

TESTING UNEMPLOYMENT THEORIES: A MULTIVARIATE LONG MEMORY APPROACH

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This paper investigates the empirical relevance of both the hysteresis and the natural rate hypothesis on unemployment in three major economies, namely the UK, the US and Japan, by estimating the degree of dependence in the unemployment series. Both univariate and multivariate long memory methods are used. The results vary depending on whether the former or the latter approach is followed. Specifically, when taking a univariate approach, the unit root null cannot be rejected in case of the UK and Japanese unemployment series, and some degree of mean reversion ($d < 1$) is found in the case of the US unemployment rate. When applying multivariate methods instead, higher orders of integration are still found for the UK and Japanese series, but the natural rate hypothesis cannot be rejected in the case of the US.

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I. Introduction

This paper investigates the empirical relevance of different unemployment theories in three major economies, namely the UK, the US and Japan, by estimating the degree of dependence in the unemployment series. For this purpose, it applies long memory methods and in particular, fractional integration techniques, which are more general than the standard approaches based on integer degrees of differentiation only considering the cases of stationarity $I(0)$ and nonstationarity $I(1)$. The existing empirical literature has either used univariate fractional integration or multivariate fractional cointegration methods for estimating the differencing parameter with parametric, semi parametric or non-parametric techniques; little attention has instead been paid to multivariate $I(d)$ processes, which allow for potential correlation among the variables of interest. In general, the unemployment rate follows the swings of the business cycle, therefore one would expect that the higher the degree of business cycle synchronization is the more correlated unemployment rates in different countries will be.

The present is a thorough study using both univariate and multivariate techniques. It shows that the results vary substantially depending on whether the former or the latter approach is followed, and that taking into account the correlations between the variables is crucial to estimate the degree of integration of the series accurately and therefore to obtain reliable evidence to discriminate between different unemployment theories.¹

The structure of the paper is as follows. Section II briefly reviews the main unemployment theories and what they imply for the degree of dependence of the data. Section III outlines the methodology. Section IV describes the data and discusses the empirical results, while Section V concludes the paper.

II. Unemployment theories

There are two main theoretical approaches to understanding the behaviour of the unemployment rate. The natural rate theory (see Friedman 1968 and Phelps 1967,

¹The natural rate (NAIRU) hypothesis (Phelps 1967 and Friedman 1968) claims that unemployment should converge to a natural rate in the long-run. If this hypothesis is correct, deviations from the natural rate will die in the short run. Blanchard and Summers (1987), however, argue that unemployment exhibits hysteresis, implying that economic shocks have permanent or very persistent effects on unemployment rates.

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