



## Work Flexibility and Workplace Training in Italy Before and After the Jobs Act Reform

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**Abstract:** This paper analyses the complex relationship between work flexibility strategies and workplace training at the firm level, thus filling a gap in the relative literature that only takes into account supply-side factors and fails to discriminate between on- and off-the-job training. To achieve this purpose, we discuss the implications of two different theoretical frameworks grounding on human capital theory and systemic flexibility, respectively, and go on developing alternative hypotheses on the association between the presence of temporary and part-time workers at firm-level and training investments, both off-the-job and on-the-job. By using data on Italian firms, we get different results according to the type of non-standard contract and training. Part-time and temporary contracts carry out distinct functions with respect to off-the-job and on-the-job training, respectively. The former is more consistent with the human capital approach, whereas the latter is in line with the strategic management approach. These results are discussed in view of a structural labour market reform enacted by the Italian government in 2015, the so-called “Jobs Act”.

JEL classification: J24, M53, M54

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## 1 Introduction

In the last two decades, European countries delivered labour market reforms aimed at fostering the diffusion of flexible contracts as a mean to enhance work flexibility and boost employment rates. This transition may have negatively affected firms' training decisions by reducing incentives to invest in human capital as flexible contracts usually have limited expected payback period for such investments. For the same reason, precarious workers are inhibited to actively participate to training programs and achieve the expected learning outcomes. Given that "training matters enormously because of the importance of skill formation at work in a modern-day economy" (Green et al., 2016) this possible trade-off has been related to the unsatisfactory growth of labour productivity in Italy and other European countries characterized by segmentation of labour markets (Bassanini et al., 2005), raising concerns on the sign of the relationship between workplace training and the diffusion of flexible employment, notably part-time and temporary jobs.

On theoretical grounds, two distinct approaches have been developed for the analysis of the interactions between training and firms' requirement of work flexibility. The first and dominant approach, at least in the domain of economics, is rooted in the human capital theory and its derivations and developments. The focus of these models is mainly on the conditions and the incentives that favour the financing of employees' training by the employer and/or by the employees themselves. In these models, labour flexibility plays a key role by affecting the expected tenure of employees and, in this way, the time needed to pay back employers' investment in training. The second approach is based on the strategic management view of the firm. In this perspective, the firm is conceived as a complex system in which personnel practices interact one each other and can be understood only by taking into account the cobweb of relationships among different practices. Accordingly, training practices interact with work flexibility strategies and this complex relationship affects the employers' choices.

An extensive strand of empirical literature has explored the relationship between flexible contracts and training investments from the supply-side, using information on household and individual workers. Conversely, few studies have investigated this effect from the labour demand standpoint, using firm-level data, despite the employers are the key decision makers for firm personnel and training policies. Moreover, most of these studies often nest together on-the-job and off-the-job training due to the unavailability of separate data. Yet, these two types of training are rather different in nature.

The complex interplay between work flexibility strategies and managerial policies towards workplace training deserves particular attention when reference is made to the Italian context. Like in many

European countries, the distinction between flexible and permanent employment has acquired relevance over the past decades further to a wave of institutional reforms that pursued flexibilization to favour labour market efficiency and increase labour supply (Barbieri et al., 2019). Further to these reforms, Italy has been considered a typical case of institutionally driven insider–outsider scenario (Palier and Thelen, 2010) in which the duality of the labour market mainly concerned the divide between permanent and fixed-term workers (Berton and Garibaldi, 2012), and to a more limited extent between part-time and full-time workers. During the same period, Italian labour productivity levels significantly lagged behind those of other EU and OECD countries. This evidence has raised concerns on how to leverage on training investments to bridge the “productivity gap” that plagues Italy (Bugamelli et al., 2018; Calligaris et al., 2018). The consequent call to mitigate labour markets dualism in Italy paved the way for further institutional reforms, eventually leading to the adoption of the so-called “Jobs Act” in 2015. Such reform tried to reduce the gap between insiders and outsiders mainly by reducing legal employment protection associated with open-ended contracts, reducing the room for the applicability of atypical semi-independent contracts, and subsidizing firms hiring fresh workers on a permanent basis.

Against this background, the objective of this paper is twofold. First, it aims at shedding light on the relationship between workplace training and labour market flexibility practices in Italy after the enactment of the first wave of reforms (“enhancing flexibility reforms”). In particular, by assuming that part-time and temporary workers represent the flexible tier of the workforce, we test a set of hypotheses stemming directly from the two theoretical approaches previously introduced by using cross-sectional firm-level microdata. In this way, the paper fills a gap in the extant literature by focusing on demand-side decisions in terms of training policies and discriminating between on- and off-the-job training (e.g. Forrier and Sels, 2003). Second, it aims at discussing the potential changes to this relationship brought by the implementation of the “Jobs Act” to provide the basis for future empirical investigations on the effects of this recent reform on workplace training.

The rest of the paper is organized as follows. Section 2 develops the theoretical framework based on the human capital and the functional flexibility approach, respectively. Section 3 describes the two waves of institutional reforms that restructured the Italian labour market during the last two decades. Section 4 describes the dataset and defines the empirical strategy. Section 5 presents the results. Section 6 paves the way for future research based on post-“Jobs Act” microdata. Section 7 concludes.

## 2 Theoretical Background

### *2.1 Training Investments and Flexible Workers in the Human Capital Literature*

The human capital literature identifies two dichotomous types of training, general and specific, according to the degree of skills' transferability (Becker, 1964). The skills developed through general training can be used by both current and future employers. Conversely, specific training generates benefits only in the current occupation and in the employing firm. In perfectly competitive markets, employers can share with employees the financing of specific training, but they are not available to fund general training programmes. The employer's availability to pay for employees' training is related to her capability to capture a fraction of the economic rent generated by training. As a result, the availability to invest in training also depends positively on the expected length of the employment relation. However, more recent economic developments in the realm of human capital theory found that, if one relaxes the assumption of perfectly competitive markets, employers can also find convenient the financing of general training (Katz and Ziderman, 1990; Acemoglu and Pischke, 1999). A similar outcome is achieved in presence of a mixed training intervention that allows the firm to partially recapture its general training outlays (see, Kessler and Luelfesmann; 2006; Brunello, 2001)

Based on this theoretical framework one can discuss the relationship between the different typologies of labour contract and the provision of training. Definitely, if the employers' availability to provide training is positively affected by the expected length of the employment relation, then one can expect that workers with open-ended contracts are more likely to receive training than workers with a fixed-term labour contract. This expectation is even stronger for part-timers. The high share of workers involuntarily in a part-time employment reduces the expected tenure of this tier of the workforce. Moreover, they have less working hours to be allocated to learning activities. They are also less likely to cover core job positions due to their peculiar skill endowment that place them outside the full-time labour market (Yamaguchi, 2012).

Basically, according to the human capital theory, the role of these non-standard employment contracts is to strengthen the firm's labour flexibility, minimising the amount of training attached to these contracts. Most of the empirical studies support the view that workers with open-ended contracts are more likely to receive training than non-standard ones (Oosterbeek,

1996; Arulampalam and Booth, 1998; Forrier and Sels, 2003, Almeida-Santos and Mudford, 2004; Albert et al., 2005; Sauermann, 2006; O'Connell and Byrne, 2012; Cabrales et al., 2014). Likewise, comparative analyses generally support the existence of a negative correlation between training opportunities and non-standard workers in European countries (Bassanini et al., 2005; European Commission, 2010; OECD, 2002). Yet, they show a statistically significant lower training probability for temporary and part-time workers with respect to a limited number of countries (Arulampalam et al., 2003; Albert et al., 2010).

However, few studies have investigated this effect from the labour demand standpoint, despite the fact that the decision whether to train or not rests mainly on the employer, who usually finance the relevant investment. Some demand-side based studies examine related issues (e.g. Forrier and Sels, 2003b), but do not focus on non-standard employment nor they disentangle between part-time and temporary workers. Most of the existing evidence is therefore partially biased by the measurement error attached to the distance between employers' and employees' responses regarding the provision of informal training and the intensity of formal training.

## ***2.2 The Job Competition Model and the Resource-based View of the Firm***

The job competition model (Thurow, 1975) is based on a set of assumptions, which differentiate radically it from the human capital theory. These assumptions concern both the operation of labour markets and the internal dynamics of firms. First, workers compete for jobs on the basis of a set of characteristics indicating their trainability. They do not compete on the level of wage which is exogenous with respect to the labour market. Wages do not react to excess supply of labour: their determination depends on the structure of the internal labour market and the internal organisation of work. Second, any job opening requires some form of training provided after the activation of the employment relation. In order to fill a vacancy, the employer positions the applicants along a queue, ranking them on the basis of a set of background characteristics such as education, previous working experience, age. These indicators are proxies of expected cost of training for the applicant in a specific and well-defined job position. These procedures of hiring carried out by firms may not be compatible with the target to pursue static efficiency in the short-run, but in the medium-run they can favour the pursuit of dynamic efficiency, through a rise of labour productivity.

The job competition approach is consistent with the view of skills formation as a firm's idiosyncratic process, devised within the resource-based view of the firm (Teece et al., 1997). The process of skill formation is a strategic tool in the hands of the firm's management for the pursuit of dynamic efficiency. In these approaches the firm is conceived as a system of interrelated and complementary techno-organisational practices. These practices interact with one another and establish a network of complementary relationships. Applying this conception to personnel practices, this implies that positive complementarities among distinct workforce development practices can be set up. In this way, one has to take into account not only the single practice but also the coordinated operation of the overall bundle of practices (e.g. Ichniowski et al, 1997). Hence, the effects of the recourse to non-standard working arrangements such as part-time and/or fixed-term labour contracts depends on the interaction with the other job-related practices, within a frame of complementary relationships designed by the management. As a result, the effects of these two practices on the provision of training are not as clear-cut as in the human capital approach. Even though either part-timers or temps are hired just for mere numerical or payroll flexibility purposes, the effect of either of these practices on training may be positive, contrarily to the prediction of the human capital theory. In fact, the adoption of either of these two practices brings about the segmentation of the internal labour market into two tiers, one stable and the other one unstable. The role of the unstable component is to provide flexibility and to structure the internal labour market so that the management can apply skill development measures to the employees with standard employment contracts in order to contribute to smooth their firm-internal career (Sanders and de Grip, 2004) and cultivate a kernel of core competencies able to differentiate the firm from the others (Green, 2013). In this way a positive relation between either of these two practices and training of employees can be observed, despite employees with non-standard contracts do not benefit from any form of training.

### ***2.3 Distinguishing Between Off-the-job and On-the-job Training***

For both the approaches to the analysis of skill development the heterogeneity of skills' portfolio is an important element in the economic analysis of training. Training can be distinguished between off-the-job and on-the-job training. Off-the-job training is undertaken away from the work position. It includes both the formal component of training provided through internally organized courses, and the whole range of external training provided by business schools, vocational and technical institutes,

and consulting companies. Although it is not possible to exactly separate in each training intervention the general component from the specific one, we can assume that in external courses the development of general skills prevails (Booth and Bryan, 2002; O'Connell and Byrne, 2012).

On-the-job training encompasses all the training practices taking place during working hours, very often in informal way. The range of on-the-job training practices is rather wide. It includes the learning of sophisticated techniques, developed in-house, but also the acquiring of specific knowledge related to menial tasks. This kind of training is expected to be mainly firm specific and can be viewed from two different perspectives. As a standing alone practice on-the-job training is characterized by short interventions attached to specific skills that may soon become obsolete. In such case the presence of non-standard employment should not penalize on-the-job-training because this type of training is the main answer to the need for (initial) training and is provided to all employees indistinctly at the time of hiring. On the other hand, on-the-job training can be considered as a component of a bundle of interrelated organisational practices that are designed to move towards high-performance strategies (Whitfield, 2000). This implies that the presence of non-standard workers may lead to the adoption a wide set of mutually complementary and reinforcing job-related practices in the light of the higher heterogeneity of the workforce composition. Additionally, on-the-job training can be quite informal, not systematic and difficult to monitor. Such characteristics can hamper the possibility to measure its actual intensity and bring about an underestimation of its effects on labour productivity (Nordman and Hayward, 2006). For this reason in most of the empirical studies on-the-job training is usually measured through a binary variable attached to the propensity to train rather than a continuous or discrete variable associated with training intensity.

Following our theoretical reasoning we proceed to formulate the hypotheses to be tested in the subsequent empirical analysis. Namely, we formulate two hypotheses, each of them related to a type of training and then divided into two different statements: the first statement is related to the human capital approach, whereas the second statement derives from the systemic approach to the analysis of the firm and its training practices. However, it is important to underline that each statement does not rule out the other one.

First, we can expect a relatively lower provision of off-the-job training in presence of a large buffer of flexible and easily replaceable workers. A higher job instability would be associated with a shorter expected duration for the firm to recover training investments. *Ceteris paribus*, this would lead to a lower intensity of off-the-job training at firm level. This expected correlation is deemed to be stronger in presence of part-time workers due

to their reduced working hours that make off-the-job training relatively more costly.

*Hypothesis 1a*

*Resorting to flexible employment is negatively associated with off-the-job training intensity. This relationship is stronger in presence of part-time workers rather than temporary ones. (Human capital approach)*

However, once considering the different dimensions of flexibility, and considering the firm as a cobweb of interconnected organisational arrangements, one can claim that training practices and attempts to intensify the numerical flexibility are complementary and can reinforce each other. Firms employing a relatively high share of temporary workers may hoard permanent workers with high tenure, even in case of recessions, and provide substantial amounts of training to this core group of employees to meet their skill improvement needs. In this way a positive association between the adoption of flexible practices and the intensity of off-the-job training can be observed.

*Hypothesis 1b*

*Off-the-job training intensity is positively associated with the presence of flexible workers. This relationship is stronger in presence of temporary workers rather than part-time ones. (Flexibility approach)*

The human capital approach does not predict, instead, a univocal relation between non-standard employment and the provision of on-the-job training. In fact, if we consider a simple two-period model we can claim that firm's propensity to provide on-the-job training depends on the time distribution of the benefits accruing to the organization. If such benefits are concentrated in the initial period, the presence of flexible workers is should not affect off-the-job training investments, not on-the-job training decisions of the employers. Similarly, if on-the-job training is associated with the initial training providing to fresh employees, one can expect that the presence of non-standard staffing practices does not affect significantly on-the-job training decision.

*Hypothesis 2a*

*Resorting to flexible employment is not associated with the propensity to invest in on-the-job training (Human capital approach)*

On the other hand, for the same reasons as those outlined for off-the-job training, one can assert that on-the-job training and numerical flexibility can



be positively associated. Employers can respond to new skills requirements, by providing further on-the-job training to the stable tier of the workforce.

This argument is reinforced if on-the-job training and off-the-job training are complementary.

*Hypothesis 2b*

*Resorting to flexible employment is positively associated with the propensity to invest in on-the-job training. (Flexibility approach)*

### **3 Labour Market Reforms and Flexible Employment in Italy: Main Regulatory Interventions.**

#### **3.1 Enhancing-flexibility Reforms (1997-2003) and its**

##### ***Consequences***

Italy has been fully involved in the process of increasing dualization of the labour markets that characterized all Western Economies during the last decades. Since the early 1990s, in fact, extensive two-tier reforms have been implemented in this Mediterranean country as well (Boeri, 2011; Berton and Garibaldi, 2012). Following the enactment of laws 196/1997, 368/2001 and 30/2003, the pre-existing rules that had limited the use of fixed-term and part-time contracts were substantially relaxed (Berton et al., 2013). This reformatory process led to a wider use of temporary and part-time contracts by the employers and eventually to the adoption of a two-tier employment protection regime (Ordine and Rose, 2016).

Due to the increasing diffusion of flexible employment, especially among disadvantaged cohorts and social groups, two-tier reforms have been increasingly criticised (Barbieri et al., 2019). In particular, they have been called into question when trying to explain the productivity slowdown that plagued Italy over the same period (Calligaris et al., 2018). Namely, the fact that this flexibilization of employment protection schemes was not accompanied by policies intended to favour a participation expansion of workforce in training activities during the transition phase from one job to another one (i.e., active labour policies) is often cited as a major explanatory argument of this productivity drop (Capellari et al., 2012). In addition, labour market segmentation usually has a negative impact on firm-provided training due to the higher job volatility of flexible employment relationships (Cabrales et al., 2014). However, data concerning employees' participation in training activities shows controversial evidence when reference is made to the Italian labour force.

### ***3.2 The reform of the labour market in the Jobs Act***

Increasing awareness concerning the shortcomings of two-tier reforms led scholars and policy makers to elaborate innovative reform proposals to rationalize employment protection, expand active labour market policies application and enhance the effectiveness of social protection schemes (Boeri and Garibaldi, 2008; Cahuc, 2012; Blanchard and Tirole, 2008). Following a decade-long political debate on the matter, the Italian Government eventually intervened in 2015, by enacting the Legislative Decree 23/2015 (so-called Jobs Act). The Jobs Act (henceforth JA), issued by the Italian government in 2015, is one of the most radical and thorough reform of the labour market approved in these last 20 years. For our interests it is important to briefly outline four different items which have been addressed and put into act.

1. JA reforms the standard open-ended employment contract. Particularly, it significantly eases the procedure of employees' firing with the introduction of a refunding (severance) payment for termination, which is supposed to be proportional to the employees' seniority;
2. JA aims at discouraging the use of atypical employment contracts, such as semi-independent and bogus self-employed, by abolishing the so-called co-co-pro (contratti di collaborazione a progetto, in Italian);
3. JA eases the binds to change in the range of tasks that the worker has to carry out;
4. JA attempts to reform public employment services through the introduction of the National Agency for Labour Active Policies.

#### ***3.2.1 Preliminary Evidence on the Effects of the Jobs Act in the***

##### ***Economic Literature***

By potentially influencing the demand for flexible workers as well as the total cost of permanent employees, the introduction of JA is expected to affect the relationship between workforce composition and training investments at firm level in a threefold way. First, relaxing firing restrictions may reduce workers' bargaining power, thus "favouring the shift towards cost-competitiveness strategies instead of technological ones based on investments, training and organizational innovation" (Cirillo et al., 2017, 216). Second, the projected reduction of flexible employment associated with the increase of permanent contracts (Sestito and Viviano, 2016) may provide firms with higher incentives to train their workers if one considers

training as a firm-specific investment that implies sunk costs and a substantial time span between the time of the investment itself and the period of investment returns. Third, JA may affect training investments by modifying the relationship between the different types of labour flexibility (Catalano and Pezzolla, 2017).

## 4 The Empirical Analysis

### *4.1 Dataset and Descriptive Statistics*

In absence of available data relative to the post-JA period, we carried out an empirical analysis referred to the previous institutional stage, called “enhancing-flexibility”. In this way we get evidence on the relationship between training and flexibility potentially changed by the enactment of the JA. It is particularly useful to analyse the extent to which different employment relationship types and working arrangements differently impact on training possibilities as a significant increase of the share of workers employed either with a fixed-term contract (CNEL, 2021) or based on part-time work arrangements (Cirillo et al., 2017) took place in the aftermath of the JA reform. For this investigation we use data from the Survey on employee training in Italian firms performed by the National Institute of Statistics (ISTAT) in 2006 (reference year 2005) and released in 2012. The survey was delivered to a representative sample of firms employing more than 10 employees, which has been weighted with respect to the population according to the characteristics of the non-respondents of the targeted sample (52.1%). These data allow us to distinguish off-the-job from on-the-job training, and to disentangle non-standard workforce between part-time, and temporary workforce. Temporary employment is measured through the presence of workers on “non-training temporary contracts” which refer to any fixed-term contracts that contain no mandatory training clause (Devicienti et al., 2018). This definition excludes not only apprentices, whose contracts are extremely different from the other ones in the Italian regulatory setting, but also workers on training and work contracts and job insertion contracts. Part-time employment includes those individuals that are required to work for the firm less than 30 hours per week. Data also provide different proxies of off-the-job training intensity: hours/days of training per employee, the number (or the proportion) of trained employees, training costs, and the content of training activity. Among the 15,470 surveyed firms 6,439 (41.6%) provide some kind of off-the-job firm-sponsored training (either internal or external). On the other hand, 2,533 firms (16.3%) provide on-the-job training (defined as a scheduled period of training, learning or practical experience to be carried

out on the site or in the work situation), but 88.9% of them is also engaged in off-the-job training. Overall, 43.45% of the firms are engaged in some form of training while 2,128 (14.55%) have provided both.

Table 1 reports descriptive statistics on training incidence and intensity, and employment structure. The share of workers that participate in training activities is 40.75% for off-the-job training and 29.03% for on-the-job-training. Off-the-job training intensity is also low, amounting to 11.6 hours per employee per year, while yearly training costs amount to 576 Euro per employee. In terms of contents, off-the-job training can be considered as mostly general, as expected. Almost the totality of off-the-job training firms develops some kind of general skills (96%), while specific contents are provided by 62% of the sample.

**Table 1 – Descriptive Statistics**

All firms				Training firms		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
<b>Employment structure</b>						
Number of employees (EMPL)	15,470	135.9729	85.4404	6,721	262.239	1280.129
Proportion of males (MALES)	15,470	0.7104	0.2621	6,721	0.7136	0.2385
Proportion of young workers (YOUNG_WORK)	15,470	0.0631	0.0984	6,721	0.0605	0.0901
Proportion of old workers (OLD_WORK)	15,470	0.0747	0.0890	6,721	0.0705	0.0799
<b>Quantity of labour</b>						
Working hours per employee (WORK_HOURS)	15,470	1,592	312.7367	6,721	1,612	286.5265
<b>Labour costs</b>						
Labour cost per employee (LAB_COST_EMPL)	15,470	31,391	14,325	6,721	36,544	16,318
Labour costs per hour (LAB_COST_HOUR)	15,470	19.980	9.2432	6,721	23.027	10.7356
<b>Training incidence</b>						
Off-the-job train (OFF_TRAIN)	6,439	0.416				
On-the-job train (ON_TRAIN)	2,533	0.164				
At least one type	6,721	0.435				
Both types	2,251	0.146				
<b>Off-the-job training intensity</b>						
Hours per employees (OFF_HOURS)				5,986	11.667	17.6437
Cost per employee (COST_EMPL)				5,986	576.918	880.6824
Participation rate (OFF_PART)				5,986	0.407	0.3661
<b>On-the-job training intensity</b>						
On-the-job participation rate (ON_PART)				5,986	0.290	0.2862
<b>Non-standard employment</b>						
Presence of temporary workers (TEMP)				5,986	0.599	-
Presence of part-time workers (P_TIME)				5,986	0.688	-
Number of apprentices (APPR)				5,986	4.602	22.500
<b>Organization</b>						
Training department (TR_DEP)				5,986	0.382	-
Training responsible (TR_RESP)				5,986	0.621	-
Training plan (TR_PLAN)				5,986	0.552	-
Training budget (TR_BUDG)				5,986	0.398	-
Contract clauses related to training (TR_CLAUS)				5,986	0.272	-

Trade unions' involvement (UN_INV)	5,986	0.309	-
<b>Evaluation of training effectiveness</b>			
Trainees' satisfaction (WORK_SAT)	5,986	63.08	-
Learning achievements (LEARN_ACH)	5,986	28.80	-
Workers' performance (WORK_PERF)	5,986	51.84	-
Organisational performance (ORG_PERF)	5,986	29.29	-
<b>Content of training courses (Hours per employees)</b>			
Technical	5,986	3.770	12.230
Marketing	5,986	0.985	4.542
Managerial	5,986	1.788	5.957
IT	5,986	1.281	6.137
Administrative	5,986	2.274	6.880
Foreign languages	5,986	0.896	3.556
<b>Job-related practices</b>			
Job rotation (JOB_ROT)	5,986	7.91	
Quality circles (QUAL_CIRC)	5,986	2.98	
Self-learning (SELF_LEARN)	5,986	3.98	

General training also prevails in terms of intensity: on average, in the respective subsamples, only 4.8 hours out of 13.6 can be considered as specific while general contents count for more than 9 hours out of 11.7. Furthermore, descriptive statistics show that most of training firms employ non-standard workers. In half of the cases, they employ both types of workers, while 20.26% of them do not employ any. Few firms, however, offer training interventions that are specifically targeted for these types of workers (3.47% for part-time workers and 7.81% for temporary workers).

The existence of a correlation between off-the-job and on-the-job training is supported by the analysis of Pearson coefficients (0.42). Other correlation coefficients are reported in Table 2.

**Table 2– Pairwise Correlations**

Id	Variables	1	2	3	4	5	6	7	8
1	EMPL	1.00							
2	P_TIME	0.10	1.00						
3	TEMP	0.11	0.34	1.00					
4	UNSKIL	0.10	0.20	0.28	1.00				
5	OFF_HOURS	0.83	0.08	0.08	0.07	1.00			
6	OFF_PART	0.03	0.08	0.01	-0.04	0.09	1.00		
7	ON_PROP	0.09	-0.01	0.11	0.10	0.08	0.15	1.00	
8	JOB-PRACT	0.14	0.16	0.15	0.13	0.13	0.30	0.71	1.00

As expected, the correlation between training variables is positive, although in the majority of the case the magnitude is poor. A major overlap only emerges between the propensity to provide on-the-job training and the presence of at least one job-related practice. Thus, it is meaningful to jointly analyse on-the-job training and job-related practices. On the other hand, the presence of part-time and temporary workers is positively correlated, as expected.

## 4.2 Empirical strategy

In order to assess the relationship between workplace training and non-standard employment, we estimate two econometric models where off-the-job training intensity (*Offint*) and on-the-job training propensity (*Onprop*) depends on the use of non-standard contracts at a firm level. Following Green et al. (2015) on the misleadingness of the use of participation rate, *Offint* is measured through the length of courses expressed in hours per year per employee. *Onprop* is a binary variable that takes the value one if the firm has provided training in 2005 and zero otherwise.

To measure the diffusion of temporary and part-time workers, we use two dummy variables taking the value of unity if the firm employs either temporary (Temp) or part-time (Ptime) contracts, respectively, and zero otherwise. In all the models we introduce a horizontal vector of control variables (X) related to several workplace characteristics at firm level that have been commonly found as determinants of training propensity and intensity: size, employment structure (gender and age), propensity to innovate, industry dummies ("other industries" is the benchmark), trade union recognition, and the organization of training activity. Rationale for this selection is supported by both theoretical and empirical literature. Large firms may be better able to bear the risk associated with investments in general training (Goux and Maurin, 2000) while achieving economies of scale in the provision of specific training (O'Connell, 2007), and are more likely to report the presence of temporary and/or part-time worker in their workforce. Gender and age may affect the employer's willingness to train as well as training intensity. In particular women are less-likely be offered formal on-the-job training than men (Evertsson, 2004), while older workers are less likely to be offered job-related training due to their lower expected payoff (Gelderblom and de Koning, 2006). On the contrary, the younger the worker, the higher the expected return from training, both for the firm and the individual. The propensity to innovate is also expected to be positively related to training and other job-related practices (Gashi et al., 2010). In line with our theoretical framework, a positive relationship between the adoption of job-related practices and training intensity is assumed to be in place (Whitfield, 2000). Finally, the role of trade unions and firm-level

contract clauses in the training decision-making process are also expected to be associated with increased training intensity (Groot, 1999) as well as all variables concerning training organization and evaluation procedures (O'Connell, 2007). In specifying the econometric model for estimating *Offint*, we have to control for potential selection effects deriving from the observation of the dependent variable only for firms providing training (*Offprop*=1). Heckman's sample selection model is one of the standard procedures for treating this bias. However, this method is acceptable only if the dataset provides variables that can be used to identify the sample selection term. Since the variables available in our dataset cannot address this issue a multicollinearity problem is likely to arise. We thus apply a subsample OLS estimator following Puhani's (2000) approach to the following log-linear specification.

$$\ln(Offint_i) = \beta_0 + \beta_1 Temp_i + \beta_2 Ptime_i + \beta_2 X_i + \varepsilon_i \text{ if } Offprop = 1 \quad (1)$$

The second model estimates the probability distribution of *Ontrain*, conditioned on *Offprop*, as a function of the same covariates<sup>1</sup>. In this case, the dataset contains two potential exclusion restrictions: working hours per employees and the amount of compulsory social contributions paid to the State to finance vocational courses. These variables are likely to affect the decision to provide off-the-job training without influencing *Ontrain*. On the one hand, working hours per employee may affect *Offprop* by increasing the opportunity cost of off-the-job training, whereas it is not expected to be correlated with *Ontrain* because on-the-job training take place in the job post and does not make workers lose working hours. On the other hand, training-related social contributions may induce firms to reduce training programs (which can only be off-the-job) and avoid such cost without influencing the decision to provide on-the-job training because the latter is not financed by social contributions. These insights are supported by a test on their exogeneity that excludes the direct influence of these variables on the main equation. Accordingly, we decide to use the following probit model with sample selection (heckprobit) that jointly estimates the following ML functions.

<sup>1</sup> We use this econometric technique due to the structure of the questionnaire administered to firms. In fact, data about part-time, temporary workers, on-the-job training are available only for firms providing off-the-job training and not for all the firms of the sample.



$$\begin{aligned}
 P(Onprop_i = 1) &= P(X'_i\beta_1 + \sigma_{12}\lambda(Z'_i\beta_2) + \varepsilon_i > 0) \\
 P(Offprop_i = 1) &= P(Z'_i\beta_2 + \gamma_i)
 \end{aligned}
 \tag{2}$$

Where  $\lambda(Z'_i\beta_2)$  is the inverse Mills ratio and  $\sigma_{12}$  is the covariance between  $\varepsilon_i$  and  $\gamma_i$ , while  $\beta_2$  is obtained by the probit regression of *Offprop* on the vector of covariates  $Z'_i$  that identify the selection equation. This estimate is then controlled for selection in observables using propensity score matching technique (PSM) for three treatment variables: *Ptime*, *Temp*, and *Unskilled*. After checking that the common support condition is satisfied across more than 95% of treatment and comparison groups, we create matched “treatment” and “control” samples being identical in every other observable respect. Our choice in this respect is to use the kernel matching procedure in view of its capability to maximize precision without worsening bias, while nearest neighbours technique is used as a robustness check. If matching is sufficiently good, differences in the propensity to provide on-the-job training can be used as estimates of the effect of employing either non-standard or unskilled workers on this outcome variable. (Garrido et al., 2014). As a further robustness check to address the potential endogeneity of the main explanatory variables due to reverse causality we also run additional estimates by using the 1-year lagged value of *Onprop* as the dependent variable.

## 5 Results

In this section we discuss the empirical evidence by separately testing the hypotheses worked out in Section 2. Since the empirical analysis relies on cross-sectional data its main limitation concerns the reduced capability to address the endogeneity of non-standard employment with respect to training provision. Accordingly, the discussion of the results focuses on the correlation between training practices and non-standard employment.

In Table 3 one can observe that the diffusion of non-standard employment is divergently associated with off-the-job training according to the type of contract. In all specifications, *Ptime* is negatively related to *Offint*. This evidence confirms Hypothesis 1a with respect to part-time contracts. Conversely, the relationship between *Temp* and *Offint* is positive in the first specification of the model estimated. Firms employing temporary workers provide on average 7% more training than those firms that do not employ this type of workers (+21% if considering the relationship with 1-year lagged probability to provide off-the-job training - see Table A.1 in the Appendix). However, the coefficient is not significant across our additional specifications. Basically, there is some weak evidence that firms employing temporary workers increase their provision of off-the-job-training in order

to protect a core group of workers from demand fluctuations, which is consistent with Hypothesis 1b. Different results emerge from the estimate of the probability to provide on-the-job training adjusted for sample selection bias (Table 4). In all specifications *Ptime* and *Temp* are not significantly related to *Onprop*. The same occurs when using 1-year lagged *Onprop* as dependent variable (Table A.1 in the Appendix).

This result is confirmed by the non-significant effect (ATT) of *Ptime* and *Temp* when they are used as treatment variables in a PSM estimate with the same covariates of the baseline specification of our regression (Table 5 and Table A.2 in the Appendix).

**Table 3. Relationship Between Workforce Characteristics and Off-the-job Training Volumes (OLS estimates)**

	Off-the-job training intensity	Off-the-job training intensity	Off-the-job training intensity	Off-the-job training intensity
P_TIME	-0.142** (0.056)	-0.156*** (0.055)	-0.080** (0.037)	-0.091** (0.036)
TEMP	0.07* (0.052)	0.063 (0.051)	0.038 (0.035)	0.033 (0.034)
IMMIGRANTS	-0.295*** (0.056)	-0.288*** (0.055)	-0.241*** (0.034)	-0.237*** (0.034)
COST_HOUR	-0.789*** (0.054)	-0.779*** (0.053)	-0.790*** (0.035)	-0.786*** (0.035)
SIZE	-0.110*** (0.031)	-0.144*** (0.031)	-0.174*** (0.020)	-0.197*** (0.020)
UNSKIL	0.153* (0.068)	0.126 (0.067)	0.006 (0.037)	-0.014 (0.036)
LAB_COST_HOUR	0.029*** (0.003)	0.028*** (0.003)	0.027*** (0.002)	0.026*** (0.002)
OLD_WORK	-1.307*** (0.283)	-1.287*** (0.279)	-0.895*** (0.184)	-0.882*** (0.182)
YOUNG_WORK	0.104 (0.257)	0.09 (0.254)	0.123 (0.169)	0.119 (0.169)
FEMALES	-0.249* (0.124)	-0.202 (0.122)	-0.309*** (0.081)	-0.289*** (0.081)
INNOVATIVENESS	0.276*** (0.055)	0.210*** (0.055)	0.219*** (0.033)	0.175*** (0.033)
JOB_ROT		0.280*** (0.064)		0.194*** (0.041)
QUAL_CIRC		0.434*** (-0.100)		0.232*** (-0.056)
SELF_LEARN		0.632*** (0.086)		0.529*** (-0.05)
TR_PLAN			0.330*** (0.037)	0.311*** (0.037)
TR_BUDG			0.360*** (0.039)	0.345*** (0.039)
WORK_SAT			0.047** (0.016)	0.039* (0.016)
LEARN_ACH			0.076*** (0.017)	0.066*** (0.016)
WORK_PERF			0.015 (0.016)	0.012 (0.016)
TR_CLAUS			-0.016 (0.037)	-0.019 (0.036)
UN_INV			-0.078* (0.034)	-0.083* (0.034)
CONST	4.559*** (0.222)	4.491*** (0.219)	4.183*** (0.144)	4.205*** (0.142)
Industrial dummies	Yes	Yes	Yes	Yes
N	5986	5986	5986	5986
R2	0.162	0.188	0.242	0.261

The overall sample is restricted to firms that provided off-the-job training in 2005. Training intensity is measured in hours per employee per year (log).

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Table 4. Relationship Between Workforce Characteristics and Firm's Propensity to Provide On-the-job Training (HeckProbit estimates – marginal effects)**

	On-the-job training	On-the-job training	On-the-job training	On-the-job training
P_TIME	0.0128 (0.0245)	0.0065 (0.0245)	0.0167 (0.0244)	0.0085 (0.0245)
TEMP	0.0201 (0.0235)	0.0199 (0.0237)	0.0076 (0.0233)	0.0104 (0.0232)
IMMIGRANTS	0.0215 (0.0242)	0.0196 (0.0244)	0.0255 (0.0237)	0.0234 (0.0237)
COST_HOUR	-0.0362 (0.0230)	-0.0290 (0.0233)	-0.0357 (0.0228)	-0.0300 (0.0230)
SIZE	0.0418** (0.0512)	0.0397* (0.0203)	0.0304 (0.0197)	0.0324 (0.0197)
UNSKIL	0.0455* (0.0260)	0.0257 (0.0267)	0.0367 (0.0264)	0.0210 (0.0266)
LAB_COST_HOUR	-0.0006 (0.0015)	-0.0001 (0.0017)	0.0003 (0.0014)	0.0009 (0.0014)
OLD_WORK	-0.2312 (0.1404)	-0.2146 (0.1431)	-0.2283 (0.1450)	-0.2056 (0.1455)
YOUNG_WORK	-0.0741 (0.3132)	-0.1188 (0.1187)	-0.0554 (0.1191)	-0.0991 (0.1150)
FEMALES	-0.1732*** (0.0589)	-0.1761*** (0.0566)	-0.1714*** (0.0574)	-0.1742*** (0.0555)
INNOVATIVENESS	0.0990*** (0.0286)	0.0729*** (0.0276)	0.0871*** (0.0260)	0.0669*** (0.0251)
JOB_ROT		0.4328*** (0.0301)		0.3933*** (0.0328)
QUAL_CIRC		0.1866*** (0.0411)		0.1429*** (0.0394)
SELF_LEARN		0.1621*** (0.0418)		0.1304*** (0.0408)
TR_PLAN			0.1693*** (0.0243)	0.1482*** (0.0250)
TR_BUDG			-0.0208 (0.0259)	-0.0186 (0.0259)
WORK_SAT			-0.0009 (0.0106)	0.0018 (0.0107)
LEARN_ACH			0.0331*** (0.0109)	0.0276** (0.0113)
WORK_PERF			0.0687*** (0.0108)	0.0557*** (0.0109)
TR_CLAUS			-0.0506* (0.0272)	-0.0543** (0.0276)
UN_INV			0.0008 (0.0242)	-0.0110 (0.0238)
CONST	0.2411 (0.3203)	-0.115 (0.3548)	-0.4013 (0.3531)	-0.6556* (0.3772)
athrho	-0.3920*** (0.146)	-0.2868* (0.1589)	-0.3058** (0.150)	-0.2048 (0.1589)
Industrial dummies	Yes	Yes	Yes	Yes
N	14884	14884	14884	14884
chi2	90.11	317.97	224.13	418.85

The overall sample is restricted to 14,884 observations due to missing data. Uncensored observations are 5,914. Standard errors in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Results are thus consistent with a scenario in which non-standard employment does not penalize the provision of on-the-job training, plausibly because on-the-job training does not require long time to recover its total costs (Hypothesis 2a). On the contrary, we do not find any evidence supporting Hypothesis 2b.

**Table 5. On-the-job Training Propensity Scores of Temporary and Part-time Tiers of the Workforce**

Variable		N	ATT	s.e.	t-stat
TEMP					
	Treated	2400	0.0166	0.0187	0.89
	Controls	3586			
P-TIME					
	Treated	1867	0.0065	0.0216	0.3
	Controls	4119			

Propensity scores are estimated through a logistic function by using a kernel matching algorithm. The function includes the covariates reported in the first specification of Table 4.

To assess the quality of the matching, we estimate the differences between the mean values of a subset of the covariates which are used to match the treatment and control groups (see Table A.3 in the Appendix). Overall, our treatment and comparisons appear to be rather similar after the matching, with no significant statistical differences in the means of the reported values.

## 6 Few Hints about the Possible Effects of the Jobs Act on Flexibility and Training

Our evidence supports the idea that work flexibility differently impacts different types of workplace training. Namely, firms implementing work flexibility practices based on part-time working arrangements negatively affects off-the-job training and does not play a significant role in shaping on-the-job training decisions. This evidence is consistent with the human capital explanation which implies that unstable employment relationships reduce firms' incentives to invest in human capital formation. On the other hand, when work flexibility is implemented through establishing a buffer of non-standard temporary workers within the firms, we find mixed evidence of a positive impact on off-the-job training activities. This evidence is consistent with the flexibility approach explanation, according to which a higher work flexibility allows employers to allocate the most suitable workers to training activities thus expanding participation into such

activities by creating a group of core workers to be protected from demand-side fluctuations by the above said buffer of replaceable workers. However, this evidence is not robust to different specifications compared to the baseline model and further research is needed to assess its scope of validity. We can derive policy implications and hypotheses concerning the impact of the JA reform on the Italian labour market starting from this evidence.

In fact, JA policy goals were substantially two. First, JA aimed at mitigating the dualistic structure of the Italian labour market based on the divide between the employees with open-ended employment contract. Secondly, JA aimed at introducing flexicurity practices in the operation of the Italian labour market. This result can be accomplished only through a mix of complementary interventions on both the system of unemployment benefits and the retraining interventions encompassed within the labour active policies. In addition to a thorough retraining scheme, these policies should feature an efficient labour supply and demand matching system.

As far as work flexibility is concerned, mixed evidence emerges. Truly, the number of open-ended hirings has been rising since the approval of the JA and in the same lapse of time the incidence of self-employment has decreased. However, two counterfactual stylised facts can be observed. First, the contraction of self-employment has started well before the implementation of the JA (OECD, Employment Outlook, various years). Second, the incidence of temporary employment has carried on its steady rise after the enacting of the Jobs Act (OECD, Data Warehouse).

Based on the empirical evidence highlighted in this study, we can postulate that JA impacted differently on on- and off- the job training, further discriminating between firms resorting to different work flexibility strategies in human resource management, i.e., part-time working arrangements, and temporary employment. As both fixed-term and part-time contracts increased following the enactment of JA, this reform may have triggered a double effect on decisions concerning workplace training at a firm level. On the hand, resorting to higher shares of part-timers is suitable to decrease the probability that firm will provide training opportunities to employees because of falling incentives to do so (i.e., falling probability to benefit of returns to human capital investments). On the other hand, a higher share of non-standard temporary workers is suitable to facilitate investments in human capital according to the work flexibility approach explanation. Employers may benefit from work flexibility by efficiently allocating to training activities only the more suitable workers. Which of these two effects prevails is a matter of dispute and further research is needed to disentangle these opposite effects.

## 7 Conclusions

This paper analyses the complex relationship between work flexibility strategies and workplace training at the firm level, thus filling a gap in the relative literature that only takes into account supply-side factors and fails to discriminate between on- and off- the job training. To do this, we use data from a specific survey held by ISTAT prior to the enactment of the JA reform to test whether non-standard working arrangements (usually associated with work flexibility strategies in human resource management policies) differently impact on on- and off- the job training. Unfortunately, the cross-sectional nature of the data does not allow a thorough discussion of possible causal links between the variables of interest by fully addressing the selectivity of training firms. Keeping this limitation in mind, our empirical findings contribute to the existing knowledge on this topic by showing that the relationship between flexible employment and firms' training decisions is markedly heterogeneous across contract types and forms of training. Notably, we find that temporary and part-time contracts perform different functions from the firm's standpoint. Not only this result suggests that flexible contracts play a pivotal role in the process of segmentation of internal labour markets, but also that, in doing so, they may facilitate the processes of skill development in firms. In addition to its well-known role in short-term adjustment of the labour force, each non-standard employment contract carries out its own specific function in the organisation of both work and training in firms.

The empirical evidence does not clarify, however, if the observed relationship between training and flexible contracts arises as a result of the institutional setting or as an outcome of the heterogeneity of training. The implementation of the Jobs Act may be helpful in clarifying this point as it represents a major labour market reforms potentially changing both the insiders/outside divide and, more generally, the room for work flexibility practices. As far as this study is concerned, the implications of our evidence on the post-JA period are mixed. On the one hand, the increase of the share of part-timers following the JA reform may have hampered investments on training as firms lack the incentives (i.e. benefits of returns to human capital investments) to do so. On the other hand, a higher proportion of workers employed with fixed-term contracts may facilitate firms in efficiently allocating training opportunities only to more suitable workers thus leading to a possible increase of either on- and off- the job training. Whether the former or the latter effect prevails is a matter of scrutiny for further applied research, which will hopefully provide valuable policy implications for the debate on future labour market reforms.

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