

# Fixed term contracts and employers' human capital: the role of educational spillovers\*

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*(Preliminary version)*

## Abstract

This paper analyzes the role of the agglomeration of highly educated employers on firms' utilization of fixed term contracts, an issue that the literature has not investigated so far. Taking advantage of a unique firm-level dataset provided by ISFOL for 2010, our findings demonstrate that the "proximity" of graduate employers reduce significantly the firms' propensity to hire on a temporary basis. Then, we argue that knowledge spillover deriving from the human capital of employers represents a potential channel through which reducing the insider-outsider divide of labor market. Moreover, a number of econometric issues are considered to verify such a result: the skewed and bounded nature of the share of fixed term contracts, the endogeneity issues derived from the agglomeration effect as well as the cross section dependence problems affecting standard errors.

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## 1. Introduction

A number of recent studies show a negative relation between the use of temporary work arrangements and the evolution of productivity in European countries since the mid '90s (Damiani, Pompei and Ricci, 2012; Boeri and Garibaldi, 2011; Michie and Sheenen, 2003; etc) .

This evidence support the view that the diffusion of flexible staff arrangements has fostered “low-road” practices to human resource management in labour market mainly in those countries that have removed any legal and economic constraints to hire on temporary basis. In particular, the use of fixed term contracts hurts on-the-job training investments and cooperative relationships at workplace, leading to a significant slowdown in productivity growth and inefficient organization of internal labour markets (Belot, Boone and van Ours, 2007; (Kleinknech et al., 2006; 1999).

There are different reasons that may be argued to rationalize such a “myopic” behaviour of firms. Since hiring permanent workers implies an irreversible cost due to firing costs, when demand uncertainty increases firms may find it convenient to postpone decisions to hire workers permanently as a sort of real option (Lotti and Viviano, 2011). As well, limited information about ability of workers and /or industrial relation reasons may favour firms’ propensity to use fixed term contracts as a screening device or to dualize its internal labour market, without considering productivity and efficiency losses due to the forgone skill accumulation of temporary workers (Burgess, ecc, 2003; Blanchard and Landier, 2002)

The economic uncertainty, institutions, incomplete contracts and other labour market imperfections are useful to shed light on firms’ incentives to use temporary workers. However other important factors should be considered. Among these the individual profile of the employers.

In particular, we believe that the education of employers may play a key role on explaining the “perverse effect” of fixed term contract on economic growth. On the other hand, the human capital of employers is recognized as a key factor behind the firms’ personnel policies and, then, their use of flexible staff arrangements (Lazear, 2009; Van der Sulis, van Praag, Vijverberg 2008).

For example, a high level of education is expected to translate into modern management practices that point out the competitive advantages deriving from training, firm-specific skill accumulation and technological adoptions that, themselves, tend to favour long-term employment relationships at workplace (Bloon and Van Reenen, 2009).

Further, a high level of education is expected to increase cognitive flexibility about economic uncertainty and then it helps to neutralize the effect of “hyperbolic preferences” of employers that lead to “overweight” the short-run gains of temporary contracts and “underweight” their long run cost in term of forgone innovation, skill and productivity (Perez-Arce, 2012; Oreopolous and Salvanes, 2010).

Still, education is expected to favour attitudes toward cooperative behaviour, trust and fairness at workplace. These behavioural features potentially represent a sort of enforcement mechanism designs that reduce the employers’ incentive to hire on a temporary basis because of incomplete information about workers’ efforts and productive ability (Fehr and Gächter, 2000; Fehr, Goette and Zehnder, 2008; Bandiera, Barankay, and Rasul, 2005).

Based on this bulk of suggestions and evidence, and in line with the literature pointing out the possible knowledge spillovers arising from agglomeration of educated people, we consider also how the agglomeration of highly educated employers may exert an external effect on the choices of other employers located in the same area concerning the use of temporary contracts. More precisely, we test whether where the share of employers holding a university degree is larger, the incidence of temporary employment tends to be lower. Thus we try to shed light on a possibly relevant but quite neglected externality of education originating from entrepreneurs.

At present, only scattered empirical evidence, in any, is available to support such hypotheses.

The present paper aims to fill this gap in the literature by using a unique dataset that collects information on a representative sample of Italian firms operating in both manufacturing and service sector. The data is drawn from the *Employer and Employee Surveys* (RIL) conducted in 2010 by ISFOL on limited and partnership firms.

The empirical analysis shows that previous hypothesis holds true: the presence of a higher educated employer reduces significantly the total share of fixed term workers, taking into account also a rich set of information about workplace practices, firms' characteristics and employment composition. Furthermore, we find that the agglomeration of highly educated employers begets a local spillover effect which significantly reduces the incidence of fixed term jobs in the same area. This result is robust to different econometrics concerns: the skewed and bounded nature of the share of fixed term workers and endogeneity issues.

To our knowledge this is the first time that the relationship between the use of fixed term contracts and entrepreneurs' education is investigated using micro-data on firms. Further we contribute to the literature by shedding light on some important features of personnel policies in small Italian firms, an issue not yet accounted by the literature on this field.

The paper is organized as follows. In section 2 we discuss the related literature and hypotheses. Section 3 presents the data and descriptive statistics. Section 4 provides the econometric specification to test our hypothesis and the results while section 5 concludes.

## **2. Background discussion and hypothesis**

As stated above, this paper aims at analysing the effect of the education of the employers in the diffusion of fixed-term employment. To this end we build on the results of various strands of literature suggesting possible links between the employer's education and the use of temporary contracts. After considering the reasons why a more educated employer is less likely to recruit his/her workforce on a temporary basis, we take a step forward arguing that the agglomeration of

better educated employers might beget spillover effects influencing the choice of offering permanent or temporary job contracts by the employers in the same area.

Accordingly, in this section we first sum up insights and results from the received literature pointing out a few reasons why a highly educated employer is expected to be less prone to resort to fixed-term employment (for a deeper review of this literature see Ricci, 2013). Second, we provide possible motivations for the existence of an external effect of the employers' education affecting the choices of other employers apart from their own educational level. More precisely, we hypothesise that in economic environments where a large share of university graduated employers operate, both cognitive and non-cognitive effects of the tertiary education may spread curbing the resort to temporary employment by other employers. As argued below, educational spill-overs may rest on direct contacts among employers in a local economy as well as on more indirect interactions through the network of consultants and business associations. The share of highly educated employers may also have an influence mitigating 'inefficient herding' arising when decisions made by some agents may convey the wrong signal distorting the choices of their peers in the same environment.

As mentioned before, the vast amount of research devoted to analyse the diffusion of fixed term contracts has paid little attention on the human capital profile of employers. Such poor regard for this issue is quite surprising as the individual characteristics of the employers have been proved to be an important factor underlying the overall firm performance. This is consistent with human capital theory predicting that education investment leads to benefits for the individual. Such benefits, in case of an entrepreneur, do not consist only in income but also in a higher firm survival rate, innovation and the adoption of efficient management practices (Boumol, 1990; Van der Sluis and van Praag ,2008; Lazear, 2009; Bloom and Van Reenen, 2009).

According to Lazear (2002) employers should possess a "balanced" human capital endowment and skills in a vast range of fields to operate successfully in complex and dynamic economic

organizations. Accordingly, entrepreneurship requires general knowledge and attending schooling is expected to provide prospective employers with it.

The individual attributes and education of the employer are even more important for explaining his/her personnel policies and management decisions in small business and family owned firms.

This view is consistent with the “upper echelon” theory which considers an economic organization as a reflection of its employer (Bates, 1990; Lussier, 2001). It links observable characteristics such as employer’s age, formal education, financial position and management heterogeneity to organizational outcomes and performance. For example, the employer’s education has proven to be a significant predictor of the growth and profitability, as higher education is expected to be associated with more knowledge capabilities and skills (Roper, 1999). The predictive power of this theory on entrepreneurship for personnel policies (and the use of fixed term contracts) is substantial. In small businesses the capabilities and skills associated with the education of the employer represent key factors to favor a “high road” to human resource management, mainly in the midst of intense technological and economic change.

Employers with high educational level are expected to be aware of the value of workers involvement and cooperative behaviour inside the firms in order to pursue competitive business strategies. At the same time they are more likely to recognize that an intensive use of temporary contracts discourages such involvement and cooperative attitudes.

Further arguments may be derived from the literature on management practices. Bloom, Genakos, Sadun and van Reenen (2011) find evidence that the education of managers (and workers) is strongly correlated with high management scores across countries and sectors. Well-managed firms, in turn, tend to have better policies for workforce along several dimensions, as job flexibility and self-assessed employee satisfaction (Bloom, Kretschmer and van Reenen, 2011; Bloom and Van Reenen, 2009). These insights then give a further support to the hypothesis that the education of the employer is correlated with the adoption of management practices and

organizational arrangements that reduce the utilization of temporary contracts, as working under fixed term contracts may discourage job satisfaction, productive efforts and workers' initiative at workplace (Belot, Boone and van Ours, 2007).

Moreover, research on education shows that attending school provides cognitive and non-cognitive skills, affects markedly time preferences, social norms and fairness by individuals (Heckman and Cunha, 2010; Meghir 2012). In case of an employer, these cognitive and non-cognitive skills are expected to weaken the incentives to hire on a temporary basis. In particular, several papers show that schooling has an impact on patience and time preferences making educated people more prone to reduce the remoteness of future pleasures (Perez-Arce, 2012; Becker and Mulligan, 1997; Oreopolous and Salvanes, 2010).

It follows that a high level of schooling of the employer is expected to favor time consistent decisions about the use of temporary contracts. Long-sighted workforce policies should properly consider not only the short-run cost advantages deriving from the use of temporary contracts but also their long-lasting detrimental effect on productivity. Hyperbolic discounting may explain the excess use of fixed term contracts as "buffer stocks" because impatient employers are likely to react excessively to the uncertainty of the economic environment and/or to be characterized by higher risk-aversion in human capital investment (Lotti and Viviano, 2011; Bentolila and Bertola, 1990; Saint Paul, 2002).

Furthermore, schooling enhances attitude toward trust and cooperative behaviour, learning and reciprocity by individuals facing complex environments (Bowles and Gintis, 2008). Then, in our context one may argue that a high educated employer is more likely to use cooperation and partial gift exchange strategy to motivate unobservable efforts, rather than using fixed term contracts as a discipline device to avoid shirking.

Based on this bulk of suggestions and evidence, we can now 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. 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. More precisely, we hypothesize that where the share of employers holding a university degree is larger, the incidence of temporary employment tends to be lower. Thus we shed light on a possibly relevant but quite neglected externality of education originating from entrepreneurs. The examination of this issue may enrich also the economic analysis concerning the alternative between temporary and permanent employment faced by entrepreneurs.

Indeed, 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. Thus, apart from the primary role of incentives and constraints dictated by nationwide labour institutions, the choice between fixed-term and permanent contracts can be regarded as a discretionary choice whose outcome is affected on a local scale also by knowledge and attitudes of the decision-makers.

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 (Acs et al., 2009; 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. Faced with a complex and uncertain environment, most employers resort to business and employment consultants and

locally based business associations in order to achieve information and guidance. Such professionals possess a broad knowledge in their field, encompassing codified as well as tacit components. Indeed, apart from codified knowledge referring to laws and business principles which are homogeneous on a national scale, they develop a localized knowledge through the accumulation and comparison of information arising from a vast number of experiences concerning their clients. As an outcome of this ongoing process they can form an opinion and select suitable solutions. In the interplay with entrepreneurs, on the one hand, they have to take into account their preferences and motivations as well as the technological and market specificities of their business while, on the other hand, they circulate information and spread solutions shaping the entrepreneurial attitudes and choices of their clients.

Then, consultants and business associations can be regarded as a major channel of knowledge spillover in the local economies. In areas where a large number of better educated employers are located, their preferences to human resources management as well as their practices reach the consultants and contribute to shape their opinions. These, in turn, are diffused to the overall business community affecting the rest of local entrepreneurs whatever their educational level. Then, according to the suggestions from the literature cited above, it can be argued that in such places a lower propensity toward fixed-term employment is likely to spread. As a consequence, a relatively lower incidence of temporary jobs will be observed compared to other places with a lower share of highly educated employers. To sum up our argument, through direct relationships as well as through the network of the business consultants and associations, university graduated employers can generate a spillover effect whose strength increases with their share in the total number of employers in a specific sectoral/local environment.

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. However, the inefficient outcome can be mitigated and even reversed if agents with better information lead the process. Accordingly, we may argue that where the share of highly educated employers is large enough the process is more likely to be directed by better decisions and a lower incidence of temporary employment could prevail.

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. Even in this case, the mechanism stems from the presence of a large number of better educated employers.

### **3. Data**

The empirical analysis is based on *Employer and Employee Surveys* (RIL) conducted by ISFOL in 2010 on a nationally representative sample of partnership and limited companies operating in the non-agricultural private sector. Our sample consists of 24,459 firms distributed on 110 Italian Provinces. For empirical purpose, we exclude firms with less than five employees to retain only those firms characterized by a minimum level of organizational structure.

The RIL survey collects a rich set of information about personnel organization, industrial relations and other workplace characteristics. In particular, it allows to detect the educational level and other demographic characteristics of entrepreneurs along with the intensity of use of fixed

term contractual arrangements and other information about firms personnel policy, industrial relation and productive specialization (see Appendix for detailed definitions of all variables from RIL).

### **3.1. Descriptive statistics**

The weighted descriptive statistics for the main variables used in the empirical analysis are displayed in Table 1.

Here we observe the low incidence of highly educated employers: on average, only 23% of firms are managed by an employer with a tertiary education, while 54% are those managed by an employer with an upper secondary education and 23% by an employer with a lower secondary education.

As for the workforce characteristics, Table 1 shows that the share of employees with a tertiary education is 8,5%, while the shares of employees with upper secondary and lower secondary education are 44,5% and 47%, respectively. The low average educational attainment of employment reflects the weakness of labor demand for qualified workers in Italy already found by previous studies (Naticchioni, Ricci and Rustichelli, 2009). The share of employees who have attended a training course organized by firms is only 19% on average, a fact in line with both the low propensity of Italian firm to invest in formal training and the complementarity between training investment and schooling at workplace.

Turning to firms characteristics, it is worth to noticing the predominant presence of the smallest firms (between 5 and 14 employees) (77%), while less than 1% of them employ more than 250 employees, and those family-owned (90%) which typically require less formal education and skills to be managed than firms large in size and market-owned (Bandiera, Barankay and Rasul, 2006; Leazar, 2010).

Table 1 also shows that firms are mainly localized in Northern regions (30% in the North-West and 26% in the North-East). The descriptive picture is completed by observing that Italian firms

are specialized in manufacturing (28%), in construction (14%) and in some service sectors like retail and wholesale (23%) and hotels and restaurants (11%). Instead, there is a limited presence in those service sectors highly intensive of human capital and skills: financial intermediation and insurance (1%), information, communication and other business services (7%) and health, education and private social service (2%).

In sum, the descriptive analysis already makes it evident a possible link between the low incidence of employers with higher education and the specific characteristics of the Italian productive system, managerial markets and ownership structure.

#### 4. Econometric analysis

The econometric analysis is performed by estimating the following equation:

$$(1) \quad FT_i = \alpha \cdot educ\_grad + \beta \cdot D_c + \delta \cdot W_i + \chi \cdot F_i + \varepsilon_i$$

where the dependent variable  $FT$  is the share of fixed term contracts, calculated on the total number of employee in firm  $i$ ,  $educ\_grad$  is a dummy variable indicating whether the employer is graduated while  $D_c$  is a density indicator, namely it is the share of employers with a tertiary level of education in the province  $p$  and sector  $c$  in which firm  $i$  is located, and represents the possible source of the entrepreneurial human capital spillover. The vector  $W_i$  describes the composition of the firm workforce,  $F_i$  is a vector containing other firm and workplace characteristics and  $\varepsilon_i$  is an idiosyncratic error term (for details see Appendix).

When we deal with the impact of employer educational spillovers a potential problem with standard IV (and OLS) estimates is the presence of unobserved heterogeneity and endogeneity issues. In particular, the IV estimates would suffer from omitted variable bias, if there are unobservable factors influencing both the average incidence of employers with a tertiary level of education in the sector and/or province in which firm operates and its propensity to hiring on temporary basis.

There may be a number of reasons why more educated employers might have a lower propensity to hire workers on temporary basis. For example highly educated employers might be more likely to be concentrated in firms operating in those sectors characterized by high quality management practices, learning by doing and cooperative industrial relations which themselves are less favorable to the use of flexible staff arrangements. In this case, if employers with a tertiary degree of education tend to be found in firms using a low share of fixed term contracts, this negative correlation may be partially reflects firms unobserved heterogeneity rather than skills and behavior associated with the schooling level of employers, leading to biased estimates.

To deal with this problem, a set of variables intended to capture observable firms, workers and employer characteristics has been included in different specification of equation (1) in order to reduce the omitted variable problem.

A related issue that we must take into account is reverse causality, in particular the relationship between the non-random highly educated employers' localization and the firms' behaviour about fixed term hiring. To address it, we adopt an instrumental variable approach, to identify the causal impact of entrepreneurial human capital spillovers on the share of fixed term contracts.

We recover the province share of individuals with a tertiary level of schooling over the total population drawn from Census data in 2001, denoted by the variable  $Z$ , as instrument.

The rationale for his choice is that human capital endowments found in the local markets in 2001 is persistent over time and significantly associated with the schooling level of employers operating in the same geographical area in the year 2010 but most probably not with their current choices. In other words, a large share of graduates in 2001 predicts an increase in the probability to find a highly educated employer in the firms operating in the same province ten years later. Conversely, the province share of individuals with a tertiary level of schooling in 2001 is unlikely to be correlated with the share of fixed term workers employed by firms operating in the same area in the year 2010. This is because the share of fixed term contracts (mainly for what regards

new hires) is a current phenomenon and it is intimately affected by the exogenous process of labor market reforms which is strongly variable over time<sup>1</sup>.

#### *4.1 Explorative results*

The OLS estimates of equation (1) are displayed in Table 2. Here we show that the agglomeration of graduate employers at province/sector level ( $D$ ) significantly reduces the overall share of fixed term contracts used by firms operating in the same economic environment.

This (negative) educational spillover on the incentive to hire on temporary basis is significantly higher in magnitude than the (negative) effect found for the individual level of education.

Indeed, Table 2 shows that the estimated coefficient associated to the dummy indicating the presence of a graduate employer is -0.01 while that relative to the variable  $D$  is about -0.07. In other words, these preliminary findings indicate that those individual channels through which the investment in education is expected to translate into “best practices” of HRM are magnified by the proximity of other highly educated employers.

Table 2 makes it apparent a remarkable direct impact of employment composition on the type of labor contract offered by firms. In particular, firms with a high proportion of highly educated workforce are likely to use more fixed term contracts: the average partial effects associated with the share of workers with tertiary education is 8.8 percentage points. This finding supports the previous evidence about an occupational mismatch for highly educated workers in Italy. The labour market reforms enacted have progressively favored personnel policies based on labor cost-saving for newly hired workers. This has increased, in turn, the likely that young workers with a

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<sup>1</sup> Another way to explain this exogeneity at work is that a college graduate employer can appear with more probability where other college graduates are located, therefore using  $Z$  we are able to catch out this sort of “network effect” from the variance of  $D_c$ . A similar strategy is advised in Combes et al. (2011) when we aim to identify spillover effects in agglomeration economies.

tertiary education were assigned to low “quality” jobs under fixed term contracts (Naticchioni, Ricci and Rustichelli, 2008)<sup>2</sup>.

Conversely, a high proportion of trained workers is associated with an intensive use of temporary contracts. This is in line with expectations, as the returns of on the job training for a firm typically require long job tenure and firing a trained worker implies the loss of the shared investment in specific skills. As well, employees subject to fixed term contracts are likely to exert a lower effort with respect to permanent ones performing the same task given the higher probability to lose their jobs (Boone, Belot, van Ours, 2007).

OLS estimates of equation (1) show interesting results also for firm’ characteristics, as ownership and governance structure, exposure to foreign markets and innovative investments. In principle, these covariates are expected to affect the process of employers selection, their average level of human capital and, then, the firms’ incentive to use fixed term contracts.

In particular, Table 2 indicates that family involvement in ownership and corporate governance discourages the use of permanent workers. Our results support the idea that a management recruited on efficient basis rather than on informal ties is expected to be more confident with those human resource management (HRM) that increase the opportunity costs of using too much flexible arrangements. This relationship does not strictly depend on ownership structure: what is worth is the selection of managers with adequate skills and competencies more than the family governance of this recruitment process.

In sum, taking into account a number of firms and workforce characteristics does not alter the robustness of the negative impact of educational spillovers on the share of fixed term contracts.

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<sup>2</sup> To better understand this result that sharply contrasts with the international literature, one may refer to the following argument (Portugal and Varejio, 2009). It is well known that a key factor behind the choice of the contract offered by a firm is related to its hiring technology. In turn, the hiring technology crucially will depend on the cost of “employment failure” that is expected to increase as we move up in firms hierarchy positions (Rosen, 1982). However the cost of failure increases with the educational level of employment if more skilled workers are hired to fill higher rank position inside the firm. This does not happen when it emerges a significant “mismatch” between the human capital of the employees and the average “quality” of jobs offered by firms. In this case, the positive correlation between the cost of the employment failure and the educational attainments of workforce is considerably weaker. It can be argued that such a situation characterizes the Italian productive system.

This gives us a first support to our hypothesis about the role of educational spillovers stemming from the agglomeration of employers with tertiary education as key determinant of firms hiring policies.

Naturally, the results of Table 2 cannot be conclusive of our analysis, as the magnitude and statistical significance of the OLS estimates may depend on endogeneity issue, as mentioned before. This is what we are going to verify below.

#### *4.2. Instrumental variable estimates*

This section is based on the results of IV linear model estimates displayed in Table 3.

It is worth to note that the findings we are going to discuss can be considered reliable and robust to the issues of endogeneity, observed heterogeneity and selection bias discussed in the econometric part.

Given the fact that we are dealing with a cross section dataset on year 2010, it is better to say something about the fact that this is a particular year in the middle of a serious period of crisis. 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<sup>3</sup> 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.

Our empirical evidence shows that the share of temporary jobs has increased during the crisis and, in particular, over the four quarters of 2010 (Graph 1). Then, our estimated coefficient, and in particular the coefficient of our main variable ( $D$ ), is upward biased, due to cross sectional

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<sup>3</sup> On the one hand, the share of temporary contracts can increase during a crisis, because of their lower firing costs. On the other hand, if firms get rid of temporary contracts at the beginning of the crisis, the relative share of temporary contracts would decrease.

sampling. Nevertheless, as we will discuss soon,  $D$  has a significantly negative impact on the share of temporary employees on total firm's employment. Therefore, intuitively, 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.

We now enter in the details of our results. As in other papers in the literature, also in our findings the role of employer's schooling is important in explaining the propensity to hire temporary employees. Then, despite the inclusion of the variable  $D$ , this covariate does not lose its effect. Tests for weak instrumentation perform well demonstrating that instruments are not weak and our IV strategy is valid.  $D$  is negative and highly significant demonstrating that an agglomeration of highly educated employers affects the individual decision to offer temporary contracts. This 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 other covariates are mainly aimed to control for observed heterogeneity. Firms with a high proportion of higher educated workforce are likely to use more fixed term contracts. As argued above, this finding confirms the previous evidence about an occupational mismatch for highly educated workers in Italy.

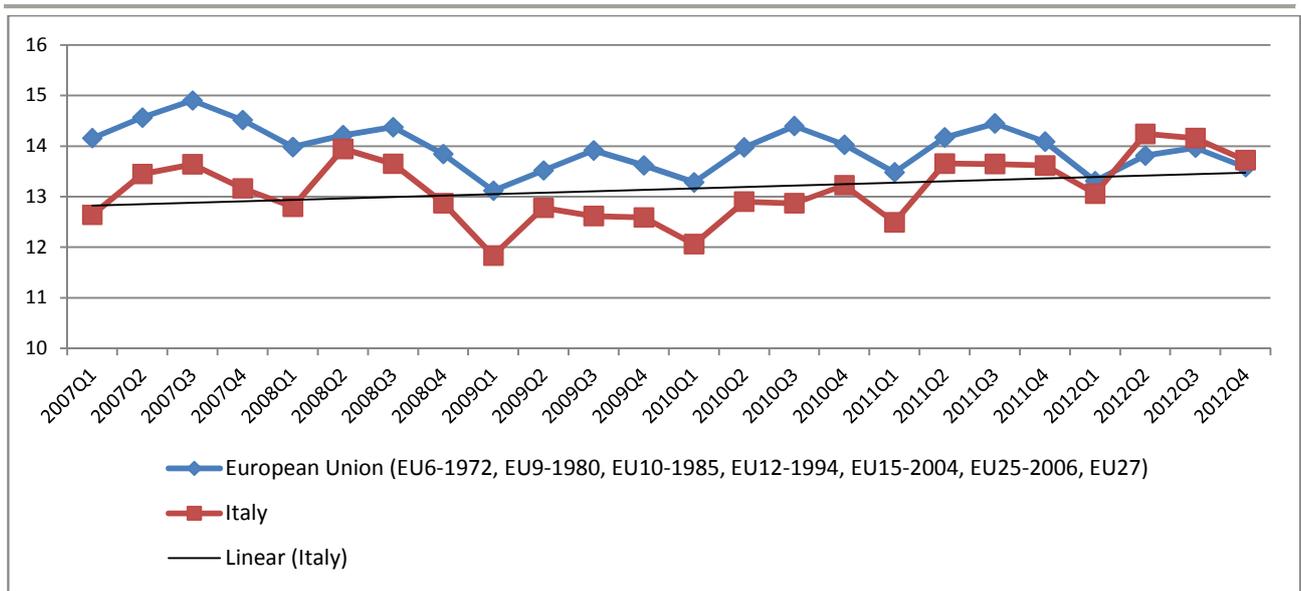
Conversely, as already resulted from OLS estimates, a high proportion of trained workers discourages an intensive use of temporary contracts. It is interesting to notice that in firms with a large proportion of female workers the propensity to hire temporary is higher. This is in line with the fact that female are usually more employed in such activities where temporary contracts can represent a convenient outcome either for supply or demand reasons. Family firms which are usually engaged in non managerial practices and are less inclined to invest in human capital are on average relatively more in favor of hiring on a temporary basis.

## 5. Conclusions

This paper shows that the agglomeration of graduate employers significantly reduces the firms' use of fixed term contracts in a large sample of Italian firms. This result is robust to the use of different estimation strategies in order to deal with endogeneity concerns derived from the agglomeration effect as well as the cross section dependence problems affecting standard errors. To the best of our knowledge, this paper is the first one to shed light on this issue.

These findings also indicate that spillovers deriving from the human capital of employers represent a potential channel through which reducing the insider-outsider divide in the labor market. These results appear valuable on the grounds of policy implications since they point out the importance of the individual profile of the employers for the adoption of "high road" human resource management practices as opposed to "low road" ones. In particular, policy measures aimed at enhancing the clusters of highly educated employers may significantly contrast the perverse effect of fixed term contracts on labor market, favoring competitive strategies based on innovative performance, accumulation of firm specific skills and productivity growth (Oecd, 2008).

**Graph 1 - Share of temporary employees on total employment (15-64 years old)**



Source: Eurostat online dataset

**Table 1: Descriptive statistics with sampling weights**

	Mean	Std dev	Min	Max
% employees with fixed term contract	0.143	0.226	0	1
employer with tertiary educ	0.231	0.421	0	1
employer with secondary educ	0.543	0.498	0	1
employer with elementary educ	0.227	0.419	0	1
% employees with tertiary educ	0.085	0.168	0	1
% employees with secondary educ	0.444	0.307	0	1
% employees with elementary educ	0.471	0.342	0	1
% female	0.378	0.295	0	1
% trained	0.188	0.327	0	1
% white collars	0.361	0.322	0	1
family firm	0.905	0.293	0	1
process innovation	0.303	0.459	0	1
product innovation	0.385	0.487	0	1
export	0.221	0.415	0	1
unemployment rate 2009	0.073	0.034	0	0
% new hires 2009	0.514	0.500	0	1
4 <n. employees <15	0.768	0.422	0	1
14 <n. employees <50	0.188	0.391	0	1
49 < n. employees <250	0.039	0.193	0	1
n. employees > 249	0.006	0.075	0	1
North Ovest	0.302	0.459	0	1
North East	0.265	0.441	0	1
Centre	0.215	0.411	0	1
South	0.218	0.413	0	1
sector_1	0.002	0.050	0	1
sector_2	0.280	0.449	0	1
sector_3	0.010	0.100	0	1
sector_4	0.139	0.346	0	1
sector_5	0.223	0.416	0	1
sector_6	0.034	0.181	0	1
sector_7	0.111	0.314	0	1
sector_8	0.014	0.116	0	1
sector_9	0.050	0.218	0	1
sector_10	0.086	0.280	0	1
sector_11	0.023	0.150	0	1
sector_12	0.029	0.167	0	1
% of graduates in prov 2001	0.051	0.013	0	0
D	0.256	0.146	0	1
<b>Number of obs</b>		10987		

**Table 2: OLS estimates; dep var: total share of fixed term contracts**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
D	-0.0739***	-0.0593**	-0.0545**
	-0.0246	-0.026	-0.0258
employer with tertiary educ	-0.0154***	-0.0145***	-0.0119**
	-0.0046	-0.0051	-0.0051
employer with secondary educ	-0.0002	0.0033	0.0042
	-0.0043	-0.0045	-0.0046
% employees with tertiary educ		0.0886***	0.0951***
		-0.0138	-0.0143
% employees with secondary educ		0.0209***	0.0214***
		-0.0078	-0.008
% female		0.0506***	0.0500***
		-0.0092	-0.0094
% trained		-0.0270***	-0.0278***
		-0.0048	-0.0047
% white collars		-0.0685***	-0.0676***
		-0.01	-0.01
family firm			0.0195***
			-0.0041
process innovation			-0.0083**
			-0.004
product innovation			0.0123***
			-0.0038
export			-0.0128***
			-0.0036
unemployment rate 2009			0.1943
			-0.1234
hires in 2009		0.0731***	0.0729***
		-0.0036	-0.0037
region dummies	yes	yes	yes
sector dummies	yes	yes	yes
size dummies	yes	yes	yes
Constant	0.0742***	0.0559***	0.0244
	-0.0108	-0.0116	-0.0151
Observations	14,307	11,228	10,987
R-squared	0.1463	0.1836	0.1868

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Robust standard errors in parentheses; omitted variables: % employees with lower educ, employer with lower educ

**Table 3: IV\_2SLS estimates; dep var: total share of fixed term contracts**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
D	-0.1231***	-0.1261***	-0.1175***
	-0.0446	-0.0436	-0.0434
employer with tertiary educ	-0.0213***	-0.0131**	-0.0107**
	-0.0054	-0.0053	-0.0053
employer with secondary educ	-0.0018	0.0027	0.0038
	-0.0047	-0.0046	-0.0047
% employees with tertiary educ		0.0910***	0.0975***
		-0.0139	-0.0144
% employees with secondary educ		0.0199**	0.0207***
		-0.0078	-0.008
% female		0.0510***	0.0501***
		-0.0092	-0.0093
% trained		-0.0275***	-0.0280***
		-0.0048	-0.0048
% white collars		-0.0670***	-0.0664***
		-0.0098	-0.0099
family firm			0.0187***
			-0.0041
process innovation			-0.0083**
			-0.0041
product innovation			0.0121***
			-0.0038
export			-0.0121***
			-0.0036
unemployment rate 2009			0.2173*
			-0.1254
hires in 2009		0.0724***	0.0721***
		-0.0036	-0.0037
region dummies	yes	yes	yes
sector dummies	yes	yes	yes
size dummies	yes	yes	yes
Constant	0.0896***	0.0703***	0.0369**
	-0.0138	-0.0133	-0.0162
Observations	11,442	11,120	10,933
R-squared	0.1363	0.1834	0.1868

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Robust standard errors in parentheses; omitted variables: % employees with lower educ, employer with lower educ

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