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DIMITRIOS BAKAS

YOUSEF MAKHLOUF

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Tel: + 44 (0)115 848 3880

Can the Insider-Outsider Theory Explain Unemployment Hysteresis in OECD Countries?

Dimitrios Bakas [a,b] and Yousef Makhlouf [a]

[a] *Nottingham Business School, Nottingham Trent University, UK*
[b] *Rimini Centre for Economic Analysis (RCEA), Italy*

E-mail: dimitrios.bakas@ntu.ac.uk, yousef.makhlouf@ntu.ac.uk

Abstract

The insider-outsider theory has been commonly used to explain the hysteretic behaviour of unemployment. However, there is no empirical evidence about the validity of insiders' power on explaining the persistence of unemployment. This paper, using panel unit root tests that allow for the presence of covariates, addresses this gap and examines whether the insider-outsider theory, by means of various labour market proxies, can explain the hysteresis hypothesis for the OECD countries over 1960-2013. Our results show that although unemployment rate exhibits a pronounced hysteretic behaviour in OECD countries, this behaviour is reversed once we consider the insider-outsider proxies as covariates. This validates the role of insiders' power as a key source of unemployment hysteresis.

Keywords: *Insider-outsider theory, Hysteresis, Unemployment, Panel unit root tests*

JEL Classification: *C23, E24, J51, J64*

1. Introduction

An extensive strand of the literature tests the hysteresis in unemployment, a hypothesis which implies that any deviations of unemployment from its natural rate will be permanent, as suggested by Blanchard and Summers (1986, 1987). The empirical literature, however, provides mixed evidence. Whilst some studies have documented evidence of hysteresis, e.g. Mitchell (1993) and Bakas and Papapetrou (2014), others, such as Jaeger and Parkinson (1994), Arestis and Mariscal (1999) and Camarero and Tamarit (2004), provide evidence against. Noticeably, these studies examine the hysteresis hypothesis using alternative unit root testing techniques and/or different samples and pay no attention to investigate the sources of this phenomenon, which is important in addressing the persistence of unemployment.

The insider-outsider theory has long been used to explain hysteresis in unemployment (Lindbeck and Snower, 1988). According to this theory, people who remain employed, insiders, are able to secure wage increases for themselves and prevent the unemployed, outsiders, from competing wages down (Blanchard and Summers, 1987 and Song and Wu, 1998). Insiders' power reflects labour market rigidities and turnover costs which may affect the unemployment persistence level. Despite the widespread use of the insider-outsider theory as the key source of unemployment hysteresis, little is known about its validity empirically, and this is where our main contribution lies. To the best of our knowledge, this is the first empirical study that addresses this gap and evaluates whether the insider-outsider theory, proxied by the measures of trade union density (*Union*), coordination of wage-setting (*Coord*) and level of wage-bargaining (*Wbl*), can explain the persistence of unemployment rate in a sample of OECD countries over the period 1960-2013.

Theoretically, if labour market institutions turn to be more rigid, wages will start to increase. If this push in wages is not compatible with productivity, employment will tend to fall until the point that the higher unemployment in the economy will lead to a downward pressure on the wages that will offset the initial effect of the higher labour market rigidity. Thus, this mechanism can explain the impact of institutional rigidity on the natural rate of unemployment (Saint-Paul, 2004). However, most OECD countries have experienced changes in labour market rigidities over the last decades. For example, many European countries have faced a sharp increase in

unemployment benefits after the 1960s, while the employment protection legislation index has increased for most of the countries over this period (Nickell, 2003). Furthermore, there is significant heterogeneity of labour market rigidities across the OECD countries (Saint-Paul, 2004). Therefore, a series of studies have explored the relation between rigidities in labour market institutions and the rate of unemployment, and find that institutional rigidities play a vital role on explaining unemployment patterns and persistence (see for example Belot and Van Ours, 2001, 2004 and Nickell, 2003). Finally, an important dimension of this environment is the power of the insiders which can determine labour market rigidities in the economy (Lindbeck and Snower, 1988). This paper contributes to this strand of the literature by analysing the nexus between insiders' power, as a proxy of labour market rigidities, and unemployment persistence.

Our empirical framework extends the panel unit root tests to allow for the presence of covariates in the testing equation of the hysteresis hypothesis for unemployment. By doing so, we take into account the information that is contained in the insider-outsider covariates, and thus conduct a direct test for the insider-outsider theory. Our results show, first, that using conventional panel unit root tests we find evidence of hysteresis in unemployment for the OECD countries. However, this result is completely reversed, and the unit root in unemployment rate is strongly rejected, once we employ the panel unit root tests allowing for the insider-outsider covariates. This supports the insider-outsider theory as a key source of the hysteretic behaviour of unemployment.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 provides the empirical methodology, while Section 4 presents our empirical results. Finally, Section 5 concludes.

2. Data

We use annual data from 1960 to 2013 for a panel of 17 OECD countries.[1] This is the longest

[1] The 17 OECD countries in our sample are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States.

period for which the data for the labour market measures; trade union density, coordination of wage-setting and the level of wage-bargaining, are available.[2] The source of unemployment rate (*Un. Rate*) and trade union density (*Union*) is the OECD labour force statistics whilst the source of the coordination of wage-setting (*Coord*) and the level of wage-bargaining (*Wbl*) is the ICTWSS Database Version 5.1.[3] In addition, we have created the variable *Power* that consists the first principal component of the three labour market institution covariates (*Union, Coord and Wbl*). This aggregate measure encapsulates the insiders' power of the three proxies.

Trade union density is the trade union membership as a percentage of wage and salary earners in employment. Trade union activity, which only represents the insiders' interests, is considered as the most obvious source of insiders' power (Lindbeck and Snower, 1988, Layard and Bean, 1989 and Emmenegger, 2009). Moreover, we use two proxies of wage-bargaining level. The coordination of wage-setting is a discrete measure, ranging from 5 to 1, reflecting the degree of coordination from economy-wide bargaining to fragmented bargaining, confined largely to firm-level. In addition, the level of wage-bargaining is a discrete measure that represents the predominant level at which wage bargaining takes place, ranging from 5 (national or central level) to 1 (local or company bargaining level), see van Ours, 2015. The high wage-bargaining power of insiders increases the equilibrium rate of unemployment via boosting labour market rigidities (Saint-Paul, 2004). Additionally, bargaining power is positively associated with turnover costs thereby it strengthens the position of insiders relative to outsiders, which enhances the wage pressure and unemployment rate (Lindbeck and Snower, 1988 and Holmlund, 2014).

Figure 1 shows the evolution of the unemployment rate for the 17 OECD countries against the OECD average for the period 1960-2013. The figure shows the substantial heterogeneity of OECD labour markets. Saint-Paul (2004) illustrates that the observed divergence in unemployment rates across Europe is a real difference in labor markets rather than a statistical artifact since this divergence cannot be explained by obvious measurement issues such as different definitions of unemployment across countries.

[2] Minimum wages, labour turnover cost and employment protection legislation are other potential measures of the insider-outsider theory, however, the data for these factors are limited.

[3] We focus on these three proxies since the covariate panel unit root test of Pesaran et al. (2013) is available only for a maximum of three covariates.

Figure 1: Unemployment Rate for the 17 OECD Countries against the OECD Average

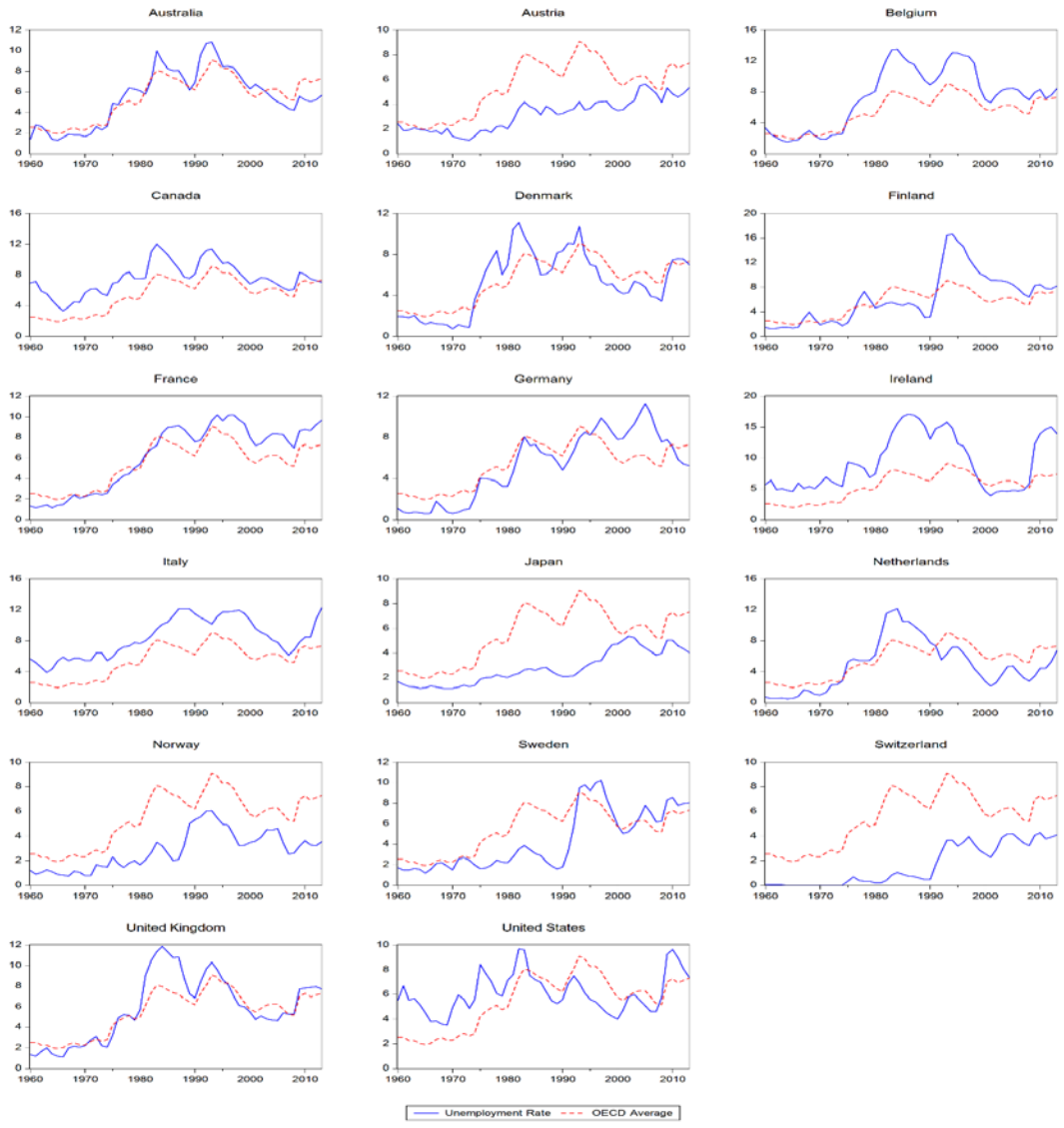

Table 1 presents summary statistics for the unemployment rate and the covariates for our panel. A high variation in all variables is evident, for example trade union density (*Union*) range from 7% to 84%. Furthermore, the average of both *Coord* and *Wbl* indicates that the wage-bargaining level, and thus the insiders' power, is relatively high in our sample.

Table 1: Summary Statistics

Variable	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*
Un. Rate	5.458	3.468	0.002	17.147
Union	41.041	18.904	7.548	83.863
Coord	3.314	1.412	1.000	5.000
Wbl	3.022	1.349	1.000	5.000
Power	0.000	1.449	-2.728	2.778

Note: Descriptive statistics for the OECD sample, based on N = 17 and T = 54 (TxN = 918 Obs).

Table 2 shows the correlation coefficients between the covariates and the unemployment rate. The high correlation between *Coord* and *Wbl* is anticipated since both covariates reflect the wage-bargaining level. The positive correlation between *Union* and wage-bargaining level proxies (*Coord* and *Wbl*) indicates that all three covariates operate in an analogous manner, i.e., they reflect the power of insiders relative to outsiders.

Table 2: Correlation Coefficients between Covariates

	Union	*Coord*	*Wbl*
Union	1		
Coord	0.473	1	
Wbl	0.570	0.736	1

Note: The numbers refer to the Polyserial or Polychoric correlation coefficient depending on the type of the variables.

3. Empirical methodology

To test for the hysteresis hypothesis (i.e., the null hypothesis of the presence of a unit root) in the dynamics of the unemployment rate in our sample, we rely on panel augmented Dickey-Fuller (ADF) unit root tests. Specifically, we use the *MW* test of Maddala and Wu (1999), the *CH* test

of Choi (2001), the *IPS* test of Im et al. (2003) and the *CIPS* test of Pesaran (2007), which accounts for cross-sectional dependence across the countries.

In the case where the null hypothesis of hysteresis in unemployment is not rejected, we proceed and explore the insider-outsider theory as source of the hysteretic behaviour of unemployment, by employing panel unit root tests that allow for the presence of various labour market proxies as covariates in the panel regression. To do so, we use two panel unit root tests proposed by Pesaran et al. (2013), the *CIPSM* and *CSBM* tests, which incorporate additional covariates in the augmented Dickey-Fuller panel regression and account for a multifactor error structure. Therefore, these tests can exploit the information contained in a number of additional covariates (the labour market proxies) that are assumed to share the common factors with the unemployment rate. Following Pesaran et al. (2013), we augment the ADF panel regression with the cross-section averages of the lagged levels and first-differences of the unemployment rate and the additional covariates. In particular, we employ the following ADF panel regression:

$$\Delta U_{i,t} = \alpha_i + \beta_i t + \phi_i U_{i,t-1} + \sum_{j=1}^{p} \delta_{ij} \Delta U_{i,t-j}$$

$$+ c_i \bar{U}_{t-1} + \sum_{j=0}^{p} d_{ij} \Delta \bar{U}_{t-j} + e_i \bar{Z}_{t-1} + \sum_{j=0}^{p} f_{ij} \Delta \bar{Z}_{t-j} + u_{i,t} \,, \quad (1)$$

where $U_{i,t}$ is the unemployment rate for for country *i* at time *t*, $\bar{U}_t$ and $\bar{Z}_t$ are the cross section averages of the unemployment rate and the measures of insiders' power respectively, with $\bar{U}_{t-1} = N^{-1} \sum_{j=1}^{N} U_{j,t-1}$ and $\bar{Z}_{t-1} = N^{-1} \sum_{j=1}^{N} Z_{j,t-1}$. Therefore, as suggested by Pesaran et al. (2013), the *CIPSM* test is based on the average of the individual cross-sectionally augmented ADF *t*-ratios for $\widehat{\phi}_i$ (t_{ϕ_i}) as follows:

$$CIPSM = N^{-1} \sum_{i=1}^{N} t_{\phi_i}(N,T) \,, \quad (2)$$

while, the *CSBM* test is based on the average of the cross-sectionally augmented Sargan-Bhargava statistics, given by:

$$CSBM = N^{-1} \sum_{i=1}^{N} CSB_{\phi_i}(N,T) \,, \quad (3)$$

with $CSB_{\phi_i}(N,T) = T^{-2} \sum_{t=1}^{T} \hat{u}_{it}^2 / \hat{\sigma}_i^2$, and where $\hat{u}_{it} = \sum_{j=1}^{t} \hat{\varepsilon}_{ij}$ and $\hat{\sigma}_i^2 = \sum_{\tau=1}^{T} \hat{\varepsilon}_{it}^2 / [T - (k+1)]$ and $\hat{\varepsilon}_{it}$ are the residuals from the regression of Equation (1).

Simulated critical values of both tests are listed in Pesaran et al. (2013). Both tests reject the null hypothesis of hysteresis in unemployment (i.e., the unit root null hypothesis) when the value of the statistic is less than the respective critical value. According to Pesaran et al. (2013), neither test shows any size distortions for combinations of *N* and *T*, whilst the *CSBM* test exhibits higher power compared to the *CIPSM* test for smaller *T*.

Our testing framework, thus, uses an augmented Dickey-Fuller panel regression with the inclusion of alternative measures of labour market (and possible combinations of them) as additional covariates to testing for unit root in the unemployment rate. In this way, a rejection of the null hypothesis of the presence of a unit root in unemployment rate will lead to the conclusion that hysteresis in unemployment is absorbed by the labour market covariates, and thus it can be explained by the insider-outsider theory. Therefore, the information contained in the proxies of the insider-outsider theory affects the power of the unit root test, indicating that the unemployment rate in OECD countries does not display hysteretic behaviour.

4. Results

Tables 3 and 4 present the results based on the alternative panel unit root tests for the unemployment rate without and with covariates, both in the case of an intercept and that of an intercept and a linear trend.[4] Specifically, Table 3 presents the results of the tests without the covariates: the *MW*, *CH*, *IPS* tests and the *CIPS* test that accounts also for cross-sectional correlation. All tests, clearly, do not allow us to reject the null of a unit root in the unemployment rate at the 5% level of significance, indicating that unemployment exhibits pronounced hysteretic behaviour for the panel of OECD countries.[5]

[4] Following Pesaran et al. (2013), we use the lag augmentation order for the panel tests according to $p = [4(\mathrm{T}/100)^{1/4}]$.

[5] This evidence is also confirmed by the individual ADF unit root tests for each country. These results show that for all countries we cannot reject the null of a unit root (with the exception of the version with trend where the results hold for the vast majority of the countries (i.e., 16 out of 17 countries)). This is a strong evidence of hysteresis for the OECD sample. These results are available from the authors upon request.

Table 3: Panel Unit Root Tests (without Covariates)

Un. Rate	*Without Trend*				*With Trend*			
	MW	*CH*	*IPS*	*CIPS*	*MW*	*CH*	*IPS*	*CIPS*
	28.770	-0.319	-1.612	-2.005	30.349	0.306	-2.133	-2.523

Notes: **, * indicate rejection of the null hypothesis of a unit root at the 5% and 10% significance level respectively. The lag order is selected according to $p = [4(T/100)^{1/4}]$.

Table 4 presents the results of the covariate panel unit root tests of Pesaran et al. (2013), *CIPSM* and *CSBM*, that allow us to control for the addition of the insider-outsider covariates (*Union, Coord and Wbl*). To explore the robustness of these tests to the choice of the additional covariates used in the ADF panel augmentation in Equation (1), we report the results of both *CIPSM* and *CSBM* tests using all possible combinations of the covariates (*Union, Coord and Wbl*), as well as using the first principal component of the three covariates (*Power*). In contrast to the previous outcome of the tests without covariates, the evidence based on the *CIPSM* covariate panel unit root test shows that the null hypothesis of a unit root in the panel is strongly rejected at the 5% (in 10 out of 16 cases) or 10% level (in 3 cases) for all possible covariates and for most of the alternative combinations of them. The only exceptions are in the case of using *Coord* as the additional covariate where the *CIPSM* test does not reject the null in both versions with and without trend, and the case where the two covariates (*Coord and Wbl*) are used in the version without trend, where the null cannot be rejected at the conventional levels of significance. The results based on the *CSBM* test are similar and reveal stronger evidence of rejection of the null hypothesis of hysteresis for all sixteen cases of choices of covariates.[6]

[6] Our results are robust to alternative sets of OECD countries. For example, we have explored the set of the 15 OECD countries used in Mitchell (1993) and Song and Wu (1998) with qualitatively similar findings. These results are available from the authors upon request.

Table 4: Panel Unit Root Tests (with Covariates)

Un. Rate		*CIPSM*		*CSBM*	
	Covariates	*Without Trend*		*With Trend*	
	Union	-2.824**	0.143**	-2.927**	0.080**
	Coord	-2.117	0.125**	-2.598	0.098*
	Wbl	-2.561**	0.137**	-2.667*	0.082**
	Power	-2.620**	0.140**	-2.733**	0.087**
	Union & Coord	-2.678**	0.144**	-3.020**	0.079**
	Union & Wbl	-2.716**	0.135**	-2.948**	0.073**
	Coord & Wbl	-2.545**	0.121**	-2.555	0.084*
	Union & Coord & Wbl	-2.477*	0.153**	-2.778*	0.074*

Notes: **, * indicate rejection of the null hypothesis of a unit root at the 5% and 10% significance level respectively. The critical values for the *CIPSM* test, in the case of one additional covariate, are -2.32 and -2.21 with an intercept only and -2.73 and -2.63 with an interept and a linear trend for the 5% and 10% significance levels, respectively. In addition, the critical values for the *CSBM* test, in the case of one additional covariate, are 0.238 and 0.264 with an intercept only and 0.097 and 0.104 with an interept and a linear trend for the 5% and 10% significance levels, respectively. The critical values for the *CIPSM* test (with two additional covariate) with an intercept only are -2.43 and -2.31 and with an interept and a linear trend are -2.80 and -2.68 for the 5% and 10% significance levels, respectively. The critical values for the *CSBM* test (with two additional covariate) with an intercept only are 0.207 and 0.231 and with an interept and a linear trend are 0.084 and 0.090 for the 5% and 10% significance levels, respectively. The critical values for the *CIPSM* test (with three additional covariate) with an intercept only are -2.49 and -2.37 and with an interept and a linear trend are -2.81 and -2.69 for the 5% and 10% significance levels, respectively. The critical values for the *CSBM* test (with three additional covariate) with an intercept only are 0.178 and 0.200 and with an interept and a linear trend are 0.072 and 0.078 for the 5% and 10% significance levels, respectively. The lag order is selected according to $p = [4(T/100)^{1/4}]$.

Overall, our results suggest that while we find a strong evidence of hysteretic behaviour of unemployment for the OECD countries when we use the panel tests without covariates, this result is completely reversed when we use the panel tests that allow for the insider-outsider covariates. The inclusion of the proxies makes the unemployment rate stationary, leading to the conclusion that the hysteretic behaviour of unemployment can be explained by the insider-

outsider theory. Insiders' power, thus, determines the level of unemployment persistence through labour market rigidities and turnover costs.

5. Conclusion

Despite the widespread use of insider-outsider theory to describe the hysteretic behaviour of unemployment, little is known empirically about its validity as a cause of this behaviour. Using three proxies of insider-outsider power, this paper investigates empirically the relationship between insider-outsider theory and unemployment hysteresis. To do so, we employ covariate panel unit root tests on a sample of 17 OECD countries over the period 1960-2013. Our initial findings provide evidence of hysteretic behaviour of unemployment for our sample. However, we find that the insider-outsider theory, proxied by the trade union density, the coordination of wage-setting and the level of wage-bargaining, can absorb the persistence of unemployment rate in OECD countries.

Our findings suggest that reforms towards lower labour market rigidities, such as lessening the power of insiders through limiting the role of trade union and/or reducing the wage-bargaining level, can lead to lower unemployment persistence.

This study focuses on the insider-outsider theory, however, future research can investigate empirically other potential sources of unemployment hysteresis suggested by the literature, such as intensity of job search, demoralisation, and employment protection. Finally, we have used three proxies of labour market rigidities associated with insiders' power due to data limitation, however, future studies can also test other factors that affects labour market rigidities such as labour turnover cost and employment protection.

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