Can the hysteresis hypothesis in Spanish regional unemployment be beaten? New evidence from unit root tests with breaks

Alejandro García-Cintado [1], Diego Romero-Ávila *, Carlos Usabiaga [2]

Pablo de Olavide University, Department of Economics, Carretera de Utrera, Km. 1, 41013 Seville, Spain

ABSTRACT

This paper tests the hysteresis hypothesis in Spanish regional unemployment using quarterly data over the 1976–2014 period using a large battery of univariate unit root tests allowing for two breaks in the trend function of the series. The evidence strongly supports the hysteresis hypothesis for each of the 17 Spanish regions, since we consistently fail to reject the unit root null hypothesis. When the analysis is extended to allow for five structural breaks, the conclusion remains unaltered. The results call for policy measures to reduce the sluggishness in the adjustment of the labour market to adverse shocks.

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1. Introduction

The persistence of high unemployment rates in several developed countries, mainly European – see Alogoskoufis et al. (1995)–, since the first oil shock has been the subject of much debate over which paradigm can better explain the adverse behaviour of unemployment. The traditional natural rate theory –Friedman (1968) and Phelps (1967, 1968) – assumes that the unemployment rate fluctuates around some natural or equilibrium level which is set depending on fundamentals of the economy. While initially the absence of theories explaining the determination of the natural rate meant that in practice it was taken to be constant, subsequent developments have attempted to explain the structural factors responsible for the differences across economies and over time: labour productivity, technological change, real interest rates, real exchange rates and energy prices, to name a few — see Phelps (1994) and Phelps and Zoega (1998). According to the structuralist view – Phelps (1994)–, most shocks to unemployment are temporary, but infrequently the natural rate permanently changes, affected by variations in the aforementioned structural factors. As a consequence, the unemployment rate may be characterised as a process that is stationary around a changing mean.

As opposed to the natural rate and structuralist approaches, the hysteresis hypothesis implies that shocks can affect unemployment levels permanently. There are three main approaches explaining the sources of hysteresis: insider–outsider theory – see Blanchard and

Summers (1986, 1987) and Lindbeck and Snower (1988)–, long-run unemployment – see Layard et al. (1991), Pissarides (1992) and Blanchard and Diamond (1994)–, and capital scrapping – see Bean (1994).[3] The development of the two first lines of research explaining hysteresis in Spanish unemployment has produced a great amount of literature. While hysteresis is thought to imply that the natural rate is conditioned by past unemployment – see Karanassou and Snower (1997)–, persistence of unemployment which is a special case of the natural rate hypothesis entails a slow adjustment process of mean reversion. Thus hysteresis implies that unemployment is characterised by a unit root while persistence is characterised by a near unit root. In the latter case shocks to unemployment would have long-lasting but not permanent effects.

To discriminate among competing theories explaining the behaviour of unemployment rates, unit root tests have been widely applied. In essence, the hysteresis hypothesis has been formulated as a unit root process, and its rejection gives support to the natural rate hypothesis (if no breaks are included in the specification) or the structuralist hypothesis (if breaks are allowed for).

In a brief review of the empirical literature, we find three different groups of studies on the basis of the type of unit root tests employed. Chronologically, the first group applies traditional unit root tests, basically of the augmented Dickey–Fuller (1979) type — see, for instance, Alogoskoufis and Manning (1988), Andrés (1993) and Roed (1996) for OECD countries. Mostly, the evidence supports the hysteresis hypothesis for the EU economies and is mixed for the US. The seminal work of Perron (1989) shows that, in the presence of a structural break, standard unit root tests are biased towards the non-rejection of

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* Corresponding author. Tel.: +34 954348381; fax: +34 954349339.
  E-mail addresses: agcintado@upo.es (A. García-Cintado), dromtor@upo.es (D. Romero-Ávila), cusaiba@upo.es (C. Usabiaga).
  [1] Tel.: +34 954348994; fax: +34 954349339.
  [2] Tel.: +34 954348553; fax: +34 954349339.

[3] Andrés (1993) and Roed (1997) provide surveys on the theories of hysteresis.
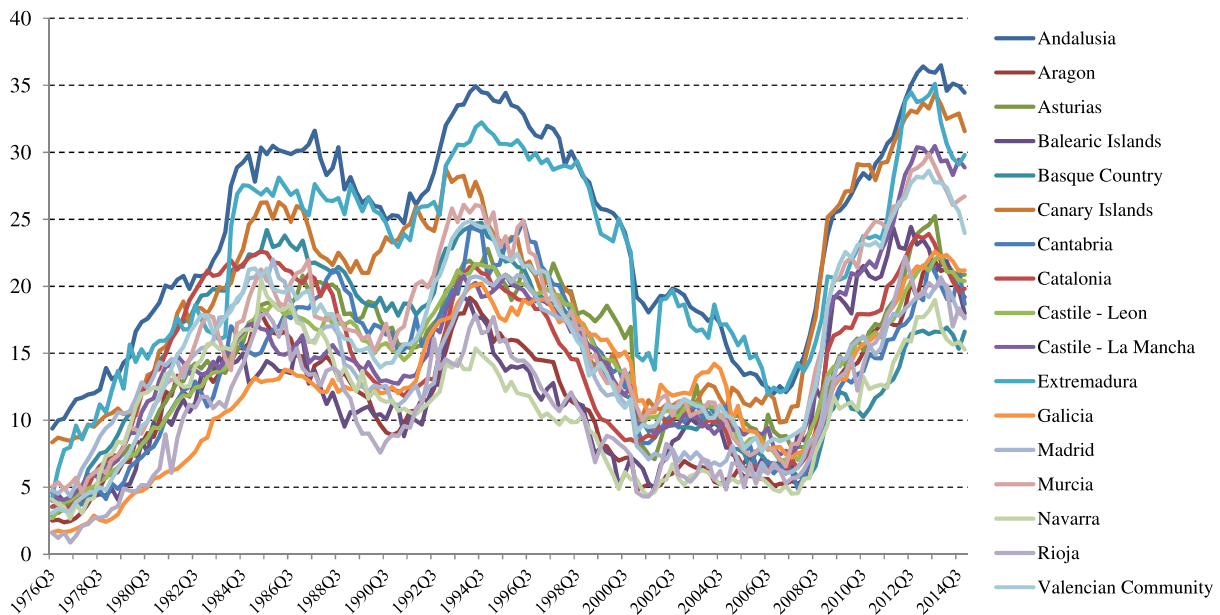
the null of a unit root, and has inspired an extensive research agenda on testing for unit roots allowing for structural changes. Among others, Zivot and Andrews (1992) and Perron (1997) develop tests which allow for one endogenous break, Lumsdaine and Papell (1997, LP) extend the Zivot and Andrews (1992) test for the case of two breaks and Lee and Strazicich (2003, LS) develop an endogenous two-break Lagrange multiplier (LM) unit root test that allows for breaks under both the null and alternative hypotheses. Among others, Mitchell (1993), Bianchi and Zoega (1998), Arestis and Biefang-Frisancho Mariscal (1999, 2000) and Papell et al. (2000) apply unit root tests that allow for structural breaks in the unemployment rate of OECD countries. Once structural breaks are considered, the null hypothesis of hysteresis is rejected in favour of the alternative of stationarity around a changing equilibrium rate for the majority of the countries analysed. A third group of studies are based on the recent panel unit root tests, which try to exploit the cross-sectional variation of the series. On the one hand, there is a group of panel unit root tests that do not allow for structural breaks – see, among others, Levin et al. (2002) and Im et al. (2003). On the other, we find more recent panel unit root tests that allow for one and two mean shifts – Murray and Papell (2000) and Im et al. (2005), respectively – as well as for multiple breaks – Carrión-i-Silvestre et al. (2005). In general, studies applying these techniques to unemployment rates for OECD countries, without allowing for structural breaks – Song and Wu (1998), León-Ledesma (2002) and Camarero and Tamarit (2004) – and, mainly, when structural breaks are allowed for – Murray and Papell (2000), Strazicich et al. (2001), Camarero et al. (2006) and Romero-Ávila and Usabiaga (2009)–, tend to reject, even stronger than in the case of univariate tests allowing for structural breaks, the null hypothesis of hysteresis in favour of the alternative of stationarity around a changing equilibrium rate. This result is even more evident for panels of the US regional unemployment rates for which the hysteresis hypothesis appears strongly rejected (Romero-Ávila and Usabiaga, 2007, 2009).

The high level of Spanish unemployment sustained over decades in relation to other OECD countries such as the US or Japan, or even in relation to other countries of continental Europe such as Germany or France also characterised by relatively high unemployment, has drawn great attention among scholars – see Blanchard and Jimeno (1995). As regards previous studies focusing on the Spanish unemployment

rate at the national level, we can highlight the following results: a) Without accounting for structural instability, Alogoskoufis and Manning (1988) and Andrés (1993) find evidence favouring the nonstationarity of the unemployment rate, while Roed (1996) provides mixed evidence. b) Accounting for structural instability, Arestis and Biefang-Frisancho Mariscal (2000), Papell et al. (2000) and Carrión-i-Silvestre et al. (2004) find evidence of hysteresis, while Arestis and Biefang-Frisancho Mariscal (1999) and Everaert (2001) find support for regime-wise stationarity accompanied with a high degree of persistence. To sum up, there appears to be overwhelming evidence of hysteresis. At the Spanish regional level, Romero-Ávila and Usabiaga (2008) employed the panel stationarity test of Carrión-i-Silvestre et al. (2005) to test for a unit root in the unemployment rate of the 17 Spanish regions over the period 1976–2004, finding strong evidence of nonstationarity in the unemployment rate across the 17 Spanish regions.

The aim of this article is to investigate from an additional perspective the time series properties of Spanish regional unemployment so as to determine which of the aforementioned theoretical paradigms most closely represents its behaviour. In doing so we advance the extant literature in testing for a unit root in unemployment rates by using the two state-of-the-art unit root testing procedures of Narayan and Popp (2009, 2010, NP) and Carrión-i-Silvestre et al. (2009, CKP), which allow for structural breaks under both the null and alternative hypotheses. A further advantage of using these tests versus other well-known tests such as those of LP and LS is that they outperform the latter in terms of size and power. In addition, the NP test is invariant to the magnitude of the break even in finite samples and exhibits the highest precision in the estimation of the break locations. To the best of our knowledge, this is the first time the NP and CKP tests are applied to testing for a unit root in unemployment. For comparison purposes, we also apply the widely-used two-break tests of LP and LS.

The evidence strongly supports the hysteresis hypothesis for each of the 17 Spanish regions, since we consistently fail to reject the unit root null hypothesis with the any of the testing procedures. When the analysis is extended to allow for five structural breaks with the Generalised Least Squares (GLS)-based unit root tests of CKP, this conclusion remains unaltered. This indicates that the hysteresis hypothesis in Spanish unemployment is a result that can be taken for granted in future studies involving this series since we failed to reject this hypothesis

Note: Own elaboration based on EPA data.

Fig. 1. Spanish regional unemployment rates.