in unemployment starting in the 1970s, namely: the oil shocks of 1973-1974 and 1980 on the one hand, and the slowdown in the growth of global factor productivity on the other. Nominal and real wage rigidities, it is claimed, delayed the adjustment of wages to these two shocks, and the real rise in the cost of labour triggered a rise in unemployment as a result. Disinflationary monetary policies in the first half of the 1980s thereafter widened the unemployment gap. At the end of this period inflation had reached a relatively stable level, without any durable fall in unemployment being observed. From this it was concluded that the NAIRU too had reached a level close to 10% from the mid-1980s onwards, which implied that the impact of the two initial shocks was extremely persistent.

3.3 Three main mechanisms have been put forward in order to explain the NAIRU's strong persistence, namely: capital accumulation, the role of "insiders" in wage bargaining, and the phenomenon of hysterisis due to long-term unemployment

The first mechanism, capital accumulation, is expressed thus: if an initial drop in unemployment squeezes firms' profits to the point where the user cost of capital exceeds profit, then capital accumulation slows, thereby reinforcing the decline in employment. On this view, it is argued, the restrictive monetary policy pursued in the early-1980s had two negative effects on employment: (a) one via the resulting rise in real wages, and (b) the other via the rise in real interest rates, which slowed capital accumulation and durably reinforced the negative impact on employment.

The second mechanism is based on the idea that wages adjust weakly to negative shocks when negotiated exclusively by insiders (i.e. those in work), with the latter resisting any downward adjustment in their wages. In its most radical form, however, this idea has been countered by two arguments: first, insiders must consider the risk that they too could lose their jobs when bargaining. Second, employers too naturally play a part in the bargaining process, and they can threaten to hire jobless workers in place of insiders; this threat is all the more plausible when unemployment is high (see Layard, Nickell and Jackman, 1991)[18].

The third mechanism, known as hysterisis, was demonstrated by Layard and Jackman (1987)[19] based on European data. They showed that high levels of unemployment

(17) Blanchard, O. (2005): "European Unemployment: The Evolution of Facts and Ideas", *NBER Working Paper Series no.11750.*
(18) Layard, R. Nickell, S. and Jackman R. (1991): "Unemployment: Macroeconomic Performance and the Labour Market", *Oxford University Press.*
(19) Layard, R. and Jackman R. (1987): "The Labour Market. The Performance of the British Economy", *Clarendon Press, Oxford.*.

were accompanied by a rise in the average duration of unemployment. One of the problems with long-term unemployment is that it impairs the unemployed person's skills thereby reducing his employability. According to Blanchard (2005), the higher share of long-term unemployment could account for the greater persistence of the level of unemployment in Europe compared with the United States.

3.4 The factors responsible for the fall in the NAIRU from the mid-1990s onwards have yet to be fully identified

Among the main factors accounting for the fall in the NAIRU from the mid-1990s onwards, the literature mentions the cuts in social insurance contributions on low-paid workers, instituted in 1993 and then repeatedly reinforced in 1995, 1996, 1998, 2000, 2003 and 2004 (see Crépon et Desplatz, 2001, and Remy, V., 2005)[20]. Via an argument symmetrical to the one described above to explain the enduring impact of the disinflationary policy of the early-1980s on unemployment (the capital accumulation argument), it is explained that lower real interest rates have contributed to the NAIRU's decline over the past ten years (see Heyer, Reynès and Sterdyniak, 2004)[21].

Moreover, part of the fall in the NAIRU can be attributed to the structural reforms implemented in the 1990s. In particular the advent of the single European market and the introduction of a common currency helped to intensify competition in the market for goods, and may therefore have helped push down structural unemployment over this period (see OECD, 2000 and Nickell and Layard, 1999)[22].

For the recent period, however, there is no real consensus over a complete list of the determinants of the NAIRU and, a fortiori, over a quantification of their effects on unemployment (see Malinvaud, 2003 or Fougère, 2006)[23]. Only a more structural approach, of the WS-PS type[24], for example, might complete the analysis presented here.

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