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Honours as a signal - evidence from a quasi-natural experiment in Italy

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Abstract

This note compares the wage premium of honours degrees in two different Italian university systems (old and new) in 2011 using data from the Italian National Institute of Statistics. The wage premium of a honours degree in the new system disappears due to honours inflation and hence the signal of potential higher productivity stopped working. In contrast, for graduates under the old system, the signal statistically significantly affects wages.

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1. Introduction

The Italian higher education system includes final degree grades from 60 to 110 as well as the honours degree *110 e lode* (*110L*). Using data from the Italian National Institute of Statistics (Istat), we can observe two different university systems ('new' and 'old') in the same year (2011) in Italy. The graduation scheme did not change nor was there a political recommendation to increase top grades in the new system. Yet, the award of honours degrees skyrocketed in the new compared to the old system. This honours inflation reduced the informativeness of honours grades in the inflated system (Chan et al. 2007).

In Italy, the honours degree is awarded only to outstanding students by unanimity of the graduation commission. The honours (*lode*) can be interpreted as a screening device or signal of high productivity to the labour market in the spirit of Arrow (1973) and Spence (1973). This note is based on the assumption that the honours itself is the signal. That is, there is no difference in acquired human capital between the maximal available grade of *110* and *110L* but the *lode* emphasizes higher innate ability or productivity. The honours degree is not randomly assigned and hence graduates with *110L* can credibly convey information of productivity or ability to the labour market. Given that employers have imperfect information on workers' productivity, they search for ways to distinguish more productive from less productive candidates before hiring them. The *lode* can be seen as such a signal of higher productivity.

There is a broad literature on education signalling (Fang 2006, Carneiro and Lee 2011, Clark and Martorell 2014, Freier et al. 2015, and Zheng 2017).[1] As long as there is an interest to preserve the value of the honours for outstanding students, grade inflation should not occur (Chan et al. 2007). Indeed, inflation of the *lode* signals a high percentage of very high-ability students and leads to a signal that is no longer credible. The assumption made in this note is in line with the results of Brown and Sessions (1999) and Castagnetti et al. (2005) for Italy who find support of the education signalling hypothesis. Brown and Sessions (1999) and Castagnetti et al. (2005) analyse effects of educational performance for self-employed workers in Italy. These studies do not consider the wage effects of the honours degree or exploit the quasi-natural experiment of the university system change. Another part of the literature considers differences in returns to education by type of university finding higher returns of attending selective, prestigious or elite private universities (Hoekstra 2009, Chevalier and Conlon 2003, and Brewer et al. 1999). Besides higher wage premium for graduates by type of university, the premium may differ also by subject (e.g. Belfield et al. 2018). This note accounts for differences by degree group by looking at the ceteris-paribus wage premium of honours degrees.

Since 1999, Italy is a full member of the Bologna process and has sought to implement a uniform European higher education area since then. In the course of this implementation, Italy started to change the university system. In the old system, the duration of the study programmes was between four to five years, while nowadays the system consists of a (generally) three-years bachelor and a two-years master degree. The qualification of a degree under the old system is comparable to a master degree under the new system and the grading policy did not change (i.e. grades $\in 60, \ldots 110, 110L$). Using data from Istat, we can observe graduates from the old and new university system in the same year.

Figure 1 shows the distribution of grades in Italy in 2011. The grades are clearly right tailed

[1] For a recent review of the literature on returns to education see Psacharopoulos and Patrinos (2018).

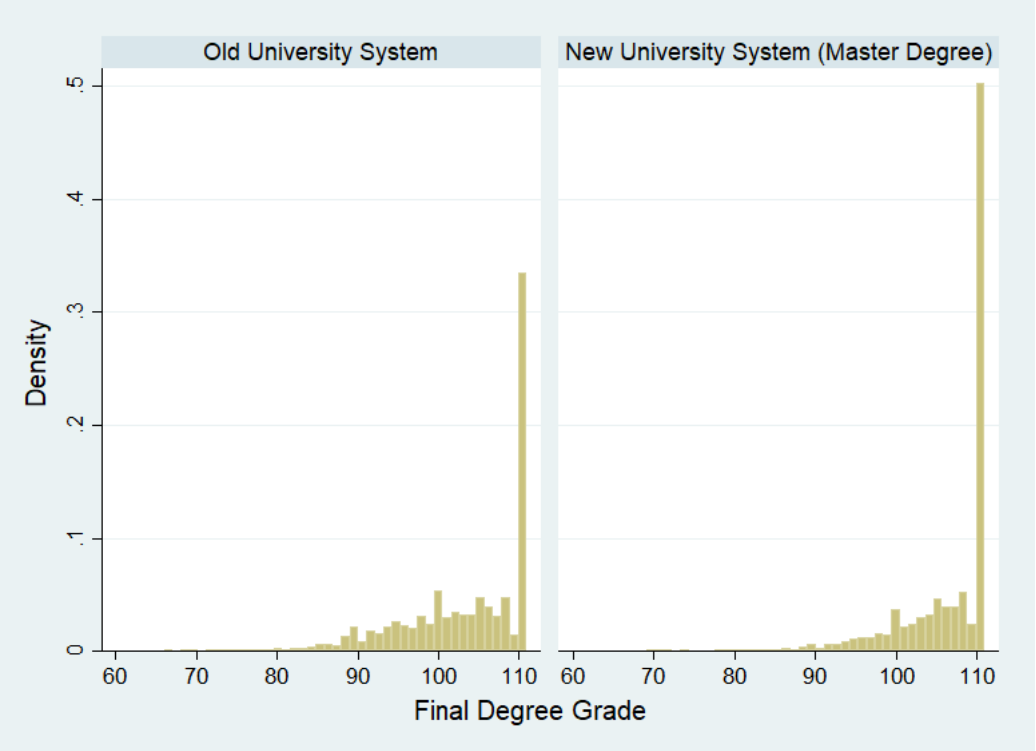

Figure 1: Histogram of Final Degree Grades by University System in 2011 in Italy. Own Calculations on Data from Istat.

with extreme frequencies of the top grade *110L*. This is especially pronounced for the new system. The inflation of top grades raises the question whether the *lode* can still be considered an economically meaningful and working signal of productivity. The European higher education system itself does not imply an increase in top grades and hence the quasi-natural experiment induced by the change in the university system allows for an interesting case study.

This note is organized as follows. Section 2 describes the data set used and the estimation strategy, while Section 3 presents the results. Finally, Section 4 concludes.

2. Data and Method

The data set is based on the ninth and latest available survey *Indagine campionaria sull' inserimento professionale dei laureati*. The survey was conducted in 2015 by the Italian National Institute of Statistics (Istat) and considers only university graduates from the year 2011. The universities are legally required to provide information on their graduates (*art. 7, Decreto Legislativo n. 322 06/09/89*). Individuals with degrees below *110* are not considered in the analysis. Further, I drop individuals with less than 400 Euro monthly net wage income.

Table 1, Panel A, shows that the raw gap is highly statistically significant and amounts to 5% (log approximation) in the old system. In the new system, the differential equals to -1% and is statistically insignificant. In total, we observe 6,463 individuals in the old and 16,326 in the new system. That is, the fraction of honours degrees increases from 24% in the old to

36% in the new system. Most of the Italian top-universities are located in the North.[2] Looking at the raw wage difference by aggregated university-region (North, Centre, South and Islands), we see no statistical significant difference in wages between graduates from universities located in the North (see Table 1, Panel B). In the Centre and South (including the Islands), there is a statistical significant gap in wages in the old system. Yet, in the new system, no significant differences in pay between graduates with *110L* and *110* are found. This suggests that the signal of the honours is successful in overcoming potential disadvantages in the labour market for graduates from less prestigious universities (located mainly in the Centre and South). Yet, given honours inflation in the new university system, the signal stopped working. In Northern Italy, the distribution of honours degrees over the university systems increases from 22% to 30%. In the Centre and South honours degrees are inflated relatively more: from 24% and 26% in the old to 41% and 44% in the new system, respectively.[3]

Table 1: Descriptive Statistics of Log Monthly Wages by University System and Honours Degree in 2011

System	Old				New			
	110		*110L*		*110*		*110L*	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Panel A: Descriptive Statistics and Raw Wage Difference by University System								
Log Net Monthly Wages ($\bar{y}$)	7.21	0.393	7.26	0.377	7.20	0.436	7.19	0.435
Difference ($\bar{y}^{110L} - \bar{y}^{110}$)		0.05***				-0.01		
Observations		713		1,550		2,699		5,888
Panel B: Raw Wage Difference by University-Region and University System								
North								
Difference ($\bar{y}^{110L} - \bar{y}^{110}$)		0.029				-0.012		
Observations		274		589		1,315		2,541
Centre								
Difference ($\bar{y}^{110L} - \bar{y}^{110}$)		0.095**				-0.028		
Observations		161		350		703		1,707
South and Islands								
Difference ($\bar{y}^{110L} - \bar{y}^{110}$)		0.052**				0.010		
Observations		278		611		681		1,640

The difference was tested with a two-tailed t-test. $***p < 0.01$, $**p < 0.05$.

The empirical strategy relies on a standard OLS regression that is augmented in the full model by a set of Fixed Effects (FEs) as well as a set of individual characteristics. The FEs are the following: region of the university, region of residence (or residence abroad) and degree group. This allows to obtain the effect of the signal on wages holding the degree group, the region of study and residence (as well as individual characteristics) fix. The dependent variable

[2] See Trovati (2016) for a classification of Italian universities.

[3] In the old (new) system, we observe 2,674 (8,442) individuals in the North, 1,446 (4,170) in the Centre and 2,343 (3,714) in the South.

is the log of net monthly wages. The treatment dummy s_i is equal to one if the individual obtained *110L* as final grade and zero if the individual graduated with *110*. The base model considers the effect of being treated or not as well as the set of individual characteristics x_i and thus (the coefficient of s_i) gives the adjusted pay gap. Augmenting the model with the three FEs represents the full model for individual i with $i = 1, \ldots, N$:

$$y_{ijgr} = s_i\gamma + x_i\beta + \phi_j + \zeta_g + \theta_r + u_{ijgr} \tag{1}$$

where ϕ_j, ζ_g and θ_r are the university-region, region of residence and programme group FEs, respectively. We thus observe $j = 1, \ldots, J$ universities located in J regions, $g = 1, \ldots, G$ regions of residence (including residence abroad) and $r = 1, \ldots, R$ degree groups.

Beyond looking at the adjusted wage effects of the honours for the full sample, i.e. graduates having obtained at least *110*, I repeat the analysis for men and women separately in order to get rid-off any potential discriminatory effects based on gender. Following the literature on heterogeneous returns by type of university, I look separately at the (conditional) wage gap by universities located in the North, Centre and South.

3. Estimation Results

Table 2 shows for the full sample only in the old system a statistically significant wage premium of the *lode*. Graduates from the old system signalling higher productivity to the labour market obtain on average 5.7% higher wages than graduates without the signal (Panel A). Adding FEs, increases the premium slightly to 5.9% (Panel B). For master graduates the results suggest no statistical significant effect on wages in both models. Looking separately at men and women shows again that the wage gap is only statistically significant in the old system and is most pronounced for women. The treatment effect in the base model is not statistically significant for men. Adjusting the effect for FEs both men and women enjoy a positive and significant wage premium from the honours. Table 2, Panel C, shows that for graduates of universities located in the North of Italy, there is no statistical significant wage premium in both systems. In contrast, for graduates of universities in the Centre and South, an honours degree gives a positive wage return in the old system. Moreover, in the case of Southern universities male graduates with *110L* do not receive a wage premium from the honours. Under the new system, the signal does not provide a positive wage return throughout Italy. This holds for both men and women.

All in all, the signal works better for women than for men. Indeed, women with an honours degree may signal special commitment to career proceedings. The *lode* may counteract wage penalties based on statistical discrimination from the employer-side towards women (due to higher potential labour-market interruptions because of motherhood). Yet, under the new system, the signal seems not to work, neither for men nor for women (at least in terms of wages).

4. Conclusion

This note studies the wage effect of honours degrees in the old and new university system in Italy. The results suggest that under the new system, the *lode* is inflated and thus no longer considered a credible signal by the labour market. In contrast, under the former university

Table 2: Adjusted Pay Gap in 2011

System	Old			New		
	Full Sample	Women	Men	Full Sample	Women	Men
Panel A: Adjusted Pay Gap						
Dummy *110L*	0.057***	0.066***	0.032	-0.014	-0.010	-0.019
	(0.017)	(0.021)	(0.029)	(0.009)	(0.013)	(0.015)
Observations	2,263	1,491	772	8,587	4,856	3,731
Panel B: Adjusted Pay Gap with FEs						
Dummy *110L*	0.059***	0.059***	0.048*	-0.014	-0.004	-0.020
	(0.016)	(0.020)	(0.028)	(0.010)	(0.012)	(0.013)
Observations	2,263	1,491	772	8,587	4,856	3,731
Panel C: Adjusted Pay Gap with FEs by University-Region						
North						
Dummy *110L*	0.041	0.046	0.032	-0.012	-0.014	-0.0004
	(0.027)	(0.033)	(0.045)	(0.012)	(0.016)	(0.020)
Observations	863	583	280	3,856	2,255	1,601
Centre						
Dummy *110L*	0.093**	0.079*	0.164**	-0.026	-0.004	-0.050*
	(0.037)	(0.047)	(0.064)	(0.017)	(0.023)	(0.026)
Observations	511	324	187	2,410	1,334	1,076
South and Islands						
Dummy *110L*	0.055**	0.073***	0.016	0.005	0.011	-0.017
	(0.024)	(0.028)	(0.042)	(0.017)	(0.025)	(0.025)
Observations	889	584	305	2,321	1,267	1,054

The set of covariates includes cohort effects, dummies for type of prior work experience (internship, limited contract) and Italian citizenship, study duration (in years) as well as region of residence, region-university and subject group fixed effects.
In Panel C, the set of covariates contains no region-university fixed effects.
Robust standard errors clustered at the individual level in parentheses. $***p < 0.01, **p < 0.05, *p < 0.1$.

system the signal worked and led to 5-18% higher wages. The signal works better for women than for men. Indeed, women with an honours degree signal special commitment to work and hence employers as well as customers may not or only partly price in the higher likelihood of career interruptions due to child-rearing and -bearing compared to men. Further, in particular honours inflation in universities located in the Centre and South took away credibility of the signal. Their graduates thereby lost a working channel for communicating special ability and commitment to the labour market.

A shortcoming of the study is that it is based on cross-sectional data only. However, the data set used allows for a detailed distinction of the different types of studies and contains information on the field and place of study. Further, it allows to observe the exact grade of the final degree. Even though this study does not explicitly account for the employer side but can just observe the labour-market outcome after an individual has been hired, we can catch the ceteris-paribus wage effects of the honours, i.e. the *lode*. Indeed, differences in wages on the basis of honours or not - other things equal – imply that the labour market rewards the honours degree compared to the (only) marginally lower final degree grade *110* and hence that the signal works. However, the results suggest statistical significant and positive effects of the signal only in the old system.

This study has shown that the signal of an honours degree in Italy has ceased to exist under the new system. The problem is not the implementation of the European higher education system but rather the massive award of honours degrees in Italy that inflated the signal. A hump-shaped distribution of grades, instead of the extreme right-tailed distribution, may bring back the effectiveness of the Italian honours degree.

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