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Temporary contracts, employees' effort and labour productivity: the evidence for Italy

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Abstract

This paper discusses the thesis (recently pointed out by empirical evidence on Swiss data) that, if temporary contracts are utilised by firms as a tool to screen potential new employees and provide workers with a "stepping stone" into permanent employment, then temporary employees have an incentive to provide more effort than their permanent colleagues.

After a theoretical discussion, the paper focuses on the econometrical analysis of this thesis in an institutional context, like the Italian one, in which permanent workers are rather protected and firms are likely to use temporary contracts mainly to adjust the workforce during the cycle. Data are drawn from ECHP (1996-2001) for Italy and from ISFOL-Plus 2005.

The paper concludes by pointing out that a higher effort does not necessary mean higher labour productivity, and suggests the necessary public policies to improve productivity in labour markets characterised by a growing rate of temporary jobs.

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1. Introduction

This paper links up to the wide literature investigating the incentive effects of contracts and, more generally, employment protection. In particular, I refer to studies evaluating the contract and employment protection effects on the employees' *effort*. This literature originated from some papers based on the hypothesis that sick-pay would provide incentives for opportunistic behaviour. In this framework Barmby et al. (1991), Johannson and Palme (1996, 2002), and Barmby (2002) find a decline in absenteeism after a reduction of sick-pay. Other studies find a strong increase in absenteeism among Italian (Ichino and Riphahn, 2005) and German (Riphahn and Thalmaier, 2001, Ichino and Riphahn, 2004) employees after the end of the probation period. Jimeno and Cortés (1996) find similar results by investigating the effect of low employment protection on absenteeism in Spanish temporary contracts[1].

On the contrary, although temporary contracts are considered less expensive because they avoid inflexibility costs (Bentolila, Bertola, 1990; Bentolila, Saint Paul, 1994; Saint Paul, 2004), some authors have underlined the disadvantages of creating temporary jobs, and the lack of career opportunities attached to them, (Farber, 1999; Arulampalon, Booth, 1998), because they imply a lower effort and lower loyalty on behalf of the workers.

In a recent paper Engellandt and Riphahn (2005), having considered two different effort indicators (unpaid overtime hours and absenteeism for illness and family reasons) taken from the Swiss Labour Force Survey, indicate that temporary employees display higher levels of effort than their permanent colleagues.

The authors point out that in Switzerland, like in the UK and in the USA, employment protection for permanent contracts is rather limited. For this reason it might be less likely in Switzerland, compared to other European countries, that temporary contracts are used to avoid regulation and/or as a buffer against cyclical fluctuations by employers. Then temporary contracts would be used by the firm mainly as a tool to screen the potential workforce and they are likely to provide a "stepping stone" to move into permanent employment. In this case temporary employment can offer access to desirable permanent contracts and temporary employees have an incentive to provide higher levels of effort. Indeed, the hypothesis that temporary workers are likely to provide more effort than permanent ones *if* temporary employment guarantees a good probability of moving on to permanent contracts, is considered in Engellandt and Riphahn's paper, even if it is not submitted to econometric tests.

In this theoretical framework, this paper intends to investigate the Italian experience, in order to identify the differences in comparison with Swiss and Anglo-Saxon ones.

In particular I intend to investigate the relationship between temporary workers' effort and the individual's subjective expectation of converting a current temporary job in a stable one, in the Italian institutional context, in which *permanent workers* ("lavoratori a tempo indeterminato") are highly protected by law and by collective agreements (Booth, Doledo, Frank, 2002) and firms would use temporary contracts

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[1] . It is worth noting that, from a different point of view, Guadalupe (2003) shows that temporary contracts cause significantly higher accident rates.

mainly to adjust the workforce during business cycle phases (Barbieri, Sestito, 2004).

The paper is organized as follows. Section 2 discusses the theoretical bases of the relationship among temporary workers' effort and the probability of getting a permanent contract; section 3 is devoted to the econometric analysis of such an hypothesis; section 4 points out that a higher effort does not necessarily mean higher productivity. Some concluding remarks and policy implications will follow.

2. Hypotheses

A variety of theoretical debates are based on the assumption that workers' effort depends on "motivation" (Ferguson, 2004; Green, McIntosh, 1998). Support for this approach may be also found in the theories on dual labour markets (Doeringer, Piore, 1985; Dickens, Lang, 1985). Such theories sought to distinguish primary labour market, which concerns essentially "permanent" labour contracts, from secondary labour market, which concerns essentially "temporary" contracts. In this case, primary sector jobs would be more "worker friendly", in the sense that they would be more likely to use the "carrot" of high wages than the "stick" of the implicit dismissal threats, embodied in (high levels of monitoring and) temporary contracts. Moreover, under the hypothesis of *effort-based career opportunity*, Bratti and Staffolani (2004) show that firms' personnel management policies can use effort-based *promotion schemes* to raise working time.

Generally speaking we could say that workers would perform a higher effort to improve the "quality" of their jobs. The issue is to define the "quality of job".

Even if this definition has been subject to an increasing debate in Europe[2], the dimension of "precariousness versus stability" is considered of fundamental importance to measure the quality of a job. In particular, precariousness is the first indicator of jobs quality (out of 11) proposed by the European Foundation for the Improvement of Living and Working Conditions (Dhondt, Houtmann, 1997).

The current approach of "job satisfaction economics" (Freeman, 2006) also emphasizes the importance of job security among the working conditions assessing overall job satisfaction. In this theoretical framework, the shifts of the occupational structure may alter job satisfaction and, as a consequence, may alter the motivation and the effort of certain groups of workers who risk to remain precarious employees.

On the other hand, Rodgers (1989) pointed out that *precariousness* is not only connected to *atypical work*, but it is measured through four dimensions:
1. security (continuity of employment – in this light, short/fixed time work is considered *precarious*);
2. working conditions (such as income and working time);
3. protection (such as protection against discrimination and unfair dismissal, but also in the sense of social protection connected to social security benefits);
4. economic vulnerability due to low income jobs.

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[2] . "Jobs quality" is one of the priorities of the European Employment Strategies. Indeed, the European Commission, in the approach presented by Lisbon Council in 1999, emphasises two aims of social policies: the creation of *"more* and *better* jobs".

In any case, most Italian temporary/atypical contracts are characterised by worse working conditions/lower income than permanent ones, and they often do not provide employment protection in case of illness, maternity, etc.. In this case precariousness would coincide with atypical work and it seems possible to conclude that "improving the quality of one's own job" (the "*promotion scheme*") means, for an Italian temporary worker, getting a permanent job.

Indeed, some researches on precarious employment in Europe (see, for example, the results of the comparative international research ESOPE (Frey, Croce, eds., 2002), suggest that the possible higher effort of precarious and temporary workers would be performed to improve monetary and non-monetary working conditions, with special references to transforming temporary work into permanent work within a reasonable period of time.

Coherently with these results, early studies about temporary contracts have been analysed by Booth et al. (2002), who assert that temporary workers' effort depends on the probability of career advancement, measured by the probability of moving on to a permanent contract. More recently Bradley et al., 2007, in a empirical study on a sample of Australian public sector workers, highlighted that the risk of job loss and the possibility of getting a permanent contract have significant and separate effects on temporary workers absenteeism.

Following all these results, in my analysis, I focus on the issue that temporary employees' effort depends on the probability of gaining permanency, rather than the fear of dismissal *per se*.

This hypothesis agrees with Engellandt and Riphahn's point of view, but with some relevant differences.

First of all, Swiss and Anglo-Saxon empirical studies confirm that temporary contracts are used as a "stepping stone" towards permanent contracts, whereas Italian empirical studies can not confirm this. In Italy, the probability of using temporary contracts as a "stepping stone" is low and depends on the allocation of the job, the firm's size, the position held, the labour markets' conditions at local level and the worker's characteristics (Ghignoni, 2007).

Secondly, given that most Italian temporary contracts do not provide social protection, whereas permanent jobs are quite protected (Booth, Doledo, Frank, 2002), employers would use these contracts mainly to adjust the workforce during the business cycle (Barbieri, Sestito, 2004) and they are often being renewed. This highlights further differences between Italy and Switzerland, or Anglo-Saxon countries, where permanent employment protection is, in general, limited and employers are not stimulated to substitute permanent contracts with temporary ones.

For both reasons, we can not state, as Engellandt and Riphahn (*op. cit.*), that workers on temporary contracts have an incentive to provide more effort than permanent colleagues, *because* they perceive temporary contracts as a tool to screen new permanent employees. On the contrary, we have to hypothesize, and test on empirical data, that temporary workers provide more effort *if* (and only if) they perceive a good probability of getting a stable contract.

The empirical analysis carried out in this paper, emphasising the assumption that employees give priority to job security, focuses on the following hypotheses:
1. workers' power bargaining is weaker than the employers' one (because of the existence of unemployment).

2. Temporary workers are interested in being employed by the same firm with a permanent contract, in order to reduce mobility costs and to improve working conditions. For this reason temporary workers show a higher level of effort.
3. Workers are able to balance personal characteristics, working conditions and labour market facets to come up with an overall assessment of the probability of moving into permanent labour contracts. In this case, temporary workers show different levels of effort, depending on local labour markets' conditions, firm size, education, age, gender and other workers' individual characteristics.

3. The empirical analysis

To test the hypotheses that a high level of effort among temporary workers is positively correlated with the probability of moving on to a permanent contract, in the Italian experience, we dispose of two main sources of data: (1) the European Community Household Panel (EUROSTAT, 1996-2001), and (2) the ISFOL-Plus survey carried out in 2005.

In particular, the latter survey, allows utilizing information about the individual's subjective expectation of converting a temporary job into a permanent one. In the absence of such an information (like in ECHP data), I hypothesize that the subjective perception of the probability of moving towards a permanent contract is represented by some probability indicators related to the macro-area where the workplace is located.

3.1 The empirical analysis on ECHP data

The European Community Household Panel is essentially a household longitudinal survey, based on a set of questions concerning individual job characteristics and work experience. The model analyses 6 waves of the ECHP dataset, carried out between 1996 and 2001[3].

The ECHP questionnaire does not include direct questions on effort (as, i.e., "Do you provide paid or unpaid overtime work?"). Alternatively, we have information on real working hours ("Total numbers of hours working per week") that we can compare with hypothetical bargained working hours, that is, 40 hours a week (for full time contracts) or 20 hours a week (for part time contracts).

This way I use the (probability of) "overtime work", that is whether the individual works longer hours than spelled out in a given contract (40 hours if the individual has a full time contract and 20 hours if he has a part time contract), as an effort indicator.

Firstly, I am concerned with whether (or not) the working hours are longer than the contracted ones, especially for temporary workers.

Secondly, I want to explore how the effort differs for groups of workers, defined by personal individual characteristics (such as gender, education, age and specific work experience) and by local labour markets' characteristics. In

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[3] . Due to the absence of PE0024 question (about the type of contract) in the first wave (1994), and to the lack of reliable data on the percentage of temporary contracts by gender and region in 1994 and 1995, I had to exclude these waves from the sample.

particular, I focus on the subjective probability perceived by temporary workers to move to permanent labour contracts.

The simple probability of overtime by type of contract and gender is reported in table 1. The aggregated results confirm the expectation of a higher effort among temporary workers (especially if they do not have a regular contract). On the other hand, men generally seem to provide a higher level of effort than women, no matter the type of contract[4].

To perform a deeper analysis I could estimate the following simple probit model:

$$P_i = \alpha + \beta X_i + \varepsilon_i \quad \text{where:} \quad P_i = \int \begin{matrix} 1 \ in \ case \ of \ overtime \ work \\ 0 \ otherwise \end{matrix} \quad [1]$$

where the set of independent variables X describes personal and socio-economic characteristics of the individuals, and the situation of local labour markets.

However the correlation between hours worked and temporary contracts may be influenced by some unobservable individual characteristics, simultaneously determining working time and the type of contract. In order to mitigate the problem of unobservable heterogeneity I use panel data methods.

Table 1 - Overtime work by type of contract and gender (%)

Overtime work	Permanent contract	Temporary contract	Type of temporary contract			Total
			fixed/short term contract	casual work	Other arrangement	
Males and females						
No	43.09	40.08	42.49	34.94	38.78	42.69
Yes	56.91	59.92	57.51	65.06	61.22	57.31
Pearson chi2(3) = 28.8973 Pr. = 0.000*						
Males						
No	35.61	32.44	35.66	25.43	31.92	35.22
Yes	64.39	67.56	64.34	74.57	68.08	64.78
Pearson chi2(3) = 27.0866 Pr. = 0.000*						
Females						
No	54.82	49.91	51.10	49.87	45.82	54.10
Yes	45.18	50.09	48.90	50.13	54.18	45.90
Pearson chi2(3) = 16.8178 Pr. = 0.001*						

Pearson chi[2] between "permanent contract" and different types of "temporary contracts"
Source: elaborations on Eurostat data

In this context unobserved heterogeneity across individuals may be accounted for by directly modelling it as a random or fixed effect. In any case, if I used fixed effect models it would be necessary to use only the observation for which the value of the dummy P_i in equation [1] changes over time ("movers"). In this case I would exclude from the analysis those individuals who never worked overtime and

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[4] . Coherently with Engellandt and Riphahn (2004), women (on temporary or permanent employment) *ceteris paribus* may provide less effort than men, since men are more likely to seek a career advancement.

those who always did. For this reason I prefer to estimate the following random effect probit model:

$$P_i = \alpha + \delta D_t + \beta X_i + \varepsilon_i \quad \text{where:} \quad P_i = \int_0^{1 \ in \ case \ of \ overtime \ work}_{0 \ otherwise} \qquad [2]$$

in which the independent variables include, among others, a set of yearly dummy variables.

Estimations are performed on a sample including all the individuals in the ECHP waves from 3 to 8 (years 1996-2001) who work with a permanent contract, a temporary contract or a precarious[5] contract.

Table 2 - Random effect probit model: permanent and temporary workers

Random-effects GLS regression   R-sq: within = 0.0251   Obs per group: min = 1
Number of obs = 7679   between = 0.4017   avg = 2.7
Group variable (i): pid   overall = 0.3677   max = 6
Number of groups = 2855

Random effects u_i ~ Gaussian   Wald chi2(24) = 2087.15
Corr(u_i, X) = 0 (assumed)   Prob > chi2 = 0.0000

Variables	Coef.	Std. Err.	Z	P>|z|
1997	0.00565	0.013823	0.41	0.683
1998	-0.0392	0.013952	-2.81	0.005
1999	-0.02651	0.014325	-1.85	0.064
2000	-0.02041	0.014703	-1.39	0.165
2001	-0.00901	0.015139	-0.6	0.552
Age	-0.01225	0.006355	-1.93	0.054
Age squared	0.000126	7.59E-05	1.66	0.098
Females	-0.1916	0.014397	-13.31	0.000
Married	0.012735	0.02075	0.61	0.539
South	-0.11125	0.014047	-7.92	0.000
Bad Health	-0.01771	0.02782	-0.64	0.524
Secondary Education	-0.05685	0.020381	-2.79	0.005
Tertiary Education	-0.00357	0.022835	-0.16	0.876
Small and medium firm	-0.00416	0.011549	-0.36	0.719
Specific Experience	0.000917	0.001042	0.88	0.379
Manufacturing Industries	0.146631	0.01478	9.92	0.000
Elementary occupations	-0.06235	0.018281	-3.41	0.001
Public sector	-0.28977	0.014328	-20.22	0.000
Not overskilled	0.016715	0.010042	1.66	0.096
Not specific training	-0.017	0.010673	-1.59	0.111
Satisfied about working hours	-0.07106	0.009921	-7.16	0.000
Hours spent for children care	-7.1E-05	0.000309	-0.23	0.818
Log(hourly wage)	-0.59815	0.043319	-13.81	0.000
Temporary work	0.079415	0.021772	3.65	0.000
Constant	1.758082	0.136852	12.85	0.000

sigma_u .28211721; sigma_e .28174636; rho .50065769 (fraction of variance due to u_i)
Source: elaborations on Eurostat data

According to the results, reported in table 2, the probability of overtime work is significantly lower for females, for southern workers, for individuals with a secondary level of education (compared to those with a lower level of education),

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[5] . This means, in ECHP, PE024>1. I have 29,486 observations. For a description of data and variables, see Appendix A.

in the Public sector and for people involved in unskilled occupation. On the other hand, people involved in the manufacturing sector seem to have a higher probability of working longer hours than the contracted ones. Moreover the probability of overtime seems to decrease with higher hourly wages[6].

The yearly dummies, which should provide evidence of a higher or lower probability of overwork for each year with respect to 1996 (year of reference), do not show significant results except for 1998. In this year, the probability of overwork was significantly lower in comparison with 1996 (tables 2, 4 and 5).

In any case, temporary workers show a higher probability of doing overtime work. Nevertheless, according to my hypotheses, temporary workers would be more available towards overtime work if they perceive that they have a good probability of entering permanent employment, possibly in the same firm.

To test this hypothesis I re-estimate a random effect probit model on a sample of temporary workers *only*, including an indicator of the probability of getting a permanent contract between the regressors. I use as a *proxi* for this probability the percentage of temporary contracts by region, gender and period of time (table 3), assuming that the higher is this percentage, the lower would be the *subjective* probability of getting a stable job.

Table 3 – Percentage of temporary contracts at regional level, Italy, 1996-2001,

Eurostat macro-areas	Males					
	1996	1997	1998	1999	2000	2001
Valle d'Aosta, Piemonte, Liguria (North West)	3.9%	4.0%	4.8%	5.5%	6.3%	5.6%
Lombardia	4.0%	4.8%	4.9%	4.5%	5.4%	4.7%
Trentino A.Adige, Veneto, Friuli V.Giulia (North East)	5.3%	5.2%	5.6%	7.0%	6.9%	6.1%
Emilia Romagna	5.4%	6.2%	6.6%	6.6%	6.7%	8.1%
Toscana, Umbria, Marche (Centre)	4.6%	5.2%	5.6%	6.1%	7.4%	6.7%
Lazio	4.7%	4.8%	6.3%	7.5%	7.6%	7.3%
Abruzzo, Molise	5.2%	6.4%	7.8%	8.0%	6.9%	7.2%
Campania	8.4%	9.3%	10.2%	11.1%	11.0%	9.2%
Puglia, Basilicata, Calabria (South)	11.4%	12.0%	12.9%	13.3%	14.5%	14.4%
Sicilia	13.5%	13.4%	13.4%	16.4%	17.0%	17.5%
Sardegna	10.4%	13.0%	14.6%	13.8%	14.9%	12.6%
Eurostat macro-areas	Females					
	1996	1997	1998	1999	2000	2001
Valle d'Aosta, Piemonte, Liguria (North West)	6.1%	7.3%	7.9%	9.1%	9.8%	9.9%
Lombardia	6.1%	6.7%	7.4%	8.0%	8.9%	8.5%
Trentino A.Adige, Veneto, Friuli V.Giulia (North East)	9.6%	9.9%	9.6%	11.5%	11.3%	10.6%
Emilia Romagna	8.9%	9.2%	9.7%	10.7%	11.2%	11.8%
Toscana, Umbria, Marche (Centre)	7.9%	8.4%	9.6%	10.7%	11.6%	11.3%
Lazio	6.9%	8.4%	9.1%	10.9%	11.9%	12.0%
Abruzzo, Molise	7.9%	10.8%	11.1%	11.4%	11.7%	12.3%
Campania	10.8%	10.9%	13.2%	14.9%	15.7%	14.7%
Puglia, Basilicata, Calabria (South)	17.1%	16.9%	18.9%	19.7%	20.4%	18.7%
Sicilia	13.5%	14.28%	16.9%	18.3%	18.6%	19.8%
Sardegna	12.8%	12.6%	14.1%	18.2%	19.3%	19.1%

Source: elaborations on Istat data

With regard to this indicator, it is important to stress that I based my empirical analysis on a *subjective* probability and not necessary on an *objective* one. According to my hypothesis workers' effort depends on the *subjective* perception

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[6] . Then, the "income effect" would overcome the "substitution effect".

of improving personal working conditions, apart from the objective situation. The workers offer longer working hours because they convince themselves that they have a good probability of getting a permanent contract in the same firm[7]. In this case, the evolution of the percentage of temporary contracts at local level is the most directly perceivable indicator of labour market conditions for the workers, rather than the temporary/permanent rate of transition[8]. The fact that the workers' expectations may be incorrect, and that the real labour market conditions might be different from those subjectively perceived, is not important in this framework, at least in the short-run[9].

Table 4 - Random effect probit model: temporary workers only

Random-effects GLS regression Number of obs = 703 Group variable (i): pid Number of groups = 457	R-sq: within = 0.0596 between = 0.3059 overall = 0.3114		Obs per group: min = 1 avg = 1.5 max = 6	
Random effects u_i ~ Gaussian Corr(u_i, X)= 0 (assumed)			Wald chi2(25)= 224.2 Prob > chi2 = 0.0000	
Variables	**Coef.**	**Std. Err.**	**z**	**P>|z|**
1997	-0.03486	0.049694	-0.7	0.483
1998	-0.05915	0.054196	-1.09	0.275
1999	-0.08449	0.05684	-1.49	0.137
2000	-0.01826	0.062892	-0.29	0.772
2001	0.011227	0.058709	0.19	0.848
Age	0.008143	0.017526	0.46	0.642
Age squared	-0.00012	0.000217	-0.56	0.573
Females	-0.16251	0.051466	-3.16	0.002
Married	-0.04584	0.056465	-0.81	0.417
South	0.066461	0.066694	1	0.319
Bad Health	0.046376	0.089265	0.52	0.603
Secondary Education	-0.00976	0.066997	-0.15	0.884
Tertiary Education	0.057321	0.070794	0.81	0.418
Small and medium firm	0.011166	0.042593	0.26	0.793
Specific Experience	-0.00016	0.003036	-0.05	0.959
Manufacturing Industries	0.145284	0.059566	2.44	0.015
Elementary occupations	-0.09391	0.042617	-2.2	0.028
Public sector	-0.31107	0.044658	-6.97	0.000
Not overskilled	0.047757	0.03473	1.38	0.169
Not specific training	0.030436	0.044462	0.68	0.494
Satisfied about working hours	-0.06851	0.035432	-1.93	0.053
Hours spent for children care	0.000577	0.001149	0.5	0.616
log(hourly wage)	-0.48646	0.115569	-4.21	0.000
% of temporary contracts	-0.021189	0.004571	-4.79	0.000
number of periods of unemployment	0.00046	0.003124	0.15	0.883
Constant	1.252509	0.368519	3.4	0.001

sigma_u .2830624; sigma_e .31813554; rho .44185912 (fraction of variance due to u_i)
Source: elaborations on Eurostat data

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[7] . and because they "hope" that a higher effort may increase their probability of gaining permanency.

[8] . Then workers would perceive the "danger" of an increasing quota of temporary contracts before of obtaining reliable information about the conversion rate.

[9] . In the long-run, workers could learn from previous wrong expectations and they could base their future expectations on more refined indicators.

Note that, since the probability of overwork may be correlated with the percentage of temporary workers at local level in a specific period, in accordance with the economic cycle, the test could involve endogeneity problems. In periods of expansion, there could be, at the same time, a rise in overwork and a higher rate of temporary workers, whereas in periods of recession, there could be a reduction of both percentages. Then these two variables tend to be correlated and move in the same direction. For this reason, a yearly variable was included in the probit model to take into account the economic cycle of all six waves considered in the estimation, and in this should limit the problem of endogeneity.

Table 5 - Random effect probit model: the influence of the incidence of temporary contracts at local level

Random-effects GLS regression   R-sq: within = 0.0256   Obs per group: min = 1
Number of obs = 7679   between = 0.4015   avg =   2.7
Group variable (i): pid   overall = 0.3666   max = 6
Number of groups   = 2855

Random effects u_i ~ Gaussian   Wald chi2(25) = 2089.4
corr(u_i, X) = 0 (assumed)   Prob > chi2 = 0.0000

Variables	Coef.	Std. Err.	z	P>|z|
1997	0.007796	0.013871	0.56	0.574
1998	-0.03334	0.014328	-2.33	0.020
1999	-0.01253	0.016319	-0.77	0.443
2000	-0.00615	0.016727	-0.37	0.713
2001	0.001998	0.016341	0.12	0.903
Age	-0.01257	0.006358	-1.98	0.048
Age squared	0.000129	0.000076	1.7	0.088
Females	-0.17594	0.01687	-10.43	0.000
Married	0.01247	0.020752	0.6	0.548
South	-0.08415	0.0207	-4.07	0.000
Bad Health	-0.01807	0.027817	-0.65	0.516
Secondary Education	-0.05676	0.020384	-2.78	0.005
Tertiary Education	-0.00323	0.022838	-0.14	0.887
Small and medium firm	-0.00372	0.011552	-0.32	0.747
Specific Experience	0.000898	0.001042	0.86	0.389
Manufacturing Industries	0.14587	0.014785	9.87	0.000
Elementary occupations	-0.06278	0.018281	-3.43	0.001
Public sector	-0.28831	0.014349	-20.09	0.000
Not overskilled	0.017133	0.010044	1.71	0.088
Not specific training	-0.01715	0.010672	-1.61	0.108
Satisfied about working hours	-0.07068	0.009921	-7.12	0.000
Hours spent for children care	-7.9E-05	0.000309	-0.26	0.798
log(hourly wage)	-0.60066	0.043337	-13.86	0.000
Temporary work	0.004084	0.017716	0.23	0.818
% of temporary contracts	-0.219455	0.004569	-4.80	0.000
Constant	1.786634	0.137788	12.97	0.000

sigma_u .28224464; sigma_e .28164951; rho   .50105541   (fraction of variance due to u_i)
Source: elaborations on Eurostat data

To test, more generally, the influence of the overall individual's working history on effort I also include in the regression the number of times the worker had been unemployed after 1989.

The results of this second estimate are reported in table 4.

When I include only temporary workers in the regression, the probability of overtime appears to be lower for female workers, for workers in elementary

occupations and in the Public sector, and higher in the manufacturing sector. This probability appears to be negatively correlated with hourly wages.

According to my hypothesis the percentage of temporary contracts at the local level has a significantly negative impact on the probability of overtime, while the number of periods of unemployment does not seem to affect workers' effort. It is worth noting that, when controlling for the incidence of temporary work at the local level, temporary southern workers do not exhibit a different probability of overwork compared to northern ones (table 4).

To widen the results, I re-estimated the model using the overall sample (with both permanent and temporary workers), including among the regressors the incidence of temporary contracts at local level. In this case (table 5) the influence of the type of contract (temporary or permanent) on the probability of overtime is no longer significant. This could mean that, when controlling for the probability of transition from a temporary job to a permanent one, there would no longer be any significant difference between the effort behaviour of temporary workers and permanent ones. Then, after controlling for the subjective probability of transition, temporary and permanent workers would present the same effort behaviour, even if these two categories of workers bear very different risks of job loss. In this case, the probability of gaining permanency would affect temporary workers effort more than fear of dismissal or non-renewal *per se*.

3.2 The empirical analysis on ISFOL-PLUS data

The Isfol Participation Labour Unemployment Survey is a national sample survey on the individuals' characteristics and the expectations of workers about their working life evolution. In particular, in this survey, various types of temporary workers[10] are asked: "how do you feel about the probability of converting your present temporary job into a permanent one"?. For the purpose of this paper the ISFOL-Plus survey contains some useful information, such as:
1. a series of effort indicators:
   - Do you do any paid or unpaid overtime work?
   - Do you do rotating shifts work?
   - Do you do night shifts (between 10 p.m. and 6 a.m.)?
   - Do you work on statutory holidays and/or during the weekends?
2. Some proxi variables for individual ability, which allow controlling for individual heterogeneity:
   - marks obtained in the different phases of the educational path;
   - regularity of the educational path (tertiary degree of education "in corso", absence of failures during lower and upper secondary education).
3. A subjective assessment of the probability of converting the actual temporary job into a permanent one, as specified above.

In this case we could use some different effort indicators and estimate different probit models, as model [1], keeping into account the individual heterogeneity indicators and the subjective assessment of the probability of becoming a permanent worker.

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[10] . Workers on temporary contracts, Co-Co-Co, Co-Co-Pro, and interim workers.

Really, according to ISFOL-Plus data, temporary workers do not tent to be more inclined towards paid or unpaid overtime work than permanent ones (see table 6.a). Similarly, temporary workers would not be more available to work on the basis of rotating shifts or during nights (see tables 6.b, 6.c) than permanent ones.

Table 6.a - Do you do any paid or unpaid overtime work?

Paid and unpaid overtime work		Type of contract		Total
		Permanent	Temporary	
Males and females	Paid overtime	46.2%	37.3%	45.3%
	Unpaid overtime	10.6%	8.5%	10.4%
	No overtime	43.2%	54.3%	44.2%
Total		100.0%	100.0%	100.0%
Pearson chi2(1)=32.2832 Pr = 0.000				
Males	Paid overtime	51.7%	47.1%	51.4%
	Unpaid overtime	9.5%	8.9%	9.4%
	No overtime	38.8%	43.9%	39.2%
Total		100.0%	100.0%	100.0%
Pearson chi2(1) = 3.5220 Pr = 0.061				
Females	Paid overtime	38.2%	28.6%	37.1%
	Unpaid overtime	12.2%	8.1%	11.8%
	No overtime	49.5%	63.4%	51.1%
Total		100.0%	100.0%	100.0%
Pearson chi2(1) = 27.0227 Pr = 0.000				

Source: elaborations on Isfol Plus data

Table 6.b - Is your job organized on rotating shifts?

		Type of contract		Total
		Permanent	Temporary	
Males and females	Yes	31.5%	29.1%	31.3%
	No	68.5%	70.9%	68.7%
Total		100.0%	100.0%	100.0%
Pearson chi2(1) = 5.2580 Pr = 0.022				
Males	Yes	32.2%	30.4%	32.1%
	No	67.8%	69.6%	67.9%
Total		100.0%	100.0%	100.0%
Pearson chi2(1) = 0.3963 Pr = 0.529				
Females	Yes	30.5%	27.9%	30.2%
	No	69.5%	72.1%	69.8%
Total		100.0%	100.0%	100.0%
Pearson chi2(1) = 6.1789 Pr = 0.013				

Source: elaborations on Isfol Plus data

Table 6.c – Do you do night shifts (between 10 p.m. and 6 a.m.)?

		Type of contract		Total
		Permanent	Temporary	
Males and females	Yes, regularly	8.8%	5.5%	8.5%
	Yes, occasionally	9.1%	7.0%	8.9%
	No, never	82.1%	87.6%	82.6%
Total		100.0%	100.0%	100.0%
Pearson chi2(2) = 11.0233 Pr = 0.004				
Males	Yes, regularly	10.9%	8.1%	10.7%
	Yes, occasionally	12.8%	10.9%	12.7%
	No, never	76.3%	80.9%	76.6%
Total		100.0%	1090.0%	100.0%
Pearson chi2(2) = 5.1163 Pr = 0.077				
Females	Yes, regularly	5.7%	3.1%	5.4%
	Yes, occasionally	3.9%	3.5%	3.8%
	No, never	90.4%	93.4%	90.8%
Total		100.0%	100.0%	100.0%
Pearson chi2(2) = 0.8024 Pr = 0.670				

Source: elaborations on Isfol Plus data

On the contrary, temporary workers are more likely to work on statutory holidays and weekends then stable workers (see table 6.d). Then I choose the latter effort indicator and estimate the following probit model:

$$P_i = \alpha + \beta X_i + \varepsilon_i \quad \text{where:} \quad P_i = \int_0^{1 \; in \; case \; of \; holiday \; work}_{\; 0 \; otherwise} \quad [1]$$

on a sample of temporary and permanent workers.

Table 6.d - Do you work during statutory holidays and/or weekends ?

		Type of contract		Total
		Permanent	**Temporary**	
Males and females	Yes, regularly	26.1%	31.8%	26.6%
	Yes, occasionally	22.8%	21.1%	22.6%
	No, never	**51.2%**	**47.0%**	50.8%
Total		100.0%	100.0%	100.0%
Pearson chi2(2) = 26.8664 Pr = 0.000				
Males	Yes, regularly	25.5%	31.7%	25.9%
	Yes, occasionally	28.0%	24.5%	27.8%
	No, never	**46.5%**	**43.8%**	46.3%
Total		100.0%	100.0%	100.0%
Pearson chi2(2) = 15.5835 Pr = 0.000				
Females	Yes, regularly	26.9%	32.0%	27.5%
	Yes, occasionally	15.3%	18.1%	15.6%
	No, never	**57.8%**	**49.9%**	56.9%
Total		100.0%	100.0%	100.0%
Pearson chi2(2) = 31.2710 Pr = 0.000				

Source: elaborations on Isfol Plus data

As well known, the estimated coefficients of the model are not directly comparable (W.H. Greene, 2003). For this reason it has been decided to transform them in "marginal effects" calculated at the sample mean of the variables. The marginal effects calculated for the binary variables refer to the discrete variation of the dummy variables from 0 to 1.

The results of the estimates, reported in table 7, show that young people, female workers (with children aged 0-12), workers with at least a secondary level of education (if they are not overeducated), people working in small and medium firms and in the manufacturing sector, as well as workers not involved in training activity, exhibit a significantly lower probability of working on holidays. On the contrary southern workers and people employed in unskilled professions are more likely to be involved with holiday work[11].

As noted above (table 6.d), temporary workers show a significantly higher probability of working on holiday and during the weekends than permanent ones.

To shed light on the effort motivation of temporary workers, I re-estimated the model on temporary workers only, considering among the regressors the subjective assessment of the probability of converting the current temporary job into a permanent one (table 8).

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[11] . In the sample there are no workers in the public sector who work on holydays and weekends.

Table 7 – Probit model with marginal effects: temporary and permanent workers

Probit regression	Number of obs = 6562	Marginal effects after probit
LR chi2(22) = 441.32	y = Pr(P_holiday) (predict) = 0.45303931	
Prob > chi2 = 0.0000		
Log likelihood = -4301.3941	Pseudo R2 = 0.0488	

Variables	Coef.	Dy/dx	z	P>|z|
Age	-0.03621	-0.01434	-2.94	0.003
Age squared	0.000384	0.000152	2.51	0.012
Female	-0.11949	-0.04731	-2.90	0.004
Married	-0.06941	-0.02749	-1.69	0.091
Family head	0.072257	0.028652	1.52	0.129
South	0.214136	0.085063	5.89	0.000
Bad Health	0.064778	0.025741	0.52	0.604
Secondary Education	-0.19344	-0.07666	-4.63	0.000
Tertiary Education	-0.46043	-0.1753	-8.04	0.000
Small and medium firms	-0.31527	-0.12525	-5.65	0.000
Specific Experience	0.004783	0.001895	1.93	0.053
Manufacturing Industries	-0.32471	-0.12642	-8.55	0.000
Unskilled professions	0.238666	0.094987	2.50	0.012
Not overskilled	0.250877	0.099391	7.20	0.000
No training	-0.10619	-0.04211	-3.00	0.003
Satisfied about working conditions	-0.27114	-0.10771	-7.32	0.000
Log(hourly wage)	0.073133	0.028974	1.52	0.128
Temporary work	0.136621	0.054318	2.93	0.003
Part time contract	-0.03344	-0.01323	-0.73	0.467
Children 0-12	-0.09713	-0.03859	-2.20	0.028
High Marks	0.00086	0.000341	0.03	0.98
Regular educational path	-0.02282	-0.00905	-0.59	0.554
Constant	-8.53453		-1.72	0.086

Source: elaborations on Isfol-Plus data

The marginal effect of this dummy variable is monotonically increasing along with the improvement of the subjective expectation of becoming a permanent worker. Moreover, temporary workers characterised by a "high" subjective expectation of converting their contract into a stable one exhibit a significantly higher "effort" than temporary workers who consider it "impossible" to get a stable job[12].

As a conclusion, in this section I have sought to quantify the impact of contract status on two different effort indicators (propensity to overwork and holiday work) using two different data sources and two different econometric techniques. The main finding of my empirical analysis appears to be robust to changes in sample and specifications. Indeed, in both cases, temporary workers seems to be more likely to perform through higher levels of effort *if*, and only if, they believe in having a good probability of converting their contract into a permanent one.

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[12] . Note that, when I estimate a model on an overall sample (with both permanent and temporary workers), including among the regressors the subjective assessment of the probability of converting the current temporary job into a permanent one, the dummy variable "temporary job" has been dropped due to collinearity.

Table 8 – Probit model with marginal effects: temporary workers only

Probit regression　　　　　Number of obs　=　1114　　Marginal effects after probit

LR　chi2(24)　　　　=　　y　　=　Pr(P_holiday)　(predict)　=

162.08　　　　　　　　　　　　　　0.53445827

Prob　>　chi2　　　=

0.0000

Log　likelihood　=　-688.79879　　　Pseudo　R2　　=

0.1053

Variables	Coef.	dy/dx	z	P>|z|
Age	-0.01387	-0.00551	-0.43	0.668
Age squared	-6.46E-06	-2.57E-06	-0.01	0.988
Female	0.022968	0.00913	0.25	0.802
Married	-0.0271	-0.01078	-0.21	0.832
Family head	0.024445	0.009708	0.17	0.863
South	0.334317	0.131407	3.90	0.000
Bad Health	0.095579	0.037779	0.23	0.821
Secondary Education	-0.05916	-0.0235	-0.53	0.599
Tertiary Education	-0.54409	-0.21377	-3.57	0.000
Small and medium firms	-0.47547	-0.17976	-2.68	0.007
Specific Experience	-0.01169	-0.00465	-1.02	0.307
Manufacturing Industries	-0.71106	-0.27464	-6.65	0.000
Unskilled professions	0.288958	0.112199	1.44	0.15
Not overskilled	0.449206	0.178538	5.22	0.000
No training	-0.09107	-0.03614	-1.04	0.297
Satisfied about working conditions	-0.28228	-0.11075	-2.93	0.003
log(hourly wage)	0.193988	0.077101	1.78	0.075
Subjective expectation *(impossible)*				
Low	0.0583	0.023144	0.54	0.59
Sufficiently high	0.218343	0.086172	1.98	0.048
High	0.318399	0.124226	2.48	0.013
Part time contract	-0.03376	-0.01343	-0.33	0.744
Children 0-12	-0.19549	-0.07684	-1.33	0.183
High Marks	0.034635	0.013764	0.41	0.684
Regular educational path	-0.02466	-0.00979	-0.25	0.8
Constant	23.74238		1.03	0.302

Source: elaborations on Isfol-Plus data

4. Effort and productivity

Showing that temporary workers display, for a variety of reasons, higher levels of effort than permanent employees, is not sufficient to conclude in favour of the incentive effects of temporary contracts. It would also be necessary to show that such an effort is not only a temporary one, and can produce higher productivity from different points of view.

The concept of *productivity*, indeed, may be defined in different ways (see the discussion introduced by Levitan and Werneke, 1984, pp. 3-4).

From the worker's point of view, productivity can be defined as the "*effort*" made in the production processes during a given period of time. From the manager's point of view, productivity may be defined in terms of *quantity of production* obtained by a labour unit in a given period of time. From the entrepreneur's point of view, productivity can be defined in terms of *profits* obtained during a given period of time. From the consumer's point of view, productivity can be defined in terms of the *quality and prices* of goods and services.

It is clearly pointed out by the econometric analysis carried out in this paper that, under certain conditions, workers are induced to a higher "effort" if they are employed on a temporary basis, i.e. they supply more (paid or unpaid) working hours, or they are more inclined to work on holidays or during the weekends.

However, on the one hand, this does not imply that they exploit working time more intensively. In other words, a higher "effort" does not necessarily mean a higher quantity of production by unit of labour input. In this case the higher effort of temporary workers does not help in understanding the impact of temporary employment on labour productivity from the managers and entrepreneurs' point of view, which remain unclear and to be demonstrated[13]. On the contrary we could assume that a unit of labour performed by a temporary worker risks producing a lower result than a unit of labour performed by a permanent worker with a long *experience* in the productive process.

On the other hand, even if a harder effort would automatically imply a higher level of productivity (from the point of view of the manager and the entrepreneur), if the higher effort of temporary workers were performed to improve the probability of transforming temporary work into permanent work within a reasonable period of time, being unsuccessful in this aim could discourage workers, leading towards a reduction of such an effort. In other words, if we accept the hypothesis that the higher effort of temporary workers depends on expected opportunities of getting a permanent contract, we have to conclude that such an effort would decrease/disappear if expectations worsen.

For these reasons, temporary workers' higher effort could produce positive effects on labour productivity only in the short-run (if any), and negative ones in a longer period of time, because of the discouraging consequences of employment precariousness on workers' behaviour.

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[13] . It was observed (see Levitan, Werneke, 1984, p. 4) that "if a worker's effort was a satisfactory indicator of labour productivity, the Egyptian Pyramids would be the most productive organizational structure in man's experience".

In this case, if the current increase of temporary employment were perceived as an increase in precariousness, the effects of temporary contracts on the workers' effort and labour productivity would be temporary and uncertain.

Moreover, researches carried out in the United Kingdom and USA (Taylor, 2003), on the one hand, reinforce the importance of internal labour flexibility (flexible organizational arrangements and new management techniques) to promote innovation and competitiveness, but, on the other hand, show that the external labour flexibility (atypical labour contracts and lighter regulation framework) risks to create contingent workers with temporary contracts not compatible with the creation of workplaces that enhance performance and labour *productivity*, in the sense of quantity and quality of goods and services produced by a unit of labour input. These researches point out that the abuse of temporary workers risks to create a barrier to competitiveness, because higher performance workplaces are based on the creation of stable and better-motivated workforces, in a fully integrated working environment that promotes skills and innovation. Indeed, temporary labour contracts provide, in general, less human capital accumulation than permanent ones (Albert, Garcìa-Serrano, Hernanz, 2005; Arulampalan, Booth, 1998). This lack of human capital accumulation involves both non formal and informal learning: on the one hand, enterprises are not motivated to invest in training because the tenure of the contract is not long enough to guarantee an adequate return of investment; on the other hand, the short tenure of the contract provides a lower level of informal learning acquired on-the-job rather than that connected to a permanent job. In this context (as asserted by Dornbusch, Fischer and Samuelson, 1977), it could be better to reply to globalisation exploiting a comparative advantage founded on a knowledge-based economic activity.

In general, microeconomic researches carried out in Italy show that some aspects of labour flexibility can have positive effects on innovations and labour productivity (see Zanetti, 2000). However, if the labour flexibility is accompanied by employment precariousness, the long-term effects on labour productivity seem to be normally negative (Frey, Croce, eds., 2002; Frey, Pappadà, eds., 2004).

In this framework, the Eurostat data show an apparently negative relationship between the incidence of temporary work on total employment and the trend of labour productivity per man/hour. In particular, data reported in table 9 and in table 10 suggest that in European countries we can find very different types of experiences.

The Spanish experience presents the maximum incidence of temporary work over the last ten years. However Spain has recently tried to overcome job precariousness by law, introducing a rule that prevents firms from filling the same vacancy for more than 3 years with one, or several, temporary workers (Güell, Petrongolo, 2003). The French experience is similar to the Spanish one in terms of incidence of temporary employment and attitude of labour policies, because recently, it has re-considered the economic and social consequences of temporary work and cancelled new forms of temporary contracts under the pressure of trade unions and workers' mobilization.

Both experiences show a decreasing incidence of temporary employment (on total employment) and erratic productivity per hour worked over the last few years.

The British and German experiences show better productivity performances in the years in which the incidence of temporary employment was much less than the

average in the EU. In any case the British experience shows much more voluntary part-time work than temporary work, probably with less negative consequences for the workers involved, and in Germany temporary work is mainly concentrated within the apprenticeship system and it appears to be a step towards less precarious forms of employment.

Table 9 – Productivity per hour worked in some European Countries, from 1995 to 2003 (annual percentage growth)

Countries	1995	1996	1997	1998	1999	2000	2001	2002	2003
European Union 15	*2.0*	*1.2*	*1.7*	*1.5*	*1.6*	*2.5*	*1.0*	*0.6*	*0.8*
Denmark	4.4	1.9	1.3	1	-1.3	4.9	0.5	2.5	
Germany	2.5	2.3	2	1.3	1.5	2.2	1.4	1.3	0.8
Spain	0.9	1.4	0.9	-0.7	1.7	0.8	0.4	1.1	
France	2.3	0.4	1.9	2.6	1.6	4.4	1.8	0.3	2.8
Ireland	5.7	4.2	7.7	4.2	6.8	5.3	3.9	6.1	
Italy	3	0.3	1.5	0.9	0.9	1.3	0.5	-1.4	
Netherlands	2.3	0.1	1.1	2.9	2.7	-0.5	2.7	-1.6	
Austria	1.6	2.6	-1.9	9.1	0.6				
Portugal	3	3.1	4.6	2.8	1.1	3.7			
Finland	1.5	2	3.3	3.1	0.7	3.2	0.4	1.9	0.9
Sweden	2.1	1.6	3.5	2.2	1.8	3.3	0.4	3.3	3
United Kingdom	1.8	1.2	1.5	2.2	2	3.1	1.2	1.2	

Source: European Commission, Employment in Europe 2004, pp. 229 and f., Office of Official Publication, Luxembourg, August 2004.

Table 10 – Incidence of fixed-term employment on total employment in some European Countries, from 1995 to 2003 (percentages)

Countries	1995	1996	1997	1998	1999	2000	2001	2002	2003
European Union 15	*12.0*	*12.3*	*12.7*	*13.1*	*13.4*	*13.6*	*13.3*	*13.0*	*12.8*
Denmark	11.6	10.9	10.6	9.9	9.6	9.7	9.2	9.1	9.3
Germany	10.5	11.2	11.8	12.4	13	12.7	12.4	12.1	12.2
Spain	35.2	34.1	33.8	33.2	32.9	32	31.7	31	30.6
France	12.4	12.8	13.4	13.9	14.5	15.2	14.6	13.5	12.9
Ireland	10	9.3	9	7.2	5.2	5.7	5.2	5.3	5.1
Italy	7.4	7.4	7.9	8.6	9.5	10.1	9.8	9.9	9.9
Netherlands	11.4	12.3	11.8	13	12.3	13.7	14.3	14.4	14.6
Austria	6.8	7.8	7.9	7.8	7.9	8	7.8	7.3	7.1
Portugal	12	13.6	15.4	17.2	18.7	19.9	20.4	21.7	21.1
Finland	11.6	11.4	10.9	11.4	12.1	12.3	12.2	12.8	13
Sweden	14.7	14.4	15.1	16.1	16.5	15.8	15.2	15.2	15.1
United Kingdom	7.2	7.3	7.6	7.3	7	6.9	6.7	6.3	6.1

Source: European Commission, DG5, Employment in Europe, 2003-2004, Statistical annexes, Luxembourg, European Community Office for the Publications.

The Italian experience shows a relatively high and growing incidence of temporary employment, with prevalent negative consequences for the workers involved, and a very negative performance of productivity per hour worked over the last ten years.

Moreover, the Irish case shows the highest percentage growth of productivity per hour worked in the EU15 and a strong decrease in the incidence of fixed-term contracts. In 2003 Ireland was characterised by the lowest percentage of temporary work on total employment in the EU15. On the contrary, Scandinavian countries seem to conjugate a relatively high and globally stable quota of fixed-term contracts with an acceptable evolution of productivity. In this context, the case of the Netherlands represents a remarkable exception. Dutch labour markets, in fact,

have been characterised by a negative evolution of productivity and by an increase in temporary employment.

Considering all this information, we cannot exclude that active labour policies, contributing to a reduction of the incidence of temporary employment, can positively affect the working and living conditions of Italian employees and the productivity performances of the Italian economic system, at least in the long run.

4. Concluding remarks

The global approach of this paper is based on the assumption that temporary workers are interested in making a higher effort than permanent workers *only* if they perceive that this effort may provide a "stepping stone" towards typical labour contracts.

The empirical test of such a hypothesis was based on the European Community Household Panel and on the Isfol-Plus data. In particular, in the case of ECHP data, in which there is no information about the subjective assessment of the probability of converting the current temporary job into a permanent one, I assumed that the proportion of temporary contracts in the region where the worker lives can be considered an easily observable indicator of such a probability. The lower the proportion of temporary workers in the region, the higher would be the subjective probability perceived by temporary workers of gaining permanency, and the higher would be the effort of such workers.

The statistical and econometric tests presented in the third section support the hypothesis that a higher proportion of temporary employees at regional level, or in any case, a bad subjective expectation about the probability of getting a stable contract, discourages atypical workers from producing a high level of effort.

Anyhow, we can not rule out the possibility that temporary workers' higher efforts do not last in the medium-long term. Indeed, on the one hand, if they perceive a low probability of transforming their contracts into permanent ones, they would reduce their level of effort and, on the other hand, we can not exclude that ex-temporary workers would not have the incentive to operate with a high level of effort after being confirmed on a stable basis (Engellandt, Riphahn, 2005). In the latter situation it would be more convenient for firms to keep the quota of temporary workers constant over time, in an attempt to gain the workers' higher levels of effort. This way, however, firms could signal a low probability of access to permanent jobs for temporary workers, with negative results in terms of effort[14].

Moreover, the eventually higher effort, in terms of working hours, given by temporary workers, does not necessarily mean higher labour productivity. The European data discussed in the fourth section, indeed, show an apparently negative relationship between the incidence of temporary work on total employment and the trend of labour productivity per man/hour. In particular, the Italian experience presents a growing incidence of temporary employment, along with worse productivity performance, in terms of productivity per man/hour, than countries with a decreasing incidence of temporary employment.

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[14] . In the Italian institutional context it is not even believable that a high stock of temporary workers would operate as a modern "industrial reserve army", which would be a deterrent for the effort of permanent employees.

Considering the information collected and discussed in this paper, we can argue that policies directed to contain/reduce the incidence of temporary contracts on total employment could have positive effects on (long run) labour productivity, in addition to better working and living conditions for the workers involved and their families.

The Danish and Dutch experiences can provide useful suggestions about which kind of policies can be pursued, mainly in the direction of flex-security of employment.

Policy makers should focus more on high-skill solutions than on short-term contracts, stimulating firms to consider this approach. This way they would launch the approach "skills and innovation"[15], in a production system that is still anchored to low-skill methods, and would reduce the risk of vicious circles based on low-value added and low-skills, leading towards a "low skill, bad job trap" (Snower, 1996).

In Scandinavian countries, industrial and employment policies are integrated (Taylor, 2003), providing high performance workplaces. Even if it is not easy to adapt such policies in a country like Italy, which is very different from the Scandinavian socio-economic system, it would be important to implement an integrated package of policies aiming to innovate (new technologies, new organizational methods, new products), create a high-skill workplace (opportunity of lifelong learning for all, that is, education, training and informal learning for everyone at any age) and create a high quality of working conditions and working life. This recipe might probably improve the 21st century globalized labour market.

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[15] A process of integration between skills and innovation production. An organization can not produce innovation without producing skills and vice-versa.

Appendix A - Eurostat data and variables description

The data used for the estimations presented in section 3.1 are obtained from the 3rd to 8th waves (1996-2001) of the European Community Household Panel (ECHP-Eurostat) for the case of Italy. For the purpose of this analysis the individuals included in the sample have been selected so as to include employed people, with a permanent contract, with a temporary contract or without any contract (29,486 observations).

In the ECHP survey the main question on "precariousness" is PE0024 (applicable only for dependent employment): "What type of employment contract do you have in your main job?" Respondents are asked to select the type of contract among the following categories: Permanent employment; Fixed-term or short term contract; Casual work with no contract; Some other working arrangement.In this case we could consider category 2 and category 3 "temporary/precarious jobs", (category 4 includes only few observations and I dropped them from the analysis).

Some of the variables included in the estimates are described below.

Table A1 – Sample means for the set of regressors

Variable	Obs	Mean	Std. Dev.	Min	Max
Probability of overwork	29486	0.573086	0.494638	0	1
1996	29486	0.1875	0.390312	0	1
1997	29486	0.173	0.378247	0	1
1998	29486	0.169	0.374752	0	1
1999	29476	0.1646	0.370819	0	1
2000	29486	0.158	0.364741	0	1
2001	29476	0.1478	0.354902	0	1
Age	29486	38.75076	10.55622	15	64
Age squared	29486	1613.052	852.1881	225	4096
Females	29486	0.395679	0.489004	0	1
Married	29476	0.676822	0.467698	0	1
South	29239	0.401211	0.490152	0	1
Bad Health	29457	0.029059	0.167976	0	1
Secondary Education	29197	0.467925	0.498979	0	1
Tertiary Education	29197	0.41083	0.491993	0	1
Small and medium firm	26639	0.359135	0.479756	0	1
Specific Experience	26429	10.06818	7.497709	0	22
Manufacturing Industries	29486	0.233569	0.423108	0	1
Elementary occupations	29486	0.102015	0.302673	0	1
Public sector	28412	0.367978	0.482264	0	1
Not overskilled	28381	0.516508	0.499736	0	1
Not specific training	29472	0.650075	0.476954	0	1
Satisfied about working hours	29371	0.681114	0.466053	0	1
Hours spent for children care	9840	26.85528	16.74557	1	70
log(hourly wage)	28871	1.045119	0.16685	0.31607	1.953839
Temporary work	29486	0.133012	0.339594	0	1
% of temporary contracts	29486	9.620383	4.381988	3.9	20.4
Unemployed before, yes/not	18541	1.463999	0.498716	1	2
Number of periods of unemployment	29486	2.25144	4.638551	0	96
Part-time contracts	29486	0.806756	1.576503	1	2

Probability of overwork (dependent variable): binary variable built on questions PE005 (*Total number of hours worked per week*) and PE005C (*Full time/part time contract*). This variable is equal to 1 if the individual works more than 40 hours a week (with a full time contract) or more than 20 hours a week (with a part-time contract); otherwise the variable is equal to 0.

Specific Experience: variable built on the basis of the question PE011 as follows:

Specific experience = year of the survey - starting year of current job

Elementary occupation: dummy variable built on question PE006c (*Occupation in current job, i.e. principal activity performed*), Elementary occupations = 1; others = 0 (legislators, senior officials and managers, professionals, technicians and associate professionals, clerks, service workers and shop and market sales workers, skilled agricultural and fishery workers, craft and related trades workers, plant and machine operators and assemblers, armed forces).

Not overskilled: dummy variable built on question PE016 (*Do you feel that you have skills or qualifications to do a more demanding job than the one you have now?*); no=1, yes=0.

Not specific training: dummy variable built on question PE021 (*Have you had formal training or education that has given you skills needed for your present type of work?*); no=1, yes=0.

Satisfied about working hours: dummy variable built on question PE034 (*How satisfied are you with your present job in terms of number of working hours?*), 1 = not satisfied….. 6 = fully satisfied; 1,2,3 = 0; 4,5,6 = 1.

Log(hourly wage): variable built on the basis of question PI211M (*Current wage and salary earnings, net-monthly*) and of question PE005 (*Total number of hours worked per week*). This information has also been utilised for the definition of "overtime" work.

% of temporary contracts: percentage of temporary contracts over the total dependent employment by year, gender and Eurostat region; CNEL elaborations on ISTAT data.

Appendix B - Isfol-PLUS data and variables description

The data used for the estimations of section 3.2 are drawn from Isfol-PLUS, 2005. This survey contains information on the characteristic of 40,386 individuals, selected according to their status of participation to the labour market. The operational sample includes only dependent employees with a permanent or a temporary contract (13,891 individuals).The dependent variable is the probability of holiday work.
Concerning the definition of the variables, see description below.

Table B1- Sample means for the set of regressors

Variable	Obs.	Mean	Std. Dev.	Min	Max
P_holyday	12736	0.482412	0.49971	0	1
Age	13891	39.39608	12.52159	15	64
Age squared	13891	1708.83	1007.731	225	4096
Female	13891	0.534303	0.49884	0	1
Married	13891	0.565906	0.495655	0	1
Head of family	13891	0.416241	0.492952	0	1
South	13891	0.333525	0.471489	0	1
Bad health	13891	0.020805	0.142736	0	1
Secondary education	13891	0.540422	0.498381	0	1
Tertiary education	13891	0.257289	0.437156	0	1
Little and medium firms	8404	0.916825	0.276163	0	1
Specific experience	13891	12.139	11.17229	0	50
Manufacturing indistries	13891	0.144914	0.352027	0	1
Not qualified professions	13891	0.030595	0.172225	0	1
Not overskilled	13891	0.42128	0.493782	0	1
No training	13891	0.521777	0.499544	0	1
Satisfied about working conditions	13751	0.747	0.434747	0	1
Log (hourly wage)	12736	1.949799	0.395688	0.29	4.39
Temporary contract	13891	0.224174	0.417052	0	1
Subjective expectation about the probability of convertion:					
High	2585	0.171	0.376509	0	1
Sufficiently high	2585	0.2538	0.435185	0	1
Low	2585	0.3327	0.47118	0	1
Impossiblempossibile	2585	0.2426	0.428655	0	1
Part time contract	12736	0.156564	0.363404	0	1
Children 0-12	13891	0.790152	0.407215	0	1
High Marks	12370	0.554083	0.497087	0	1
Regular educational path	13530	0.766962	0.422782	0	1

Probability of working on holidays/weekends (dependent variable): binary variable which takes value 1 if the answer to question V570 is "yes" and value 0 otherwise.

Specific Experience: number of years of work within current job, built on the basis of question V460_1 as follows:

Specific experience = 2005 - starting year of current job

Unskilled professions: dummy variable built on question PROF9 (*Profession*), Unskilled professions = 1; others = 0 (legislators, senior officials and managers, professionals, technicians, clerks, qualified workers in service and sales sectors, craftsmen, skilled workers and agricultural workers, plant and machine operators and assemblers, armed forces).

Not overskilled: dummy variable built on question VF430_1 (*Is your educational level necessary to do your current job?*); yes=1; no=0.

No training: dummy variable built on question V1750 (*Have you been involved in training or education during the last 3 years?*); no = 1, yes =0.

Log(hourly wage): variable built on the basis of question V658 (*net-monthly wage*) and of question V230_1 – V230_3 (*Working hour*).

Temporary contract: dummy variable built on question V110_2 (*What type of employment contract do you have in your current job?*); temporary =1, permanent=0.

Subjective expectation: dummy variables built on questions V280, V340, V380 (*How do you feel about the probability of converting your current temporary contract into a permanent one?*); high=1, sufficiently high=2, low=3, impossible=4 (ref. category).

High Marks: dummy variable built on question V890 (lower secondary education; medium-high =1, medium-low = 0); on question V892 (upper secondary education; from 60/60 to 48/60, or from 100/100 to 80/100, = 1, from 47/60 to 36/60, or from 79/100 to 60/100, = 0); and on question V898 (tertiary education; from 100 cum laude to 99 = 1, from 98 to 66 = 0).

Regular educational path: dummy variable built on question V910 (tertiary education; tertiary education degree "in corso" or "fuori corso" within 3 years = 1; "fuori corso" longer than 3 years = 0); and on question V920 (lower and upper secondary education; no failure = 1; one, two or more failures = 0).

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