

Employers' higher education and fixed term contracts:

Individual vs spillover effects

ISFOL

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• **Aims, Hypothesis and Background discussion**

- This paper tries to integrate some hints and suggestions stemming from the literature on **entrepreneurship** , **management practices** and **education** on the current debate on the determinants of firms' use of flexible staff arrangements
- We see at least 3 channels through which an high level of employers education may influence significantly firms incentives to use fixed term contracts
- **First:** Higher education favours a direct and indirect knowledge of these **modern management practices** that point out the competitive advantages deriving from on-the-job training, workers active involvement in productive process and flat hierarchies inside the firms (Bloon and Van Reenen, 2009; Raghuram and Wulf, 2006)
- **Second:** Attending schooling is associated to a range of cognitive skills and capabilities that enhances **time patience** and **long-terminism** in economic decisions by individuals (Oreopolous and Salvanes, 2011; Perez-Arce, 2012).
- **Third:** Attending schooling is correlated with a balance set of cognitive and no-cognitive skills that favour individual attitudes toward **cooperation, fairness and proto-social behaviour**. These behavioural traits, in turn, are recognized as important mechanism devices to enhance workers efforts, trust and long term employment relationships, even in presence of incomplete labour contracts (Bandiera, Barankay and Rasul,2005; Fehr, Goette and Zehnder,2008).

A Role for Employers ' educational spillovers

Based on this bulk of suggestions, we also can consider how the agglomeration of highly educated employers may exert an external effect on the choices of the firms located in the same economic environment concerning the use of temporary contracts.

The logo for ISFOL, consisting of a stylized white 'S' shape on the left and the letters 'ISFOL' in blue on the right.

ISFOL

In line with the literature pointing out the relevance of **knowledge spillovers arising in local areas from agglomeration of educated people** (Duranton and Puga, 2003; Rosenthal and Strange, 2004), we ask whether the entrepreneurial choices on the use of fixed term contract can be influenced by experiences and strategies of other employers in the same area.

In the existing literature firms resort to temporary contracts as the outcome of an optimal choice following profit maximization in a given institutional/legislative framework. In our framework also **socially-built preferences and strategic options of the employers matter**, as the choice of temporary contracts may be influenced by the interactions among employers. Indeed, both knowledge and attitudes are partially shaped by social interactions.

To this regard, the most natural and relevant channel of spillover is given by contacts and exchanges among employers and the **learning** descending from such interactions. Both formal and informal contacts and relationships may give rise to an exchange of information and opinions as well as can allow peer imitation (Audretsch and Keilbach, 2007)

As for small and medium enterprises, informal networks connecting employers in local areas can be regarded as a primary source of knowledge, a 'place' where a common view can grow up and diffuse. A special role in the local networks connecting entrepreneurs is played by the consultants offering services and advices to small and medium enterprises. Then, **consultants and business associations can be regarded as a major channel of knowledge spillover in the local economies.**

A further insight into the mechanism channeling this educational spillover can be drawn from the idea of '**inefficient herding**' (Banerjee, 1992; Duranton and Puga, 2003). According to it, under uncertain demand conditions each agent bases his/her decisions upon decisions made previously by other agents in the same environment. Then, if this process of sequential choices is started by less than optimal decisions, also later choices made by other agents are likely to be inefficient. Indeed, previous choices convey a wrong signal distorting the subsequent ones. Such self-reinforcing mechanism may give rise to a suboptimal outcome. This can help to explain the exorbitant resort to fixed-term contracts even when their detrimental effect on productivity outweighs the short-term cost gains

Finally, beside the knowledge spillover, also a '**pecuniary**' spillover might be in action in environments where a large number of highly educated employers are located, as the higher incidence of permanent jobs created by such employers may crowd-out temporary jobs. Assuming that, *ceteris paribus*, workers prefer a permanent job to a temporary one, in an economy where they are more likely to get a permanent job they are able to claim a higher wage if offered a temporary job as it is less costly for them to refuse it. As a consequence, fixed-term employment becomes less profitable for local employers and the share of fixed-term employment lowers

Data



- The empirical analysis is based on **Employer and Employee Survey (RIL)**, conducted by ISFOL in 2010 on a representative sample of over 25000 partnership and limited firms operating in the non-agricultural private sector
- **Sample selection:** firms with at least 5 employees to guarantee a minimum level of organization of the internal labor markets. Further, the sample is restricted to these firms with no missing data on the key variables. Then the final sample over 10000 firms
- **Other data source:** Census 2001; Labor Force Survey (Istat)

Main Descriptive Statistics



. On average, the **total share of workers with fixed term contracts** is about 14% of the total employment; the share of workers with **fixed term contracts without training clause** is 9.4% while those with **fixed term contracts with on-the job training clause** is 4.4%.

- On average, only 23% of firms are managed by an **employer with a tertiary level education**. Similarly, our sample presents a small incidence of firm with employers younger than 40 years (12%) with respect to those managed by employers aged between 40 and 59 years (61%) those with employers older than 60 years (27%) with those with employers older than 60 years (27%).

- The individual profile of the Italian employers is associated with the predominant presence of firms **small in size** (76%) and **family-owned** (90%), which typically require less formal education and skills to be managed than firms large in size and market-owned (Leazar, 2009)



Table 1: Descriptive statistics with sampling weights

	Mean	Std dev	Min	Max
Fixed term workers				
% total fixed term (FT)	0.14	0.22	0	1
% fixed term with training (FTT)	0.044	0.10	0	1
% fixed term without training (FTNT)	0.094	0.20	0	1
Employers characteristics				
tertiary education	0.23	0.42	0	1
entrep. age <40	0.12	0.32	0	1
39<entrep age <60	0.61	0.49	0	1
entrep. age >59	0.27	0.44	0	1
Workers characteristics				
% tertiary education college	0.08	0.17	0	1
% upper secondary education	0.44	0.30	0	1
% lower secondary education	0.47	0.34	0	1
% female	0.37	0.29	0	1
% trained	0.20	0.33	0	1
Firms characteristics				
family firm	0.90	0.30	0	1
gest_man	0.03	0.18	0	1
gest_man_int	0.07	0.26	0	1
gest_pr	0.90	0.30	0	1
product innov	0.39	0.49	0	1
process innov	0.31	0.46	0	1
local bargaining	0.06	0.24	0	1
foreign market	0.23	0.42	0	1
ln (ros)	11.66	1.21	3.14	19.50
unemployemtn rate 2009 at prov	0.07	0.03	0.02	0.19
N of obs	11026			



Table 1a: Descriptive statistics with sampling weights

	Mean	Std dev	Min	Max
Size				
5 <n. employees <15	0.76	0.43	0	1
14 <n. employees <50	0.19	0.39	0	1
49 < n. employees <250	0.04	0.20	0	1
n. employees > 249	0.01	0.08	0	1
macro regions				
North Ovest	0.31	0.46	0	1
North East	0.26	0.44	0	1
Centre	0.21	0.41	0	1
South	0.22	0.41	0	1
Sector				
Quarrying, Mining etc	0.00	0.05	0	1
manufacturing	0.29	0.45	0	1
gas, water and gas distribution	0.01	0.10	0	1
Construction	0.14	0.34	0	1
retail and wholesale	0.22	0.42	0	1
trasportation	0.03	0.18	0	1
hotels and restaurants	0.11	0.31	0	1
insurance, financial intermediation	0.01	0.12	0	1
real estate and rental	0.05	0.21	0	1
information, comunication and other business service	0.09	0.28	0	1
health, education and social services	0.02	0.15	0	1
sports, entertainment and other services	0.03	0.17	0	1
N of obs	11026			

Econometric analysis: step 1



The proportion of fixed term contracts (%FT) is estimated as a function of variables measuring individual profile of employers and a set of firm levels controls using RIL Survey:

$$(1) \quad \%FT_i = \alpha \cdot employer_educ + \beta \cdot X_i + \delta \cdot Y_i + \varepsilon_i$$

- Different specification of equation (1) are estimated by using a linear (**OLS and 2SLS-IV**) regression model that makes it easier the interpretation of the coefficient estimates (Angrist and Pischke, 2009)

- **OLS estimates are displayed in Table 2; 2SLS-IV estimates are shown in Table 3**

Table 2: OLS estimates: total share of FT

	Model 1		Model 2		Model 3	
	coeff	std er	coeff	std er	coeff	std er
Employer characteristics						
employer tertiary educ	-0.021 ***	0.003	-0.012 ***	0.004	-0.019 ***	0.004
employer age =Young	0.046 ***	0.006	0.043 ***	0.006	0.043 ***	0.007
entrep age = middle	0.022 ***	0.003	0.022 ***	0.003	0.021 ***	0.003
Workforce characteristics						
% tertiary education					0.078 ***	0.012
% upper secondary education					0.006	0.007
% female					0.035 ***	0.008
% trained					-0.019 ***	0.004
unemployment rate 2009					0.036	0.093
Firm characteristics						
fam_firm			0.012 ***	0.004	0.015 ***	0.004
foreign market			-0.008 **	0.003	-0.013 ***	0.004
product innov			0.008 **	0.004	0.011 ***	0.004
process innov			-0.001	0.004	-0.004	0.004
local bargaining			-0.033 ***	0.004	-0.029 ***	0.004
ln (ros)			-0.013 ***	0.001	-0.013 ***	0.001
Macro-region	Yes		Yes		Yes	
Size classes	Yes		Yes		Yes	
sector dummies	Yes		Yes		Yes	
constant	0.049 ***	0.007	0.191 ***	0.018	0.190 ***	0.023
F(.)	51.17		45.85		31.650	
Prob > F	0.00		0.00		0.000	
R-squared	0.14		0.15		0.146	
N of obs	14298		13663		11016	

Source: RIL-ISFOL data. Note: omitted variable, employer with lower education and with age more than 60; south, <4 n. of employees<15; Statistical significance *** at 1%, ** at 5%, * at 10%

Table 3: 2SLS Instrumental variable regression; var dip: total share of FT

	Model 1		Model 2		Model 3		First Step	
	coef	std er	coef	std er	coef	std er	coef	std er
Employer characteristics								
employer tertiary educ	-0.109 ***	0.017	-0.089 ***	0.024	-0.108 ***	0.031		
employer age =Young	0.056 ***	0.007	0.052 ***	0.007	0.052 ***	0.008	0.105 ***	0.015
entrep age = middle	0.028 ***	0.003	0.026 ***	0.003	0.025 ***	0.004	0.050 ***	0.009
Workforce characteristics								
% tertiary education					0.124 ***	0.021	0.483 ***	0.028
% upper secondary education					0.015 *	0.008	0.113 ***	0.014
% female					0.038 ***	0.008	0.037 **	0.017
% trained					-0.019 ***	0.004	0.005	0.011
unemployment rate 2009					0.105	0.098	0.803 ***	0.211
Firm characteristics								
family firm			-0.002	0.006	0.002	0.006	-0.103 ***	0.013
foreign market			-0.003	0.004	-0.008 **	0.004	0.048 ***	0.010
product innov			0.010 **	0.004	0.011 ***	0.004	-0.001	0.010
process innov			-0.001	0.004	-0.002	0.004	0.020 **	0.010
local bargaining			-0.023 ***	0.005	-0.018 ***	0.006	0.109 ***	0.014
ln (ros)			-0.011 ***	0.001	-0.012 ***	0.002	0.022 ***	0.004
Macro-region	Yes		Yes		Yes		Yes	
Size classes								
sector dummies	Yes		Yes		Yes		Yes	
management external recruitment share of population with tertiary education in 2001							0.134 ***	0.019
							3.129 ***	0.358
constant	0.061 ***	0.008	0.177 ***	0.022	0.179 ***	0.024	-0.292 ***	0.060
Centered R2	0.102		0.125		0.108		0.27	
Uncentered R2	0.353		0.370		0.352		0.51	
Number of obs	14105		13493		10926		10926	

Source: RIL-ISFOL data. Note: omitted variable, employer with lower education and with age more than 60; south, <4 n. of employees<15; Statistical significance *** at 1%, ** at 5%, * at 10%

Econometric analysis: step 2

The proportion of fixed term contracts (%FT) is estimated as a function of variables measuring individual profile of employers, the agglomeration of entrepreneurial human capital and a set of firm levels controls:

$$(2) \quad \%FT_i = \alpha \cdot educ_grad_i + \beta \cdot D_c + \delta \cdot W_i + \chi \cdot F_i + \varepsilon_i$$

educ_grad is a dummy variable indicating whether the employer is graduated, while D_c is a density indicator, specifically it is the number of employers with a tertiary level of education in the province *p* and sector *c* in which firm *i* is located (this is an indicator of **entrepreneurial human capital spillovers**).

We estimate equation (2) with linear regression models: OLS and 2SLS_IV estimates are displayed in Table 4

IV estimation results: caveats

Our data can be affected by a selection bias due to the fact that the sampling was carried out in a year of deep economic crisis (2010).

In principle, during a crisis period the incidence of temporary jobs on total employment can either increase or decrease in the whole economy, and this trend could potentially affect all the firms included in the sample.

This type of bias should amplify the effect of the covariates towards a greater/lower use of temporary jobs with respect to a pre-crisis period. In particular the empirical evidence shows that the **share of temporary jobs has increased during the crisis and, in particular, over the 4 quarters of 2010.**

Then, the estimated coefficient our main variable (D_c), is expected to be **upward biased**, due to cross sectional sampling. Nevertheless, as we will discuss soon, D_c has a significantly negative impact on the share of temporary employees on total firm's employment.

Therefore, **the "true" value of the coefficient, adjusted for the recession effect, should be even more negative.** This way we can clearly identify the effect of local employers' aggregate human capital, even if we are not able to model directly the bias.



IV estimation Results: futher

The main variables of equation (2), ***Dc*** and ***employer_educ***, are instrumented and tests for weak instrumentation perform well demonstrating that instruments are not weak.

Then Table 4 shows that ***Dc*** is **negative and highly significant** demonstrating that an agglomeration of high educated employers affects the firms' individual decision to hire on temporary basis.

This result is independent from the skill of the employer: therefore it can be argued that an agglomeration of high skill employers creates a spillover effect that on average affects the totality of the employers.

The fact that the employer's individual skill is not significant while agglomeration of high skill creates a spillover is a really interesting and complex result that should be analyzed more deeply

At a first glance such result seems to recall an **herding effect** and we can argue that such effect it is made through **informational cascade** which occurs when people observe the actions of others and then make the same choice that the others have made, independently of their own private information signals.

Table 4: OLS and 2SLS-IV estimates

	OLS		2SLS-IV		st er
	coef		coef		
Employer characteristics					
Dc	-0.072 ***	0.024	-0.381 ***		0.108
employer tertiary educ	-0.012 **	0.006	0.007		0.009
employer age = Young	0.038 ***	0.010	0.037 ***		0.010
entrep age = middle	0.019 ***	0.005	0.017 ***		0.005
Workforce characteristics					
% tertiary education	0.066 ***	0.019	0.053 ***		0.020
% upper secondary education	-0.005	0.012	-0.005		0.012
% female	0.042 ***	0.012	0.043 ***		0.012
% trained	-0.026 ***	0.006	-0.024 ***		0.007
% hired in 2009	0.001 ***	0.000	0.001 ***		0.000
Firm characteristics					
family firm	0.012 **	0.006	0.009		0.006
firm age	0.000 ***	0.000	0.000 ***		0.000
foreign market	-0.011 *	0.006	-0.008		0.006
ln (ros)	-0.019 ***	0.002	-0.018 ***		0.002
product innov	0.013 **	0.005	0.012 **		0.005
process innov	-0.012 **	0.006	-0.012 **		0.006
local bargaining	-0.032 ***	0.006	-0.030 ***		0.006
unempl rate 2009	0.133	0.155	0.320 *		0.166
industrial district	-0.030 ***	0.006	-0.041 ***		0.008
Macro-region	Yes		Yes		
Size classes	Yes		Yes		
sector dummies	Yes		Yes		
managment external recruitment			Yes		
share of population with tertiary education in 2001 (prov)			Yes		