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It's wages, it's hours, it's the Italian wage curve

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Abstract
Using data from the Bank of Italy's Household Survey we find that a wage curve exists in Italy after the 1992-93 wage reforms for *annual* and *monthly* wages but not for *hourly* wages. Consistently, after the reforms we find a negative elasticity of annual hours and months worked with respect to the unemployment rate.

Keywords: Wage Drift, Panel Data, Unemployment

JEL Classification: J30, J60

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1. Introduction

In this paper we appraise the existence of an inverse relationship between individual wages and local unemployment across Italian regions. Since Blanchflower and Oswald (1994), empirical support has been found for this relationship (the *wage curve*) in many countries (Njikamp and Poot, 2005), Italy being somewhat an exception (Ammermüller et al. 2009). Italian centralized wage bargaining has often been blamed for this state of affairs, being deemed unable, at least until 1992, to allow for local labour market conditions. A sequence of reforms that took place in 1992 and 1993 abolished the automatic (partly flat-rate) cost-of-living allowance and introduced a new bargaining set-up, centred upon two specialized contractual levels. These reforms had two objectives: curbing the inflationary pressure, and making wages more responsive to local conditions. The first target has been undoubtedly achieved (Destefanis et al., 2005), while its effectiveness with respect to the second has been often doubted (Casadio, 2003).

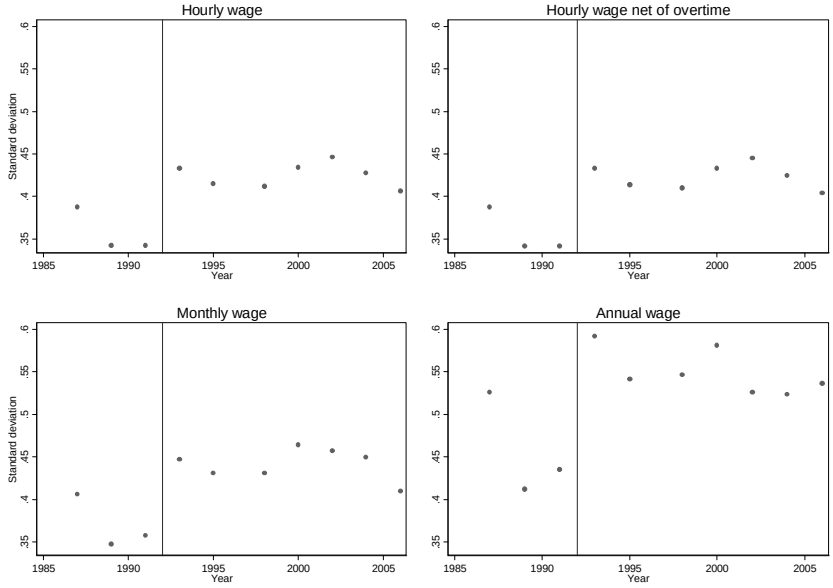

Figure 1: Wage dispersion in Italy

Figure 1 plots the standard deviation of various measures of Italian wages in recent years and shows that since 1993 wage dispersion increased markedly, suggesting that the reforms might have helped making wages more responsive to local labour market conditions. This is consistent with Devicienti et al. (2008) who provide evidence of the "resurrection" of the wage curve in Italy after the 1992-93 reforms, using weekly wages from social security records. However, Figure 1 also gives the visual impression that wage dispersion increased more for annual than for monthly and hourly

wages, suggesting that response to the reform might have partly taken place through adjustments in hours worked.

This paper explores this issue relying upon the Bank of Italy's Survey on Household Income and Wealth (SHIW) from 1987 to 2006, which includes information on the number of weekly hours and the number of months, on top of information on human capital characteristics of the individuals, such as education.

Consistently with Devicienti et al. (2008) we find that a significant inverse relationship between unemployment and both annual and monthly wages emerges in Italy after the 1992-93 reforms. However, we find no such relationship for hourly wages. Consistently, after 1992-93 we find a negative elasticity of average annual hours and months worked with respect to the unemployment rate. This suggests that, although the reforms were aimed at fostering wage flexibility, they rather helped making work hours more sensitive to local labour market conditions. Thus, Italy seems to be characterized by the presence of a "hours", rather than a wage, curve.[1]

2. The Data

We use a series of repeated cross-sections drawn from the SHIW, each of which is representative of the Italian population. Since 1987 the survey has been run every other year and contains data on economic and demographic characteristics of household members. It directly provides series for *annual* wages and also provides information on the number of months worked per year and hours worked per week. Therefore, the average number of annual hours can be calculated as *weekly hours* × *4* × *annual months*. Hourly and monthly wages follow readily:

hourly wages = annual wages / annual hours
monthly wages = annual wages / annual months

The canonical specification of the wage curve requires using hourly wages to eliminate the negative correlation between work hours and the unemployment rate (Card, 1995). Nevertheless, most empirical estimations of the wage curve are based on annual or monthly data (Nijkamp and Poot, 2005). This paper demonstrates the size of this effect for Italy using hourly, monthly and annual wages.

Our estimates refer to the period 1987-2006, the longest time span for which we have consistent series for wages, hours worked and unemployment. We restrict the analysis to private sector employees aged 18-65.

[1] Card (1995) stresses the potential relevance of this phenomenon. However, the relative importance of hours vs. wage adjustments has seldom been considered in the literature.

3. The Econometric Framework

We first estimate through OLS both a wage and a hours curve for individual *i* in region *r* at time *t*:

$$\ln(y_{irt}) = f_r + d_t + T_{rt} + b\, X_{irt} + \beta \ln(u_{rt}) + \beta_{post} \ln(u_{rt}) \times D_{post} + \varepsilon_{irt} \quad (1)$$

where y_{irt} is either the (annual, monthly or hourly) wage rate or the number of (weekly or annual) hours worked or the number of months worked; u_{rt} is the regional unemployment rate, also interacted with D_{post}, a dummy for the post-reform period; X_{irt} is a set of individual and market characteristics that includes gender, age dummies, education dummies, occupation dummies, sector dummies, a part-time dummy, a primary occupation dummy, city size dummies and the number of members of the household that do not perceive income. A full set of year dummies d_t controls for aggregate macro shocks, whereas regional fixed effects f_r control for time-invariant regional characteristics. Thus, any permanent component of the relationship between y_{irt} and regional unemployment is controlled for and the coefficients β and β_{post} only reflect the temporary component of the relationship. As region-specific wage pressure is likely to vary systematically both over time and across regions, we include region-specific time trends T_{rt} (Bell et al., 2002). We cluster standard errors at the regional level to account for within-region correlation of shocks.

We also adopt an alternative estimation procedure that adjusts for composition effects using a two-stage approach (Bell et al., 2002). We first take a separate cross-section regression for each year, pooling individuals across all regions. The same regressors as in the previous equation are included. For each year *t* we estimate:

$$\ln(y_{irt}) = a_{0t} + a_{rt} + b_t\, X_{irt} + \eta_{irt} \quad (2)$$

Once this equation is estimated, the region-specific time effects $\hat{a}_{rt}$ are used as composition-corrected *y*'s in a second-stage regional panel model that includes year dummies and regional trends. Notice that the *b* coefficients are the same across regions but vary over time. This allows for accurate composition correction over a period where industry and skill effects have become increasingly dispersed.

5. Results

The upper panel of Table 1 shows results from the estimates of the wage curve for hourly, monthly and annual wages using pooled OLS and

the two-stage procedure described above. The post-reform total wage elasticity is the sum of the coefficients attached to $\log(u_{rt})$ and to $\log(u_{rt}) \times D_{post}$. The formal *F*-test that the post-reform total wage elasticity is significantly different from zero is presented at the bottom of each panel.

We find a negative and significant relationship between both annual and monthly wages (columns 3-6) and the local unemployment rate after the wage reforms (even though the estimate is only marginally significant for monthly wages when using OLS). The elasticity varies from between -0.038 and -0.06 for monthly wages to between -0.084 and -0.106 for annual wages. The former compares well with the -0.029 reported by Devicienti et al. (2008) using weekly wages. The latter is in line with the traditional -0.1 found by Blanchflower and Oswald (1994) for many countries including Italy. However, we find no significant relationship between hourly wages[2] and the unemployment rate (columns 1-2).

If wage reforms have made it easier for wage-setters to adapt annual and monthly wages to local labour market conditions this must be linked to some extent to arrangements affecting the numbers of hours. The lower panel of Table 1 explores this idea and shows results from the estimates of a hours curve for the number of weekly hours, the number of annual months and the number of annual hours. A hours curve emerges for both annual months and annual hours, with an elasticity of about -0.04.[3]

These findings complement those of Devicienti et al. (2008) who find that top-up wage components are especially responsive to local conditions. Indeed, these components are linked to work hours both through overtime and (collective and individual) wage premia conditional on the achievement of sales and output targets.

6. Concluding Remarks

This paper finds that a wage curve exists in Italy, at least after the 1992-93 wage reforms, for annual and *monthly* wages but not for *hourly* wages. Consistently, after 1992-93 we find a negative elasticity of annual hours and months worked with respect to the unemployment rate.

Thus, it seems that the increased responsiveness of annual and monthly wages to local labour market conditions after the 1992-93 reforms is due to the emergence of a hours curve rather than to a proper wage curve.

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[2] Using hourly wages net of overtime does not change the results.

[3] We address the issue of the possible endogeneity of the unemployment rate conducting a *C*-type endogeneity test. This entails estimating an IV model on regionally aggregated data using lagged variables as instruments (Baltagi and Blien, 1998). We never reject the null hypothesis of exogeneity of u_{rt} both for the wage and the hours specification.

References

Ammermüller A., Lucifora C., Origo F., Zwick T. (2009), Wage Flexibility in Regional Labour Markets: Evidence from Italy and Germany, *Regional Studies*, August, 1-21.

Baltagi B.H., Blien U. (1998), The German wage curve: evidence from the IAB employment sample, *Economics Letters*, 61, 135–142.

Blanchflower D., Oswald A. (1994), *The Wage Curve*, MIT Press: Cambridge.

Bell B., Nickell S., Quintini G. (2002). Wage equations, wage curves and all that. *Labour Economics*, 9, 341–360.

Card D. (1995), The wage curve: a review. *Journal of Economic Literature*, 33, 785–799.

Casadio P. (2003), 'Wage formation in the Italian private sector after the 1992–93 income policy agreements', in G. Fagan, F.P. Mongelli and J. Morgan (eds), *Institutions and Wage Formation in the New Europe*, Cheltenham, UK: Edward Elgar, p. 112–33.

Destefanis S., Mastromatteo G., Verga G. (2005), Wages and monetary policy in Italy before and after the wage agreements, *Rivista Internazionale di Scienze Sociali*, 113, 289–318.

Devicienti F., Maida A., Pacelli L. (2008), The resurrection of the Italian wage curve, *Economics Letters*, 98, 335–341.

Nijkamp P., Poot, J. (2005), The last word on the wage curve? *Journal of Economic Surveys*, 19, 421–450.

Table 1: Unemployment elasticity of wages and hours

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A. Wages					
	Hourly wages		*Monthly wages*		*Annual wages*	
	OLS	Two-stage	OLS	Two-stage	OLS	Two-stage
$\log(u_{rt})$	0.037	0.017	0.032	0.008	0.019	-0.017
	(0.031)	(0.035)	(0.029)	(0.033)	(0.045)	(0.038)
$\log(u_{rt}) \times D_{post}$	-0.066	-0.049	-0.070	-0.068	-0.103	-0.089
	(0.021)***	(0.032)	(0.023)***	(0.029)**	(0.025)***	(0.033)**
N	34611	190	34724	190	34902	190
R^2	0.38	1.00	0.49	1.00	0.46	0.99
Post-reform elasticity: $Prob > F$	0.35	0.35	0.16	0.07	0.03	0.00
	Panel B. Hours					
	Weekly hours		*Annual months*		*Annual hours*	
	OLS	Two-stage	OLS	Two-stage	OLS	Two-stage
$\log(u_{rt})$	-0.000	0.005	-0.010	-0.020	-0.011	-0.012
	(0.015)	(0.020)	(0.019)	(0.020)	(0.024)	(0.022)
$\log(u_{rt}) \times D_{post}$	-0.006	-0.024	-0.030	-0.019	-0.034	-0.040
	(0.012)	(0.018)	(0.008)***	(0.013)	(0.015)**	(0.023)*
N	35390	190	35328	190	35211	190
R^2	0.38	0.98	0.10	1.00	0.28	1.00
Post-reform elasticity: $Prob > F$	0.73	0.37	0.04	0.04	0.08	0.05

Note: Robust standard errors in parentheses clustered by region in OLS regressions. * significant at 10%; ** significant at 5%; *** significant at 1%.