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YOUTH UNEMPLOYMENT IN EUROPE:

PERSISTENCE AND MACROECONOMIC DETERMINANTS

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Abstract

This paper investigates the statistical features and the macroeconomic determinants of youth unemployment in a number of European countries. First, it explores its short and long memory properties by estimating both autoregressive and fractional integration models. This type of analysis sheds light on the degree of persistence of the series, and on whether policy actions are required for highly persistent series. Second, it investigates the main determinants of youth unemployment in Europe by estimating fractional cointegration models. The evidence suggests that this series is highly persistent in all the countries examined, and that in some of them there is a statistically significant long-run equilibrium relationship linking it to macroeconomic variables such as GDP and inflation.

Keywords: youth unemployment, fractional integration, fractional cointegration

JEL classification: C22, C32, J64

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coefficients. However, given the relatively small sample size in our case, a simple AR(1) specification is adequate to describe the short-run dynamics of the series.

The fractional integration framework can be extended to the multivariate case by estimating a fractional cointegration model. Specifically, we follow the approach developed in Gil-Alana (2003), which is a natural generalisation of the Engle and

and Spain, whilst evidence of mean reversion ($d < 1$) is found for Austria, Belgium, Denmark, France, Greece and Luxembourg.

[Insert Table 3 about here]

Table 3 focuses on the semiparametric results using three different bandwidth parameters. For each series there is at least one case when the unit root null cannot be rejected. Given the evidence of nonstationarity, the estimation was carried out using first differences, then adding one to the estimated values to obtain the integration orders. Overall, this evidence suggests nonstationarity and the presence of a unit root in all three series in all countries examined.

The following step is the estimation of a multivariate (cointegration) model. We started by including the same set of variables as in previous studies such as Jacobsen (1999), Blanchflower and Freeman (2000), Choudhry et al. (2012a). In particular, there is a large literature emphasising the impact of output (growth) on unemployment (the so-called Okun's law – see for example Lee, 2000, and Solow, 2000). Also, it appears that youth unemployment is even more sensitive to macroeconomic (and labour market) conditions than total unemployment (see Choudhry et al., 2012b). However, since regressors such as FDI and openness were found not to be significant, the results reported

Finally, we perform the Hausman test proposed by Marinucci and Robinson (2001). This is specified as follows:

$$H_{is} \quad 8\, s\ \hat{d}^{*} \quad \hat{d}_i^{\,2} \quad {}_{d} \quad {}^{2}_{1} \qquad \frac{1}{s} \quad \frac{s}{T} \quad 0, \qquad (7)$$

where i = x, y and zstands for each of the series under examination (youth

macroeconomic conditions (see Choudhry et al., 2012b). Of course a key role is also played by macroeconomic (as well as labour market) policies and institutions, as, for instance, stressed by the OECD (2006), but recommending the specific actions required to address the so-called “euro-sclerosis” (or poor employment performance of most European countries) is an issue beyond the scope of the present study, whose aim is simply to offer some evidence on the persistence of youth unemployment in Europe and its relationship with output and inflation.

References

Abadir, K.M., W. Distaso and L. Giraitis. 2007. Nonstationarity-extended local Whittle estimation. *Journal of Econometrics* 141: 1353-84.

Blanchard, O.J. and L.H. Summers, 1986, Hysteresis and the European unemployment problem, in NBER Macroeconomics Annual (Ed.) S. Fischer, MIT Press, Cambridge, Vol. 1., 15-78.

Blanchflower, D.G. and R. Freeman (2000), *Youth Unemployment and Joblessness*, University of Chicago Press, Chicago, IL.

Brunello, G., Garibaldi, P. and E. Wasmer (2007), Education and Training in Europe, Oxford University Press, New York, NY.

Caporale, G.M. and L.A. Gil-Alana (2013), "Persistence in youth unemployment", Empirical Economics Letters, 12, 3, 319-325.

Caroleo, F.E. and F. Pastore (2007), "The youth experience gap: explaining differences across EU countries", no. 41, Quaderni del Dipartimento di Economia, Finanza e Statistica, Universita' di Perugia, Perugia.

Choudhry, M.T., Marelli, E. and M. Signorelli (2012a), "Youth unemployment rate and impact of financial crises", International Journal of Manpower, 33, 1, 76-95.

Choudhry, M.T., Marelli, E. and M. Signorelli (2012b), "Youth and total unemployment rate: the impact of policy artd m A m , d pa φt `ofn da.

OECD (2005), Education at Glance, Paris.

OECD (2006), Employment Outlook, Paris.

Table 1: Estimated AR coefficients for each series in each country

Country	Youth unemploym.	Inflation	GDP
UNITED KINGDOM	0.838	0.683	0.586

Table 2: Estimatesof d and 95% confidence intervals for the individual series

Country	Youth unemployment	Inflation	GDP
UNITED KINGDOM	**1.37 (0.31, 2.10)**		

Table 3: Estimates of d based on a local Whittle semiparametric method

Country	Youth unemployment			Inflation			GDP		
	4	5	6	4	5	6	4	5	6
U. K.	**0.701**	**1.169**	1.453	**0.762**	**1.004**	**0.770**	**0.733**	**0.889**	**1.166**
ITALY	**1.386**	1,500	1.363						

U. K.

Table 4: Parameter estimates in the cointegrating relationship with uncorrelated errors

	d	A	β_1	B_2
UNITED KINGDOM	1.25 (0.47, 1.89)			-0.018 (-0.16)
ITALY	0.89 (0.73, 1.19)			
AUSTRIA	1.09 (0.71, 1.52)		-0.026 (-0.14)	0.013 (0.09)
BELGIUM	0.81 (0.29, 1.31)		-0.056 (-0.12)	-0.042 (-0.11)
DENMARK	0.89 (0.16, 1.46)			
FINLAND	1.98 (1.28, 2.91)		-0.263 (-0.80)	0.227 (1.51)
FRANCE	0.91 (0.43, 1.55)			-0.249 (-0.74)
GREECE	0.91 (0.54, 1.38)			

Table 6: Testing the null of no cointegration with the Hausman test of Robinson and Marinucci (2001) =

UNITED KINGDOM	ITALY	AUSTRIA
H_{xs}: = 11.449*	H_{xs}: = 23.104*	H_{xs}: = 0.025
H_{xs} = 5.475*	H_{xs} = 28.696*	H_{xs} = 0.585
H_{xs} = 2.601	H_{xs} = 0.064	H_{xs} = 2.140
d = 0.634	**d = 0.576**	d = 0.957