SELECTED READINGS

Focus on: The NAIRU

September 2009

INTRODUCTION

The concept of NAIRU, Non-accelerating inflation rate of unemployment, has been introduced by Milton Friedman, in the sixties, when most of the economist were criticising the basis for the Phillips Curve.
The NAIRU is defined as the rate of unemployment when the rate of wage inflation is stable. It assumes that there is imperfect competition in the labour market where some workers have collective bargaining power through membership of trade unions with employers. And, some employers have a degree of monopsony power when they purchase labour inputs.

Therefore with NAIRU, the equilibrium level of unemployment is the result of a bargaining process between firms and workers.

If actual unemployment falls below the NAIRU, theory suggests that the balance of power in the labour market tends to switch to employees rather than employers. The consequence can be that the economy experiences acceleration in pay settlements and the growth of average earnings.

With other things being equal, an increase in wage inflation will cause a rise in cost-push inflationary pressure.

The following list is a non-exhaustive, subjective selection of publications dealing with NAIRU.

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1 WORKING PAPERS

1.1 Apel M., Jansson P., 1998, "A theory-consistent system approach for estimating potential output and the NAIRU", Economics Letters 74, 271-275.

A new approach is proposed for estimating potential output and the NAIRU. Identification is achieved using Okun's law and a Phillips curve. The performance of the methodology is exemplified using data from Canada, the UK, and the US.

Available at:
http://www.riksbank.com/upload/994/98nr74.pdf

1.2 Banque de France, 2002: "Croissance potentielle, positionnement de l'économie dans le cycle et tensions inflationnistes", Bulletin de la Banque de France Number 103.

Sur longue période, on observe une forte tendance à la réduction de l'amplitude des variations de l'inflation — mesurée par la croissance de l'indice des prix à la consommation. Ces variations ont été particulièrement fortes au cours des années suivant chacune des deux guerres mondiales et sur la période d'entre-deux-guerres (cf. graphique 1). Depuis 1960, l'inflation connaît des variations plus réduites entre les maxima (en moyenne annuelle) d'environ 13,5 % de 1974, 1980 et 1981 et le minimum d'environ 0,5 % de 1999. Sur les dix dernières années (1992-2001), elle a varié entre un minimum d'environ 0,5 % en 1999 et un maximum de 2,4 % en 1992. Au sein des pays qui composent l'actuelle zone euro, apparaît le même phénomène avec, de plus, une convergence progressive de l'inflation dans les pays à inflation relativement élevée, comme par exemple l'Italie, vers celle des pays à inflation relativement faible, comme l'Allemagne et la France (cf. graphique 2). Ainsi, depuis la constitution de la zone euro en janvier 1999, les écarts du glissement annuel de l'indice harmonisé des prix à la consommation entre les trois plus grands pays de la zone ne dépassent pas 1,3 point alors que, sur la dernière décennie, ils ont connu un maximum d'environ 5 points en 1995.

La période récente se caractérise donc, en comparaison avec les évolutions connues sur le dernier siècle, par une plus grande stabilité des prix, tant en France que dans la zone euro. Par la réduction de nombreux coûts qu'elle entraîne (coûts de « catalogue », « taxe inflationniste », incertitudes des anticipations…), cette stabilité est favorable à la croissance économique. Le rôle des autorités monétaires est de maintenir cette stabilité des prix 1. L'élaboration d'un diagnostic sur les risques inflationnistes est donc un enjeu crucial pour elles. Une voie possible de cette analyse est d'évaluer les tensions existantes sur les marchés des biens et du travail ou, d'une façon plus synthétique, les tensions existantes simultanément sur ces deux marchés. L'évaluation du niveau potentiel de production, de la croissance de ce niveau potentiel et de l'écart entre le niveau observé et ce niveau potentiel de la production permet une telle caractérisation des tensions.

Available at:
http://www.banque-france.fr/fr/publications/bulletin/bulbdf.htm

1.3 Bjørnland H. C., Brubakk L. and Jore A.S., 2007, "Forecasting inflation with uncertain output gaps", Empirical Economics, forthcoming.

The output gap (measuring the deviation of output from its potential) is a crucial concept in the monetary policy framework, indicating demand pressure that generates inflation. The output gap is also an important variable in itself, as a measure of economic fluctuations. However, its definition and estimation raise a number of theoretical and empirical questions. This paper evaluates a series of univariate and multivariate methods for extracting the output gap, and compares their value added in predicting inflation. The multivariate measures of the output gap have by far the best predictive power. This is in particular interesting, as they use information from data that are not revised in real time. We therefore compare the predictive power of alternative indicators that are less revised in real time, such as the unemployment rate and other business cycle indicators. Some of the alternative indicators do as well, or better, than the multivariate output gaps in predicting inflation. As uncertainties are particularly pronounced at the end of the calculation periods, assessment of pressures in the economy based on the uncertain output gap could benefit from being supplemented with alternative indicators that are less revised in real time.

Available at:
http://www.oekonomi.uio.no/memo/memopdf/memo1106.pdf

1.4 Blanchard O.J., Summers L.H., 1986, « Hysteresis and the European Unemployment Problem », NBER working paper Number 1950.

European unemployment has been steadily increasing for the last 15 years and is expected to remain very high for many years to come. In this paper, we argue that this fact implies that shocks have much more persistent effects on unemployment than standard theories can possibly explain. We develop a theory which can explain such persistence, and which is based on the distinction between insiders and outsiders in wage bargaining. We argue that if wages are largely set by bargaining between insiders and firms, shocks which affect actual unemployment tend also to affect equilibrium unemployment. We then confront the theory to both the detailed facts of the European situation as well as to earlier periods of high persistent unemployment such as the Great Depression in the US.

Available at:
http://www.nber.org/papers/w1950.pdf

1.5 Bloch. L., Henin P. Y., Marchand O., Meunier F., Thelot C., 1986, "Analyse macroéconomique des taux d'activité et flexion conjoncturelle", Economie Appliquée 1986 (4), 665-703.

No abstract available.
Available at:
http://genes.bibli.fr/opac/index.php?lvl=notice_display&id=38209

1.6 Bullard J.B. and Keating J.W., 1995, "The Long-Run Relationship between Inflation and Output in Postwar Economies ", Journal of Monetary Economics, Vol. 36, Issue 3, 477-496.

We investigate the relationship between inflation and real output in a large sample of postwar economies. Our methodology is to use a structural vector autoregression to estimate the response of the level of real output to permanent inflation shocks separately for each country. We find that a permanent shock to inflation is not associated with a permanent movement in the level of real

output for most countries in our sample. The main exceptions are certain low inflation countries, in which permanent inflation shocks permanently increase the level of output. We also find that permanent inflation shocks do not permanently influence real output growth rates in our sample.

Available at:
http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VBW-3YN9DR5-2&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=b1b36ad87fad4bd8a73a657377ae98df

1.7 Butter F.A.G. and Koopman S.J., 2001, "Interaction Between Structural Employment and Cyclical Shocks in Production and Employment", Review of World Economics, Vol. 137, Number 2, 273-296.

A major aim of recent empirical modelling of the business cycle is to identify the relative importance of aggregate supply and demand shocks. This paper uses the methodology of unobserved (or structural) components time series models for the identification of technology and demand shocks in a two-equation system of structural labour productivity and industrial output. It allows us to introduce the correlation between the structural and cyclical shocks such that the mutual dependency of these shocks can be estimated explicitly. The data is quarterly time series of labour productivity in industry and industrial output for Germany, the Netherlands, the United Kingdom and the United States. Our results show that the covariance of the dynamics of structural and cyclical shocks appears to be important in these countries.

Available at:
http://www.springerlink.com/content/w32938k31418506h/

1.8 Chagny O., Reynès F. and Sterdyniak H., 2002, "Le taux de chômage d'équilibre: discussion théorique et évaluation empirique", Revue de l'OFCE Number 81, April.

This paper examines the notion of « equilibrium rate of unemployment » (ERU). An « asymmetric » wage-price setting based on a wage Phillips curve and on a price equation in level leads to a clear distinction between medium and long run ERU, as to a kind of reconciliation between WS/PS and Phillips models. This paper proposes medium and long run ERU estimates for six countries (France, Germany, United Kingdom, Netherlands, Spain and United States), incorporating institutional variables. The evolution of the medium run ERU explain relatively well those of the actual unemployment rate until the late eighties. In the

nineties, the actual unemployment lies above its equilibrium level suggesting that an important part of the European unemployment is due to an excess supply.

Available at:
http://www.ofce.sciences-po.fr/pdf/revue/5-81.pdf

1.9 Chauvin V., Plane M., 2001, "2000-2040: Population active et croissance", Revue de l'OFCE N° 79, Octobre.

We explore the consequences of ageing on the French labour force. Baby-boom generations are going to leave gradually the labour market and will be partially replaced by younger ones. Differences in generations size will have an impact on the dependence ratio and therefore on the potential growth of output per head and on the balance of pension schemes. One of the remedy to labour force deficit could be an increase in participation rates, especially in the oldest and youngest. The progressive suppression of early retirement schemes could raise the participation rate of the oldest, while job-training association could increase the youngest one. According to our central projection, labour force would grow until 2016, before it will fall and reach in 2040 the level it has been in 2000.

Available at:
http://www.cairn.info/revue-de-l-ofce-2001-4-page-235.htm

1.10 Fabiani S., Mestre R., 2004, "A System Approach for Measuring the Euro Area NAIRU", Empirical Economics, Volume 29, Number 2, May 2004, pp. 311-341

This paper addresses the issue of measuring the NAIRU for the euro area and assessing the robustness and precision of the obtained estimates. The empirical framework adopted is based on systems combining an Okun-type relationship between cyclical unemployment and the output gap with a Phillips curve and stochastic laws of motion for the NAIRU and potential output. Such systems have been estimated using Kalman-filter techniques. The results obtained point to an estimate of the area-wide NAIRU that is robust to changes in the underlying models. This robustness is shown to hold both in terms of the mean – i.e., the shape of the resulting NAIRU – and the variance of the process. The latter is derived through bootstrap exercises using the models alone or pooled together. The evidence found suggests that the increase in the aggregate

NAIRU that took place in the early part of the sample period has come to a halt and may be about to be reversed.

Available at:
http://www.springerlink.com/content/qbtg6m0vpr29lyxy/

1.11 Gordon R. J., 1997, "The Time-varying NAIRU and its Implications for Economic Policy", Journal of Economic Perspectives, 11(1), 11-32.

This paper estimates the NAIRU (standing for the Non-Accelerating Inflation Rate of Unemployment) as a parameter that varies over time. The NAIRU is the unemployment rate that is consistent with a constant rate of inflation. Its value is determined in an econometric model in which the inflation rate depends on its own past values ('inertia'), demand shocks proxied by the difference between the actual unemployment rate and the estimated NAIRU, and a set of supply shock variables. The estimation in this paper applies to the US economy over the period 1955–96. The estimated NAIRU differs somewhat for alternative measures of the inflation rate. The NAIRU estimated for the GDP deflator varies over the past 40 years within the narrow range of 5.7–6.4%; its estimated value for the most recent quarter (1996:Q1) is 5.7%. In that quarter a lower NAIRU of 5.3% is obtained for the chain-weighted personal consumption expenditure (PCE) deflator. Recent research claiming that there is a three-percentage-point range of uncertainty about the NAIRU is rejected as inconsistent with the behaviour of the US economy in the late 1980s and early 1990s.

Available at:
http://www.nber.org/papers/w5735

1.12 Heyer E., Reynès F., Sterdyniak H., 2007, "Structural and reduced approaches of the equilibrium rate of unemployment, a comparison between France and the United States", Economic Modelling 24 (1), pp. 42-65.

This paper confronts, theoretically and empirically, two estimation methods for the Equilibrium Rate of Unemployment (ERU), which can be derived from a WS/PS model or from a wage Phillips curve. It shows how the TV-NAIRU reduced approach can be theoretically coherent with the structural approach even though their empirical diagnoses differ appreciably in the French case. It considerably improves the econometric and explanatory properties of the French

TV-NAIRU model by identifying some of its determinants (namely, inflation, labour productivity and real interest rates).

Available at:
http://www.sciencedirect.com/science/article/B6VB1-4KCXJMS-1/2/8b56fb6d7e1a7813d0bb3b4728fa1c10

1.13 Heyer E. and Timbeau X., 2002, "Le chômage structurel à 5% en France?", Revue de l'OFCE Number 80, January.

En partant d'un modèle espace-état standard, composée de la relation de Phillips en forme réduite, nous proposons dans cette étude un modèle enrichissant la dynamique, en distinguant explicitement NAIRU et chômage structurel. Ce modèle nécessite une estimation par le filtre de Kalman et s'apparente aux estimations de TV-NAIRU. À partir d'hypothèses raisonnables sur la variance des innovations affectant le NAIRU, nos estimations aboutissent à une évaluation du NAIRU habituelle pour la France, alors que la valeur du taux de chômage structurel est comprise entre 5 et 6 %, réconciliant la mesure du chômage structurel avec l'intuition du taux de chômage de « plein emploi ». Contrairement au modèle standard, qui exploite uniquement l'information contenue dans la courbe de Phillips, le modèle employé permet, par ailleurs, une validation empirique de quelques déterminants du chômage structurel. Ainsi, le dilemme inflation-chômage ne subsiste pas à long terme ; les taux d'intérêt réels de long terme jouent positivement sur le taux de chômage structurel (1 point de taux d'intérêt implique 0,5 point de chômage) ; la productivité joue négativement (1 point de productivité en plus abaisse le taux de chômage structurel de 0,5 point) ; le ratio salaire minimum sur salaire moyen joue positivement sur le taux de chômage structurel ; le taux de remplacement et le coin fiscalo-social n'influent pas. Cette liste reste néanmoins ouverte à d'autres facteurs, comme le niveau d'employabilité de la main-d'œuvre, qui ont un impact significatif sur la formation du chômage structurel.

Available at:
http://www.ofce.sciences-po.fr/pdf/revue/4-80.pdf

1.14 Jaeger A., Parkinson M., 1994, "Some evidence in Hysteresis in Unemployment Rates", European Economic Review 38(2), February, 329-342.

We propose an unobserved components model to evaluate unemployment data for evidence on hysteresis effects. Unemployment is decomposed into a natural rate component, assumed to be

nonstationary, and a cyclical component, assumed to be stationary. Hysteresis effects are modelled by allowing lagged cyclical unemployment to affect the current natural rate. The model is estimated using Canadian, German, U.K., and U.S. unemployment rate series. We find substantive hysteresis effects in the Canadian, German, and U.K. unemployment series. Hysteresis effects in the U.S. unemployment series are negligible.

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http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V64-45F63FK-BN&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=64cc05e9229f6fe51770fea312bc3788

1.15 King R. G., Stock J. H., Watson M., 1995, "Temporal instability of the unemployment-inflation relationship", Economic Perspectives of the Federal Reserve Bank of Chicago 19, 2-12.

Econometric modeling of the relationship between inflation and unemployment has been a central topic in macroeconomics since the investigation of Phillips (1958), who documented a negative correlation between these variables in a half-century of U.K. data. Since the simultaneous occurrence of high inflation and high unemployment in the United States and other countries during the 1970s, there has been general agreement that this econometric relationship is unstable. Indeed, the instability has been so great that Lucas and Sargent characterized it as "econometric failure on a grand scale."

(1) This article summarizes some results from our recent work that documents various dimensions of this instability.

(2) We display econometric instability in three alternative and complementary ways. First we look at the simple correlation coefficient linking the unemployment rate and inflation, which initially attracted the attention of Phillips (1958) in U.K. data and Samuelson and Solow (1960) in U.S. data. We show that this correlation has changed in an important way since World War II, so that over the entire 1954-94 period the correlation is essentially zero. However, we also show that this largely reflects the changing trend behavior of the two series: When we eliminate trends and high-frequency components of inflation and unemployment so as to focus on the business cycle behavior of the two series, we find that there has been a remarkably stable...

Available at:
http://www.chicagofed.org/publications/economicperspectives/1995/ep_may_june1995_part1_king_etal.pdf

1.16 Irac D., 2000, "Estimation of a time varying NAIRU for France", Note d'études et de recherche de la Banque de France 75.

Among the several concepts encompassed by the idea of an equilibrium rate of unemployment (labour mismatch, unemployment trend, non inflationary unemployment, structural unemployment), the NAIRU appears as the more interesting one for a central bank since it focuses directly on inflation. Thus, the paper considers the reduced Phillips equation, assuming a stable relationship between inflation and some kind of demand desequilibrium index, as the most promising starting point to estimate an equilibrium rate of unemployment. We adopt a semi-structural method based on a combination of an economic and a statistical approach. The Phillips equation we consider is very close to the so-called "triangle model" suggested by Gordon, where inflation rate is determined by three factors (hence the "triangle") : adaptive expectations and inertia, excess demand or shortage - estimated by the gap between the actual unemployment rate and the NAIRU - and supply shock variables. We regard the NAIRU as a time-varying parameter and estimate a state space model composed of a random walk process that describes its variations over time and of a Phillips equation. Under reasonable assumptions on the innovations to the NAIRU equation, the estimation of the state-space model (using Kalman filter techniques) yields empirical results for France that appear quite convincing: the time varying NAIRU we obtain accounts for the steady increase in the actual unemployment rate during the 1970s and the 1980s and offers the appropriate degree of smoothness. Working on the sample 1986-1999 the time varying NAIRU amounts to 10% in the second quarter of 1999 (with an interval confidence between 9% and 11%). The estimation of the model since 1970 gives information on the path followed by the NAIRU during the last decades. Whereas the NAIRU increased by 2.7 points between 1977 and 1988, its steady rise seems to slow down somewhat since the second part of the 1980s, exhibiting two main deceleration periods: first during the second part of the 1980s and second in the mid-1990s. Though this method exploits the set of information contained in the Phillips curve and provides fairly robust measures of the NAIRU, it gives little insight regarding its underlying determinants. It must therefore be completed by the analysis of the recent developments in French labour market. In the second part of this paper, we provide strong

evidence that the changes in the NAIRU in France during these two episodes may be linked to significant shifts in the demographic composition of the workforce together with a break in the evolution of the fiscal-social wedge. Several other factors (such as threshold effects in unemployment benefits or individual abilities) play probably a major role in unemployment variation.

Available at:
HTTP://WWW.BANQUE-FRANCE.FR/GB/PUBLICATIONS/TELECHAR/NER/NER75.PDF

1.17 Laubach T., 2001, "Measuring the NAIRU: evidence from seven economies", Review of Economics and Statistics 83(2), 218-231.

Several specifications of state-space models are used to obtain estimates of the NAIRU for the G7 except Japan, plus Australia, over the past 28 years. A Phillips curve-type regression is shown to deliver estimates that do not mimic low-frequency movements in unemployment rates, even when a drift is included in the specification of the NAIRU. Standard errors around the estimates are extremely large. Using information about the behavior of unemployment, in addition to inflation, alleviates both these shortcomings.

Available at:
http://www.mitpressjournals.org/doi/abs/10.1162/003465301511437 61?journalCode=rest

1.18 Lemoine M., Monperrus-Veroni P., Reynès F., 2007, "Nairu en zone heureuse", Revue de l'OFCE 101, April.

Cette étude spéciale propose des estimations du niveau non inflationniste du taux de chômage (Nairu) pour la zone euro agrégée, pour la France, l'Italie et l'Allemagne. Une équation d'inflation, qui dépend de l'écart du taux de chômage au Nairu, est estimée par le filtre de Kalman. Le modèle le plus simple, qui considère le Nairu comme une marche aléatoire, a des capacités prédictives limitées. Il diagnostique un taux de chômage inférieur au Nairu à l'horizon de notre prévision. Il est confronté à une deuxième version qui fait dépendre l'évolution du Nairu de celle du taux de chômage lui-même. Ce lien, vérifié empiriquement pour tous les pays, est parfois interprété comme un phénomène d'hystérèse. En identifiant un des déterminants du Nairu, ce modèle est mieux adapté en projection. De plus, cette spécification amène à des

prévisions sensiblement plus basses du Nairu de long terme, écartant à moyen terme le risque inflationniste.

Available at:
http://www.ofce.sciences-po.fr/pdf/revue/r101/r101-6.pdf

1.19 Logeay C., Tober S., 2003, "Time-varying Nairu and real interest rates in the Euro Area", DIW Discussion Papers 351.

This paper analyses the Nairu and the unemployment gap in the Euro Area and the influence that monetary policy had on their development. Using the Kalman-filter technique we find that the Nairu has varied considerably since the early seventies. Although other studies have found similar results, the report differs in that the Kalman-filter technique is applied for the first time using explicit exogenous variables, in particular real interest rates. This novel approach allows us to quantify the effect of changes in real interest rates on the Nairu. An increase in real interest rates by 1 percentage point was found to raise the Nairu by 0.3 percentage points, whereas the effect of changes in productivity turned out to be negligible and the effect of the wage wedge insignificant. A quarter of the increase in the Nairu between 1980 and 1995 can be attributed to the increase in short-term real interest rates, indicating the possibility of a long-run non-superneutrality of monetary policy. This hypothesis is supported by the correlation between nominal interest rates and unemployment in the Euro Area and in the United States and bivariate VAR tests for monetary superneutrality.

Available at:
http://www.eea-esem.com/eea-esem/2003/prog/getpdf.asp?pid=2005&pdf=/papers/eea-esem/2003/2005/Logeay_Tober_2003.pdf

1.20 Mc Morrow K., Roeger W., 2000, "Time-Varying Nairu / Nawru Estimates for the EU's Member States", European Commission Economic Paper 145.

The essential objective of the present paper is to produce statistically significant and economically reasonable, time-varying, NAIRU estimates (TV-NAIRU's) for the Community's Member States which also have informational content in terms of inflation. While it is clearly difficult to estimate NAIRU's using variables to cover all the main contributory factors which are likely to be at play, it may nevertheless be possible to isolate the principal "sinners" by selecting

a modelling strategy which is both theoretically robust and empirically respectful of a number of key predetermined criteria, including in particular the inflation tracking performance of the estimated NAIRU's / unemployment gaps.

Available at:
http://ec.europa.eu/economy_finance/publications/publication11124_en.pdf

1.21 Orphanides A., van Norden S., 2004, "The Reliability of Inflation Forecasts Based on Output Gap Estimates in Real Time", FEDS Working Paper Number.2004-68.

A stable predictive relationship between inflation and the output gap, often referred to as a Phillips curve, provides the basis for countercyclical monetary policy in many models. In this paper, we evaluate the usefulness of alternative univariate and multivariate estimates of the output gap for predicting inflation. Many of the ex post output gap measures we examine appear to be quite useful for predicting inflation. However, forecasts using real-time estimates of the same measures do not perform nearly as well. The relative usefulness of real-time output gap estimates diminishes further when compared to simple bivariate forecasting models which use past inflation and output growth. Forecast performance also appears to be unstable over time, with models often performing differently over periods of high and low inflation. These results call into question the practical usefulness of the output gap concept for forecasting inflation.

Available at:
http://www.federalreserve.gov/pubs/feds/2004/200468/200468pap.pdf

1.22 Passet O., Rifflart C., Sterdyniak H., 1997, "Ralentissement de la croissance potentielle et hausse du chômage", Revue de l'OFCE 60, pp. 147-186.

Depuis 1973, la croissance des pays industrialisés a fortement ralenti. Dans certains pays (Etats-Unis, Japon), le taux de chômage n'a pas été affecté. Au contraire, la quasi-totalité des pays européens ont connu une hausse tendancielle du chômage. Quelle est la part du ralentissement de la croissance qui s'explique par celui de la croissance potentielle ? Le taux de chômage d'équilibre a-t-il augmenté en Europe ? Cette augmentation est-elle une cause ou une conséquence du ralentissement de la croissance potentielle ? Cet article propose une synthèse théorique et empirique des liens entre croissance potentielle et chômage dans les pays industrialisés, et plus particulièrement en Europe.

La croissance potentielle peut être définie comme le niveau maximal de production soutenable sans accélération de l'inflation. Si certains cherchent à la mesurer par des méthodes purement statistiques, seule l'approche structurelle par des fonctions de productions explicites est satisfaisante. Sa mise en œuvre par les organismes internationaux aboutit à deux conclusions fortes pour l'Europe : la faiblesse de la croissance potentielle actuelle (de 2,1 à 2,3 % l'an) et le bas niveau de l'écart de production en 1995 (– 0,3 % pour la CE, – 1,5 % pour l'OCDE, – 2,2 % pour le FMI). Mais ces évaluations sous-estiment les disponibilités tant en ce qui concerne le facteur travail, que le facteur capital et le progrès technique.

Quatre causes peuvent être évoquées pour expliquer le ralentissement de la croissance potentielle: une baisse exogène du progrès technique (qui demeure largement inexpliquée dans les études empiriques, qu'elles soient fondées sur des modèles traditionnels de croissance ou sur les divers schémas de la théorie de la croissance endogène) ; les rigidités du marché du travail (qui expliquent que le ralentissement du progrès technique provoque une certaine hausse du chômage d'équilibre, mais celle-ci est inférieure à la hausse constatée du chômage), l'insuffisance de l'accumulation du capital (mais celle-ci n'a pas représenté une contrainte durable en Europe malgré la baisse de la profitabilité des entreprises) ; enfin, l'impact de la croissance effective sur la croissance potentielle. Selon nous, la croissance effective est en Europe depuis de nombreuses années inférieure à la croissance potentielle. L'actuel déficit de production est bien plus important que ceux couramment admis comme en témoignent la tendance à la déflation, le haut niveau de chômage, la faiblesse des hausses de salaires, la bonne situation financière des entreprises. La production potentielle n'est pas actuellement une contrainte à la croissance et à la création d'emplois en Europe. Cette zone souffre essentiellement du manque de dynamisme de sa demande, due à son incapacité à mettre en œuvre des politiques économiques appropriées.

Available at:
http://www.ofce.sciences-po.fr/pdf/revue/5-60.pdf

1.23 Richardson P., Boone L., Giorno C., Meacci M., Rae D. and Turner D., 2000, "The concept, policy use and measurement of structural unemployment: estimating a time varying NAIRU across 21 OECD countries'', OECD Economic Department Working Paper Number 250.

The structural rate of unemployment and associated non-accelerating inflation rate of unemployment (the NAIRU) are of major importance to the analysis of macro and structural economic developments, although in practice these concepts are not well defined and there is considerable uncertainty and controversy concerning their measurement and policy use. The present paper reviews a range of conceptual and analytical issues and related empirical studies to examine the usefulness and limitations of such concepts. A reduced-form Phillips curve approach is found the most suitable conceptual framework for representing the NAIRU as currently used by the OECD in its policy analysis and surveillance work. Three distinct classes of NAIRU concept are identified, distinguished by the time-frame in which they are defined, which map directly into the broad requirements for macro and structural policy analysis. In line with a number of recent empirical studies, this general approach is applied

Available at:
http://titania.sourceoecd.org/vl=898155/cl=18/nw=1/rpsv/workingpapers/18151973/wp_5lgsjhvj8334.htm

1.24 Turner D., Boone L., Giorno C., Meacci M., Rae D., Richardson P., 2001, Estimating the structural rate of unemployment for the OECD countries, OECD Economic Studies, Number2.

The paper first reviews the conceptual framework underlying different measures of structural unemployment as well as alternative empirical methods that have been used to provide estimates of them. Drawing on this review, it goes on to develop a method for estimating time-varying NAIRUs across a range of OECD countries using a Kalman filter. It then discusses the resulting econometric estimates, and the scope for their further refinement given the associated range of uncertainties. Recent trends in the NAIRU estimates are reviewed: they fell in many countries in the second half of the 1990s, although actual unemployment has remained well above the NAIRU for a majority of countries throughout much of the 1990s, particularly in Europe. Finally, the relevance of such measures to analysing inflation developments and monetary policy is discussed.

Available at:
http://www.ingentaconnect.com/content/oecd/02550822/2001/00002001/00000002/1301331ec006

1.25 Coe David T., "Nominal Wages. The NAIRU and Wage Flexibility," David T. OECD.org

No abstract available.
Available at:
http://www.oecd.org/dataoecd/59/19/33917832.pdf

1.26 Pichelmann K. and Schuh A. U., 1996, "The NAIRU-Concept: A Few Remarks", Wien Institute for Advanced Studies, Economics Series Number. 36

This note gives a brief survey of main theoretical and empirical issues with respect to the NAIRU concept. According to modern labour market literature NAIRU is defined as the rate of unemployment at which inflation stabilizes in the absence of any wage-price surprises. Conventional thinking about the equilibrium unemployment rate assumes that in the long run NAIRU is determined solely by supply side factors of the labour market. We show that quite complex adjustment dynamics may arise even in simple log-linear wage-price models. Furthermore we provide a survey on a number of "hysteresis-mechanisms" which could lead to permanent shifts of equilibrium unemployment over time, implying that an unique long run NAIRU may not even exist. In addition to theoretical issues we refer to two serious problems which might arise with empirical applications of the NAIRU concept. First various empirical studies suggest that results highly depend on model specifications. Second a considerable amount of statistical imprecision is inherent in the results obtained from empirical estimates. For these reasons, we argue, that policy conclusions drawn from the NAIRU concept must be judged with utmost care, particularly since in many countries a number of labour market measures as well as monetary policy are based on this concept.

Available at:
http://www.ihs.ac.at/publications/eco/es-36.pdf

1.27 Claar Victor V., 2006, "Is the NAIRU More Useful in Forecasting Inflation than the Natural Rate of Unemployment?", Applied Economics 38 (18): 2179-89.

Recent studies have indicated that the terms 'NAIRU & Close Curly Quote; (non-accelerating inflation rate of unemployment) and 'natural rate of unemployment & Close Curly Quote; are not interchangeable. While NAIRU is an empirical macroeconomic relationship estimated via a Phillips curve, the natural rate is an equilibrium condition in the labour market, reflecting the market's microeconomic features. This study evaluates comparatively the inflation-forecasting power of alternative time-varying estimates of the natural rate of unemployment relative to the NAIRU. The natural rate of unemployment in the USA since the Second World War is estimated. Three alternative methods are utilized: the Kalman filter, a structural determinants approach, and the Hodrick-Prescott filter. The section that follows assesses how each estimator of the natural rate compares with the others -- as well as with the NAIRU derived from a Phillips curve -- in forecasting inflationary changes in the USA in the second half of the twentieth century. The analysis reveals that the overall inflation-forecasting utility of the natural rate of unemployment relative to the NAIRU is not very different. Moreover, the conclusion appears to be quite robust to various estimators of the natural rate.

Available at:
http://www.informaworld.com/smpp/content~content=a758246437~db=all

1.28 "Unemployment, NAIRU and the Philips Curve," 2007, Biz/ed, 12 July 2007

No abstract available.
Available at:
http://www.bized.co.uk/learn/economics/macrocont/nairu/index.htm

1.29 . Hoover K. D., 2007, "Phillips Curve," The Concise Encyclopedia of Economics, The Library of Economics and Liberty.

No abstract available.
Available at:
http://www.econlib.org/library/Enc/PhillipsCurve.html

1.30 Gianella Ch., Koske I., Rusticelli E., Chatal O., 2008, "What Drives the NAIRU? Evidence from a Panel of OECD Countries", OECD Working Papers Number 649.

This paper analyses the determinants of structural unemployment rates in a two-stage approach. First, time-varying NAIRUs are estimated for a panel of OECD economies on the basis of Phillips curve equations using Kalman filter techniques. In a second stage, the estimated NAIRUs are regressed on selected policy and institutional variables. As predicted by theoretical wage-setting/price-setting models, the level of the tax wedge and the user cost of capital are found to be important drivers of structural unemployment. Consistent with earlier studies, the level of product market regulation, union density and the unemployment benefit replacement rate also play an important role in explaining changes in the NAIRU although there is considerable variation in estimates across countries. Nonetheless, the set of structural variables provides a reasonable explanation of NAIRU dynamics over the period 1978-2003, even though recent decreases are better explained than the earlier surge.

Available at:
http://www.sourceoecd.org/10.1787/231764364351

1.31 Dickens W. T., 2008, "A new method to estimate time variation in the NAIRU", Federal Reserve Bank of Boston, paper prepared for the conference "Understanding Inflation and the Implications for Monetary Policy, A Phillips Curve Retrospective".

No abstract available.
Available at:
http://www.bos.frb.org/economic/conf/conf53/papers/Dickens.pdf

1.32 Giorgio B., Lupi C., Ordine P., 1998, "Regional Disparities and the Italian NAIRU", Working Paper, Series: ETA - Economic Theory and Applications.

In this paper we estimate the Italian NAIRU using annual data for the period 1951-96. We find evidence consistent with aggregate wage setting in Italy depending only on the rate of unemployment prevailing in the Northern and Central areas of the country. There is evidence supporting the presence of a long-run cointegrating relationship among unemployment in the Northern and Central areas, the tax wedge, the real interest rate and a measure of union power.

The response of unemployment to exogenous shocks is sluggish, suggesting that persistence is an important feature of the Italian labor market.

Available at:
http://www.feem.it/Feem/Pub/Publications/WPapers/WP1998-071.htm?WP_Year=1998&WP_Page=1

1.33 Driver C., Hall S. G., 2007, "Production Constraints and the NAIRU", economics Discussion Paper 2007-41.

This paper argues that the production constraints in the basic NAIRU model should be distinguished by type: capital constraints and labour constraints. It notes the failure to incorporate this phenomenon in standard macro models. Using panel data for UK manufacturing over eighty quarters it is shown that capital constraints became relatively more important during the 1980s as industry failed to match the increase in labour flexibility with rising capital investment.

Available at:
http://www.economics-ejournal.org/economics/discussionpapers/2007-41/count

1.34 Stanley, T. D., 2002, "When All Are NAIRU: Hysteresis and Behavioural Inertia", Applied Economics Letters, Volume 9, Number 11, pp. 753-757(5).

Smyh and Easaw (2001) use a fully flexible ratchet model to estimate the US NAIRU. However, such flexible notions of NAIRU cleanse the natural rate hypothesis of all policy and theoretical relevance. Six successive years of unemployment rates below these estimated NAIRUs produce declining inflation, not the accelerating inflation promised by the natural rate hypothesis. An alternative model of inflation dynamics, the behavioural inertia hypothesis, is offered and shown to fit the US inflation-unemployment relation quite well. This behavioural inertia model is consistent with the recent US experience of low and falling unemployment accompanied by low and falling rates of inflation.

Available at:
http://taylorandfrancis.metapress.com/link.asp?id=101478

1.35 Ray C. Fair, 2000, "Testing the NAIRU Model for the United States", Review of Economics and Statistics, volume 82, issue 1, pp. 64-71.

This paper tests, using U.S. data, the dynamics implied by the NAIRU view of the relationship between inflation and the unemployment rate. The results are somewhat sensitive to the measure of inflation used, but they generally reject the dynamics. An alternative way of thinking about the relationship between inflation and the unemployment rate is suggested.

Available at:
http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.20.9083

1.36 Apel M., Jansson P., 1999, "System estimates of potential output and the NAIRU", Empirical Economics, Volume 24, Issue 3, pp. 373-388.

This paper proposes a new approach for estimating potential output and the NAIRU. The methodology models these key unobservable economic variables as latent stochastic trends within a trivariate system of observables comprising information on unemployment, GDP, and inflation. Identification is achieved through the use of a standard version of Okun's law and a Phillips curve. The performance of the procedure is investigated using Swedish quarterly data covering the time period 1970:1-1996:3.

Available at:
http://www.springerlink.com/content/vmlldkr8vcq80eaf/?p=e84cb3ce36144764b43d9374a8138a1e&pi=5

1.37 Bårdsen G., Nymoen R., "Testing Steady-State Implications for the NAIRU", Department of Economics, Norwegian University of Science and Technology, Working Paper Series Number 16/2002.

Estimates of the NAIRU are usually derived either from a Phillips curve or from a wage curve. This paper investigates the correspondence between the operational NAIRU-concepts and the steady state of a dynamic wage-price model. We derive the parameter restrictions that secure that correspondence. The full set of restrictions can be tested by econometric analysis of the wage price system, and this method is demonstrated for Norwegian data. A set of necessary conditions can be tested from estimated wage curves alone. Existing international evidence from empirical wage equations are re-interpreted in light of these conditions.

Available at:
http://www.svt.ntnu.no/iso/WP/2002/16nairu.pdf

1.38 Isard P., Laxton D., Eliasson A.-Ch., 2001, "Inflation Targeting with NAIRU Uncertainty and Endogenous Policy Credibility", IMF Working paper WP/01/7.

Stochastic simulations are employed to compare performance of monetary policy rules in linear and nonlinear variants of a small macro model with NAIRU uncertainty under different assumptions about the way inflation expectations are formed. Cases in which policy credibility is ignored or treated as exogenous are distinguished from cases in which credibility and inflation expectations respond endogenously policy credibility strengthens the case for forward-looking inflation forecast based rules relative to backward-looking Taylor rules.

Available at:
http://www.imf.org/external/pubs/ft/wp/2001/wp0107.pdf

1.39 Eduardo Arango L., Esteban Posada C., 2007, "Inflación y desempleo en Colombia: NAIRU y tasa de desempleo compatible con alcanzar la meta de inflación (1984-2005)", Borradores de Economia Number 453.

This paper carries out a new estimation of a time-varying NAIRU considering some labor supply components. Under this approach the average NAIRU is about 11,9% for the whole sample period. In addition, given the existence of an inflation target, we estimated a Phillips curve extended with an inflation expectations rule that considers this target. This estimation allowed us to compute the "compatible inflation target unemployment rate" (CITUR). Its average level is about 15% for period 1991-2005.

Available at*:*

http://www.banrep.gov.co/docum/ftp/borra453.pdf

1.40 Madsen, Jakob B, 1998, "Using panel data for the OECD countries over the period 1960-93", International Review of Applied Economics, volume 12, Issue 2, pp. 165-185.

This paper estimates the NAIRU, tests the restrictions implied by the NAIRU and estimates the extent to which the NAIRU is able to explain the low frequency movements in unemployment.

The results indicate that the long-run restrictions imposed on the NAIRU are not satisfied for many countries and that the NAIRU is unable to account for the low frequency movements in unemployment.

Available at:
http://www.informaworld.com/smpp/title~content=t713426883~db=all

1.41 Arabinda Basistha & Richard Startz, 2008, "Measuring the NAIRU with Reduced Uncertainty: A Multiple-Indicator Common-Cycle Approach", November 2008, Volume 90, Number 4, Pages 805-811.

Standard estimates of the NAIRU or natural rate of unemployment are subject to considerable uncertainty. We show in this paper that using multiple indicators to extract an estimated NAIRU cuts in half uncertainty as measured by variance and gives a 33% reduction in the confidence band. The inclusion of an Okun's Law relation is particularly valuable. The essential notion is the existence of a common cyclical force driving the macroeconomic variables. Model comparisons based on the use of Bayes factors favor the idea of a common cyclical component.

Available at:
http://www.mitpressjournals.org/doi/abs/10.1162/rest.90.4.805

1.42 Staiger D., Stock J.H., Watson M. W., 1997, "The NAIRU, Unemployment and Monetary Policy", Journal of Economic Perspectives, Issue 1, pp. 33-49.

This paper examines the precision of conventional estimates of the NAIRU and the role of the NAIRU and unemployment in forecasting inflation. The authors find that, although there is a clear empirical Phillips relation, the NAIRU is imprecisely estimated, forecasts of inflation are insensitive to the NAIRU, and there are other leading indicators of inflation that are at least as good as unemployment. This suggests deemphasizing the NAIRU in public discourse about monetary policy and instead drawing on a richer variety of leading indicators of inflation.

Available at:
http://www.jstor.org/pss/2138250

1.43 Hogan V., Zhao H., 2006, "Measuring the NAIRU – A Structural VAR Approach", UCD Centre for economic research, Working Paper series WP06/17.

We calculate the NAIRU for the U.S. in a framework where inflation and the unemployment rate can respond to each other. The NAIRU is defined as the component of the actual unemployment rate that is uncorrelated with inflation in the long run. Using a structural VAR approach, the NAIRU and core inflation can be estimated simultaneously. Our estimation results show that the NAIRU falls dramatically at the end of 1990s and the long run vertical Phillips Curve shifts back from 6.8 per cent before 1997 to 4 per cent afterwards.

Available at:
http://www.ucd.ie/economics/research/papers/2006/WP06.17.pdf

1.44 Basistha A., Startz R., 2004, "Measuring the NAIRU with Reduced Uncertainty: A Multiple Indicator-Common Component Approach".

Standard estimates of the NAIRU or natural rate of unemployment are subject to considerable uncertainty. We show in this paper that using multiple indicators to extract an estimated NAIRU cuts in half uncertainty as measured by variance. The inclusion of an Okun's Law relation is particularly valuable. We estimate the NAIRU as an unobserved component in a state-space model and show that using multiple indicators reduces both parametric uncertainty and filtering uncertainty. Additionally, our multivariate approach overcomes the "pile-up" problem observed by other investigators.

Available at:
http://www.be.wvu.edu/div/econ//work/pdf_files/04-07.pdf

1.45 Vincenzo Di Maro, 2002, "The Estimation of the NAIRU and the Effect of Permanent Sectoral Employment Reallocation. The Italian Evidence", Universita degli studi di Napoli Parthenope, Instituto di Studi Economici Working Paper Number 7. 2002.

This paper analyses the NAIRU making use of a cointegrated VAR and of Italian labour market data. We show that a cointegrated VAR represents a statistically adequate (using Aris Spanos's terminology) approach to the estimation of the NAIRU. This is an effective way to overcome several problems affecting standard structural approach. In particular the paper investigates

whether permanent employment shift across Italian industrial sector [measured by the Neumann and Topel (1991)'s employment-based dispersion index] has an effect on unemployment. Among the findings of this paper we emphasize that sectoral employment shifts affect unemployment both in the long- and in the short-term. Moreover, we find that the effect of sectoral reallocation on the unemployment rate occurs only after some delay.

Available at:
http://129.3.20.41/eps/em/papers/0207/0207001.pdf

1.46 Altig D., Gomme P., 1998, "In search of the NAIRU", Federal Reserve Bank of Cleveland Research Paper.

The relationship between the unemployment rate and the non accelerating inflation rate of unemployment (NAIRU) is presumed to be an inflationary bellwether, but recent inflation predictions based on it have not been successful. The authors explore the reasons for this failure and suggest that it may be time to replace the NAIRU.

Available at:
http://www.clevelandfed.org/research/commentary/1998/0501.pdf

1.47 Skott P., 2008, "Wage Formation and the (Non-) Existence of the NAIRU", Department of Economics, University of Aarhus, Working Paper Number 1998-16.

The influence of NAIRU theory on economic policy is both puzzling and unfortunate, especially in a European context. This paper shows that standard rationality assumptions and objective functions may fail to generate a well-defined NAIRU in a unionized economy. It then presents two simple models with endogenous wage aspirations. One version of the model produces a unique long-run NAIRU while the other implies the presence of aspiration-induced hysteresis in the employment rate. The hysteretic version seems preferable on theoretical grounds and - at a stylized level - this version also fits the empirical evidence better than the non-hysteretic version. The argument implies that an expansionary aggregate demand policy combined with temporary incomes policies may reduce European unemployment permanently without adverse inflationary consequences.

Available at:
ftp://ftp.econ.au.dk/afn/wp/98/wp98_16.pdf

1.48 Laurence Ball, 1996, "Disinflation and the NAIRU", NBER Working Papers Number 5520.

This paper asks why the NAIRU rose in most OECD countries in the 1980s. I find that a central cause was the tight monetary policy used to reduce inflation. The evidence comes from a cross-country comparison: countries with larger decreases in inflation and longer disinflationary periods have larger rises in the NAIRU. Imperfections in the labor market have little direct relation to changes in the NAIRU, but long-term unemployment benefits magnify the effects of disinflation. These results support `hysteresis' theories of unemployment.

Available at:
http://www.j-bradford-delong.net/pdf_files/Ball_Disinflation_NAIRU.pdf

1.49 Meyer L. H., Swanson E. T., Wieland V. W., 2001, "NAIRU uncertainty and nonlinear policy rules".

Meyer (1999) has suggested that episodes of heightened uncertainty about the NAIRU may warrant a nonlinear policy response to changes in the unemployment rate. This paper offers a theoretical justification for such a nonlinear policy rule, and provides some empirical evidence on the relative performance of linear and nonlinear rules when there is heightened uncertainty about the NAIRU.

Available at:
http://www.federalreserve.gov/pubs/feds/2001/200101/200101pap.pdf

1.50 Servaas Storm, C. W. M. Naastepad, 2008, "The NAIRU reconsidered: why labour market deregulation may raise unemployment", International Review of Applied Economics, Volume 22, Issue 5, pages 527 – 544.

According to the mainstream theory of equilibrium unemployment, persistent unemployment is caused mainly by 'excessive' labour market regulation, whereas aggregate demand, capital accumulation and technological progress have no lasting effect on unemployment. We show that the mainstream non-accelerating inflation rate of unemployment (NAIRU) model is a special case of a general model of equilibrium unemployment, in which aggregate demand, investment and endogenous technological progress do have long-term effects. It follows that labour market

deregulation does not necessarily reduce steady-inflation unemployment. Theoretically, if the decline in real wage growth claims owing to deregulation is smaller than the ensuing decline in labour productivity growth and in the warranted real wage growth, then in that case steady-inflation unemployment may increase. Empirical evidence for 20 Organisation for Economic Cooperation and Development (OECD) countries (1984-1997) indicates that the impact of labour market deregulation on OECD unemployment is zero, and possibly negative (causing a higher rate of unemployment).

Available at:
http://www.informaworld.com/openurl?genre=article&doi=10.1080/02692170802287490&magic=repec&7C&7C8674ECAB8BB840C6AD35DC6213A474B5

1.51 Ball L., N. Mankiw G., 2002, "The NAIRU in Theory and Practice", Harvard Institute of Economic Research, Discussion Paper Number 1963.

This paper discusses the NAIRU - the non-accelerating inflation rate unemployment. It first considers the role of the NAIRU concept in business cycle theory, arguing that this concept is implicit in any model in which monetary policy influences both inflation and unemployment. The exact value of the NAIRU is hard to measure, however, in part because it changes over time. The paper then discusses why the NAIRU changes and, in particular, why it fell in the United States during the 1990s. The most promising hypothesis is that the decline in the NAIRU is attributable to the acceleration in productivity growth.

Available at:
http://www.economics.harvard.edu/pub/hier/2002/HIER1963.pdf

1.52 Logeay C., Tober S., 2003, "Time-varying Nairu and Real Interest Rates in the Euro Area", DWI Berlin, Discussion papers Number 351.

This paper analyses the Nairu in the Euro Area and the influence that monetary policy had on its development. Using the Kalman-filter technique we find that the Nairu has varied considerably since the early seventies. The Kalman-filter technique is applied here for the first time using explicit exogenous variables. In particular real interest rates were found to explain a quarter of the increase in the Nairu between 1980 and 1995. This indicates the possibility of a long-run non-superneutrality of monetary policy.

Available at:
http://www.diw.de/documents/publikationen/73/40460/dp351.pdf

1.53 Franz W., 2005, "Will the (German) NAIRU Please Stand Up?", Center for European Economic research, Discussion Paper Number 03-35.

This paper deals with a critical assessment of the 'non-accelerating inflation rate of unemployment' (NAIRU) for Germany. There are quite a few obstacles to perceiving the NAIRU as an easy-to-use analytical instrument: the possibility of a non-vertical Phillips curve, the occurrence of shocks and hysteresis effects, and the (mis-)measurement of important variables, cointegration issues and a time variability of the NAIRU. A new attempt is made to estimate a NAIRU for Germany using direct measures of inflationary expectations. However, by any method, the NAIRU is very hard to determine and subject to considerable arbitrariness.

Available at:
ftp://ftp.zew.de/pub/zew-docs/dp/dp0335.pdf

1.54 Vogel L., 2008, "The Relationship between the Hybrid New Keynesian Phillips Curve and the NAIRU over Time", DEP Discussion Papers, Macroeconomics and finance series 3/2008.

New Keynesian models of the Phillips curve in the spirit of Galí and Gertler (1999) generally assume a short-run trade-off between inflation and a measure of excess demand due to nominal rigidities, while in the long run inflation is constant at the Non-Accelerating Inflation Rate of Unemployment (NAIRU). By contrast, Gordon (1997) in his "triangle model" of inflation models a time-varying NAIRU. We combine both approaches and estimate state-space models of the hybrid New Keynesian Phillips curve (NKPC), where excess demand is measured by the unemployment gap and the NAIRU is allowed to vary over time as in Gordon (1997). Moreover, inflation expectations are measured directly from surveys on households' inflation expectations and not instrumented for. Our model is estimated for the US, the UK, Italy and Spain and we find considerable variation in the NAIRU over time with NAIRU estimates significantly different from HP-filter derived measures such as usually employed in dynamic stochastic general equilibrium (DSGE) models. In contrast to GMM results for the hybrid NKPC, we find

that backward looking behaviour generally seems to be quantitatively more important for inflation than forward looking behaviour.

Available at:
http://www.wiso.uni-hamburg.de/hepdoc/macppr_3_2008.pdf

1.55 Batini N., Greenslade J., 2003, "Measuring the UK Short-Run NAIRU", External MPC Unit, Discussion Paper Number 12

This paper derives alternative measures of the short-run NAIRU (SRN) for the UK, the rate for unemployment at which inflation will neither increase nor decrease in the short-run. We estimate the NAIRU jointly with price equations by using the Kalman filter. Our work suggests that both structural changes in the labour market and favourable supply shocks may have had a beneficial impact on RPIX inflation over the last few years. We show that deviations of unemployment from the short-run NAIRU measures prove helpful in predicting inflation and we demonstrate their usefulness in Taylor-type policy rules for the interest rate.

Available at:
http://www.bankofengland.co.uk/publications/externalmpcpapers/extmpcpaper0012.pdf

1.56 Galbraith J. K., 1997, "Time to Ditch the NAIRU", Journal of Economic Perspectives, Volume 11, Issue 1, pp. 93-108.

The concept of a natural rate of unemployment, or non accelerating inflation rate of unemployment (NAIRU), remains controversial after twenty-five years. This essay presents a brief for no-confidence, in four parts. First, the theoretical case for the natural rate is not compelling. Second, the evidence for a vertical Phillips curve and the associated accelerationist hypothesis that lowering unemployment past the NAIRU leads to unacceptable acceleration of inflation is weak. Third, economists have failed to reach professional consensus on estimating the NAIRU. Fourth, adherence to the concept as a guide to policy has major social costs but negligible benefits.

Available at:
http://www.jstor.org/pss/2138253

1.57 Tulip P., 2000, "Do Minimum Wages Raise the NAIRU?", Federal Reserve Board, Finance and Economics Discussion Series, Paper 2000-38.

A high minimum wage (relative to average wages) raises nominal wage growth and hence inflation. This effect can be offset by extra unemployment; so the minimum wage increases the Non-Accelerating Inflation Rate of Unemployment or NAIRU.

This effect is clearly discernible and robust to variations in model specification and sample period. It is consistent with international comparisons and the behavior of prices.

I estimate that the reduction in the relative level of the minimum wage over the last two decades accounts for a reduction in the NAIRU of about 1½ percentage points. It can also account for the substantial reduction in the NAIRU in the USA relative to continental Europe.

Available at:
http://www.federalreserve.gov/pubs/feds/2000/200038/200038pap.pdf

1.58 Pollan W., 2008, "Incomes Policies, Expectations and the NAIRU", WIFO Working Papers, Number 314

Since the 19960s, several countries have adopted incomes policies in various forms to control inflation that had been interpreted as the result of a distributional struggle between business and labour unions. Recent writings on the NAIRU, however, ignore past policy interventions in the wage and price setting system, in the formation and propagation of inflation expectations, in particular. Some of the problems inherent in such an approach are illustrated in this paper by applying the standard tools of NAIRU analysis to the Austrian economy, an economy that has been subject to a variety of policy measures.

Available at:
http://www.wifo.ac.at/wwa/servlet/wwa.upload.DownloadServlet/bdoc/PRIVATE38558/WP_2007_314$.PDF

1.59 Stockhammer E., 2006, "Is the NAIRU theory a Monetarist, New Keynesian, Post Keynesian or a Marxist theory?" Vienna University of Economics & B.A., Department of Economics Working Paper Series Number 96.

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 traditions. 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.

Available at:
http://www.wu-wien.ac.at/inst/vw1/papers/wu-wp96.pdf

1.60 Estrella A., Mishkin F., 1998, "Rethinking the role of NAIRU in monetary policy: implications of model formulation and uncertainty", Federal Reserve Bank of New York, Research Paper Number 9806.

In this paper we rethink the NAIRU concept and examine whether it might have a useful role in monetary policy. We argue that it can, but success depends critically on defining NAIRU as a short-run concept and distinguishing it from a long-run concept like the natural rate of unemployment. We examine what effect uncertainty has on the use of NAIRU in policy. Uncertainty about the level of NAIRU does not imply that monetary policy should react less to the NAIRU gap. However, uncertainty about the effect of the NAIRU gap on inflation does require adjustments to the policy reaction function. Also, as in Brainard (1967), uncertainty about the effect of the monetary policy instrument on the NAIRU gap reduces the magnitude of the policy response. We estimate a simple NAIRU gap model for the United States to obtain quantitative measures of uncertainty and to assess how these measures affect our view of the policy reaction function.

Available at:
http://www.newyorkfed.org/research/staff_reports/research_papers/9806.pdf

1.61 Mestre R., Fabiani S., 2000, "Alternative measures of the NAIRU in the Euro area: estimates and assessment", European Central Bank Working Paper Series Number17.

The paper focuses on the measurement of the NAIRU (Non-Accelerating-Inflation-Rate-of-Unemployment) for the euro area and assesses the usefulness of different methodologies developed in the literature to estimate this unobservable variable at the aggregate level. After

reviewing the theoretical framework underlying the most common estimation approaches, it presents several estimates of the area-wide NAIRU based on a number of direct (or statistical) techniques. The latter range from simple univariate filtering approaches to more complex multivariate methods based on Phillips curve relationships. The different estimates of the aggregate NAIRU appear to be consistent and robust with respect to alternative specifications, methodologies and choice of the inflation indicator. They also show significant inflation forecasting ability and are able to produce sensible measures of the output gap, therefore providing some ground to argue that unemployment and the unemployment gap may be a useful variable to analyse short-term economic developments at the euro area level.

Available at:
http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp017.pdf

1.62 .Madsen J. B., 2005, "Empirical Estimates of the NAIRU", LABOUR, Volume 19 Issue 3, Pages 563 – 593.

Empirical studies have found that the non-accelerating inflation rate of unemployment (NAIRU) has been fluctuating in OECD countries around a constant mean of several percentage points over the past decades. This mean is calculated from the constant terms carried over from the wage and price growth equations. In this paper it is shown that a high proportion of the constant term is a statistical artefact and suggests a new method which yields approximately unbiased estimates of the time-invariant NAIRU. Using data for OECD countries it is shown that the constant-term correction lowers the unadjusted time-invariant NAIRU by approximately half.

Available at:
http://www3.interscience.wiley.com/journal/118709263/abstract?CRETRY=1&SRETRY=0

1.63 Greenslade J. V., Pierse R. G., Saleheen J., 2008, "A Kalman filter approach to estimating the UK NAIRU", Bank of England Working Paper Number179.

In this paper, the Kalman filter method is applied to UK Phillips-curve models and estimates are derived for the NAIRU from 1973 to 2000. The resulting profiles suggest that the NAIRU peaked around the mid-1980s and fell back thereafter. Structural changes in the labour market have reduced inflationary pressure from that source, and we suggest that temporary effects from real import prices and real oil prices were an important additional downward influence on

inflation in the latter half of the 1990s. Some of the uncertainties around our NAIRU estimates are shown. But, even though there may be uncertainty about exactly where the NAIRU is a variety of models suggest that unemployment was below the NAIRU for much of the second half of the 1990s.

Available at:
http://www.bankofengland.co.uk/publications/workingpapers/wp179.pdf

1.64 Camarero M., Josep Lluis Carrion Silvestre, Tamarit C., 2005, "Unemployment dynamics and NAIRU estimates for CEECs: A univariate approach", Espai de Recerca en Economia, Working Papers in Economics Number131.

In this paper we test for the hysteresis versus the natural rate hypothesis on the unemployment rates of the EU new members using unit root tests that account for the presence of level shifts. As a by product, the analysis proceeds to the estimation of a NAIRU measure from a univariate point of view. The paper also focuses on the precision of these NAIRU estimates studying the two sources of inaccuracy that derive from the break points estimation and the autoregressive parameters estimation. The results point to the existence of up to four structural breaks in the transition countries NAIRU that can be associated with institutional changes implementing market-oriented reforms. Moreover, the degree of persistence in unemployment varies dramatically among the individual countries depending on the stage reached in the transition process.

Available at:
http://www.ere.ub.es/dtreball/E05131.rdf/at_download/file

1.65 Stockhammer E., 2000, "Explaining European Unemployment: Testing the NAIRU Theory and a Keynesian Approach", Vienna University of Economics & B.A., Department of Economics Working Paper Series Number 68.

The aim of the paper is to contrast and test the NAIRU theory and the Keynesian theory of unemployment econometrically. For the former, wage push variables are keys in explaining the rise of European unemployment, for the latter accumulation is. The theories are tested using time series data for Germany, France, Italy, the UK and the USA, using the seemingly unrelated regression method (SUR). Unemployment benefits, union density and the tax wedge were used

as wage push variables, and the growth of business capital stock as the accumulation variable. The NAIRU specification performed poorly, with only the tax wedge having a positive effect on unemployment as predicted. The Keynesian approach was more successful, with accumulation being statistically significant in all countries. Moreover, the tax wedge and accumulation are fairly robust to changes in the specification and can be pooled across countries.

Available at:
http://www.wu-wien.ac.at/inst/vw1/papers/wu-wp68.pdf

1.66 Ansgar R., 2008, "Disinflation and the NAIRU in a New-Keynesian New-Growth Model", University Library of Munich, MPRA Paper Number 9346.

Unemployment in the big continental European economies like France and Germany has been substantially increasing since the mid 1970s. So far it has been difficult to empirically explain the increase in unemployment in these countries via changes in supposedly employment unfriendly institutions like the generosity and duration of unemployment benefits. At the same time, there is some evidence produced by Ball (1996, 1999) saying that tight monetary policy during the disinflations of the 1980s caused a subsequent increase in the NAIRU, and that there is a relationship between the increase in the NAIRU and the size of the disinflation during that period across advanced OECD economies. There is also mounting evidence suggesting a role of the slowdown in productivity growth, e.g. Nickell et al. (2005), IMF (2003), Blanchard and Wolfers (2000). This paper introduces endogenous growth into an otherwise standard New Keynesian model with capital accumulation and unemployment. We subject the model to a cost push shock lasting for 1 quarter, in order to mimic a scenario akin to the one faced by central banks at the end of the 1970s. Monetary policy implements a disinflation by following a standard interest feedback rule calibrated to an estimate of a Bundesbank reaction function. About 40 quarters after the shock has vanished, unemployment is still about 1.7 percentage points above its steady state, while annual productivity growth has decreased. Over a similar horizon, a higher weight on the output gap increases employment (i.e. reduces the fall in employment below its steady state). Thus the model generates an increase in unemployment following a disinflation without relying on a change to labour market structure. We are also able to coarsely reproduce cross country differences in unemployment. A higher disinflation generated by a larger cost push shock causes a stronger persistent increase in unemployment, the correlation noted by Ball. For a

given cost push shock, a policy rule estimated for the Bundesbank produces stronger persistent increase in unemployment than a policy rule estimated for the Federal Reserve. Testable differences in real wage rigidity between continental Europe and the United States, namely the presence of the labour share in the wage setting function for Europe with a negative coefficient but it's absence in the U.S. also imply different unemployment outcomes following a cost push shock: If the real wage does not depend on the labour share, the persistent increase in unemployment is about one percentage point smaller than in it's presence. To the extent that the wage setting structure is due to labour market rigidities, "Shocks and Institutions" jointly determine the unemployment outcome, as suggested by Blanchard and Wolfers (2000). We also perform a comparison of the second moments of key variables of the model with German data for a period ranging from 1970 to 1990. We find that it matches the data better than a model without endogenous growth but with otherwise identical features. This is particularly true for the persistence in employment as measured by first and higher order autocorrelation coefficients.

Available at:
http://mpra.ub.uni-muenchen.de/9346/

1.67 Koenig E. F., 2001, "What goes down must come up: understanding time-variation in the NAIRU", Federal Reserve Bank of Dallas, Working Papers Number 0101.

The behavior of inflation during the 1990s is consistent with the predictions of a model that assumes a constant long-run NAIRU and a constant long-run markup of output prices over unit labor costs. Within this framework, inflation fell during the late 1990s - despite low unemployment - chiefly because an unusually high markup allowed firms to increase wages without raising prices. As the markup returns to normal, the recent unusually favorable unemployment -inflation trade-off can be expected to deteriorate. More generally, movements in the markup induce persistent but ultimately temporary variation in the NAIRU.

Available at:
http://dallasfed.org/research/papers/2001/wp0101.pdf

1.68 Tobin J., 1998, "Supply Constraints on Employment and Output: NAIRU versus Natural Rate", Yale University, Cowles Foundation Discussion Papers Number1150.

NAIRU and NATURAL RATE are not synonymous. NAIRU is a macro outcome of an economy with many labor markets in diverse states of excess demand and excess supply. NAIRU represents an overall balance between the inflation-increasing pressures from excess-demand markets and the inflation-decreasing pressures from excess-supply markets. The natural rate, as described by Friedman, is a feature of Walrasian market-clearing general equilibrium. While the NAIRU fits into a Keynesian model, the natural rate is an aspect of a New Classical model. The determinants of the two are theoretically different, and so are their implications for policy. The NAIRU varies from time to time as the relationships between unemployment, vacancies, and wage changes vary, and as the dispersion of excess demands and supplies across markets changes. In this decade, these developments appear to be reducing the NAIRU, in contrast to the unfavorable circumstances of the 1970s.

Available at:
http://cowles.econ.yale.edu/P/cd/d11b/d1150.pdf

1.69 Nishizaki F., 1997, "The NAIRU in Japan: Measurement and Its Implications", OECD Economics Department, Working Papers Number 173.

The NAIRU is estimated by using the Japanese data. There are three major findings. The NAIRU has been increasing modestly since 1970. Unlike the standard specification adopted in many OECD countries it can be estimated more precisely when the unemployment rate with a several-quarter lead is used. Hysteresis or "speed limit" effects are also detected. These findings lead to the following implications. Structural reform in the labor market should be pursued. Seeking for alternative labor market indicators which move ahead of inflation will be useful. Macroeconomic policy aimed at rapidly reducing unemployment could be costly in terms of inflation.

Available at:
http://www.sourceoecd.org/10.1787/318484133467

1.70 Hein E., 2005, "Wage bargaining and monetary policy in a Kaleckian monetary distribution and growth model: trying to make sense of the NAIRU", Macroeconomic Policy Institute, IMK Working Paper Number 08-2005.

In a Kaleckian monetary distribution and growth model with conflict inflation we assess the role of a Non Accelerating Inflation Rate of Unemployment (NAIRU). The short run stability of a NAIRU is examined taking into account real debt effects of accelerating and decelerating inflation, and the short run effectiveness of monetary policy interventions applying the interest rate tool is analysed. The problem of long run endogeneity of the NAIRU is addressed integrating the long run distribution effects of monetary policies' real interest rate variations into the model. It is concluded that monetary policy interventions in order to stabilise inflation are either unnecessary or costly in terms of employment in the short run. In the long run, these policies bear the risk of continuously increasing the NAIRU in order to keep inflation under control, which yields a horizontal long run Phillips-curve and latent stagflation. Instead of relying on monetary policies, the cause of inflation should be directly addressed and wage bargaining co-ordination should be applied as an appropriate tool.

Available at:
http://www.boeckler.de/pdf/p_imk_wp_08_2005.pdf

1.71 Driver R. L., Greenslade J. V., Pierse R. G., 2006, "Whatever Happened to Goldilocks? The Role of Expectations in Estimates of the NAIRU in the US and the UK", Oxford Bulletin of Economics and Statistics, Volume 68, Issue 1, Pages 45-79.

During the second half of the 1990s the US economy was characterized as the Goldilocks economy: not too hot, nor too cold, but just right. It was argued that this represented a new paradigm, enabling unemployment to remain low without igniting inflationary pressure. We examine the evidence for a change in the relationship between inflation and unemployment for the US and UK using Phillips curve models. The impact of including explicit inflation expectations is also considered. Inflation expectations are found to play an important role, particularly in the US. When expectations are included there is still evidence that the non-accelerating inflation rate of unemployment (NAIRU) steadily declined during the late 1990s, although this decline in the US NAIRU is not found solely in the 1990s.

Available at:
http://www.blackwell-synergy.com/doi/abs/10.1111/j.1468-0084.2006.00152.x

1.72 Espinosa-Vega M. A., Russell S., 1997, "History and theory of the NAIRU: a critical review", Federal Reserve Bank of Atlanta, Economic Review Second Quarter 1997.

Economic commentators regularly urge the Fed to use the level of unemployment or the rate of change in wages as leading indicators of inflation and as guides to whether they should ease or tighten monetary policy. The logic behind this approach is based on modern (post-1970) Keynesian macroeconomics and, more specifically, on the Phillips curve and the non accelerating inflation rate of unemployment (NAIRU). This article attempts to provide some basic information about this NAIRU theory of the causes of inflation and the role of monetary policy. After describing the historical development of the NAIRU theory, the discussion raises some practical questions about the validity of the theory and its usefulness as the basis for policy advice. Perhaps the most important question involves the difficulty of distinguishing policy-induced changes in nominal wages that reflect future changes in the price level from changes in relative wages associated with real changes in the economy. The authors also describe recent developments in neoclassical theory that indicate that business cycle fluctuations in employment and output may be caused primarily by real forces-a situation that, if true, increases the danger that monetary policy based on the NAIRU may interfere with the proper functioning of the price system.

Available at:
http://www.frbatlanta.org/frbatlanta/filelegacydocs/ACFC1.pdf