

# Determinants of labour effort and the role of contract

Massimo Mancini\*

Draft, September 2009

## Abstract

The aim of this study is to examine the determinants of worker effort and to investigate the incentive role played by different contractual arrangements. The hypothesis to be tested is that the probability of exerting effort is higher for temporary workers than for permanent ones, using indicators known in literature (unpaid overtime hours and absenteeism for illness and family reasons). Data are taken from Italian Labour Force Survey. The results show that temporary workers provide more effort only with regard to absence, but not with regard to unpaid overtime work.

## 1 Introduction

This paper deals with the determinants of labour effort and investigates the incentive role played by different contractual arrangements. It was observed [5], that in the theoretical literature it's difficult to find a definition of effort. In Efficiency Wage models [8] effort is defined in relation to shirking (which is described as the provision of "minimal effort"). It depends positively on wages and could be an outcome of this family of models. [5]. Effort can be also estimated from a production function [7])<sup>1</sup>. Since labour utilization is a characteristic of business fluctuations, it could depend both on firm's decisions and on worker behaviour. According to this view, worker effort represents the unobserved labour utilization.

Effort is a key element of worker behaviour but its definition is essentially empirical and may vary depending on the scope of the research. There is evidence that the characteristics of employment contract may affect worker's effort. First of all, there is an evidence of a relation between sick-pay regulation and worker's effort in the form of increased absenteeism: Barmby et al.[9] find that the firm's sick-pay scheme works most effectively on the duration of the absence, while [2] find a decline in absenteeism after a reduction of sick-pay <sup>2</sup>.

---

\*ISAE, Rome, email: m.mancini@isae.it

<sup>1</sup>this paper pointed out that the elasticity of effort could be decreasing at the rising of hours worked (due to the higher fatigue exerted by the worker).

<sup>2</sup>see also [14]

Besides, some studies pointed out an increase in the number of absence among Italian and German employees after the end of a probation period without job security<sup>3</sup>. Ichino and Riphon (2004) [10], show that the number of days of absence per week doubles once employment protection is granted. This literature shows that probationary periods may induce self-selection of those workers with more ability because they have a higher probability to obtain permanent contract. Firms view the initial fixed-term contracts as a probationary stage. Consequently, the temporary worker may be induced to act (mimic) as "a good worker" -exerting more effort than he would have done in case of stronger job security - in order to obtain the prosecution of the contract [13]. So firms may use temporary contract as a screening mechanism, similarly to what happens, for example, in case of contract with Rank Order Tournaments [12]. A paper by Engellandt and Riphon [4] present evidence that temporary employees display higher levels of effort than permanent workers having considered two different effort indicators (unpaid overtime hours and absenteeism for illness and family reasons), taken from Swiss labour force survey. Ghignoni (2007) [3] utilizes similar indicators for the Italian case (paid and unpaid overtime work), using European Community Household Panel (EHCP) data to show that temporary workers exert more effort only if they perceived a high probability on the getting a permanent contract<sup>4</sup>. The aim of this work is to examine the determinants of worker effort and the role played by the type of contract with a focus on the Italian case: the hypothesis to be tested is that the probability of exerting effort is systematically higher for temporary workers rather for permanent ones. This work is based on the indicators utilized by Engellandt and Riphon. The data of the analysis are taken from the Italian Labour Force Survey which is a relatively rich dataset and made up of a great number of control variables. The next section will provide a very brief background on temporary work in Italy and on the principal characteristics of temporary workers in Italy. This representation will allow to start debating on the empirical strategy and the estimates. Section 3 deals with the empirical strategy while section 4 present the result.

## 2 Temporary work in Italy

The Italian labour market is often described as deeply segmented between an insider and an outsider market. As other European countries, Italy is characterized by "flexibility at the margin", which combines a high degree of employment protection in the regular segment (a strict firing regulation applying to permanent workers), with a relatively high degree of flexibility, in the use of temporary contract. This situation is due to the way flexibility has been introduced in the country since 1990<sup>5</sup>: Italy has removed law obstacles to the use of temporary

---

<sup>3</sup>see [13], 2001, [10], 2004, [11]

<sup>4</sup>this probability is represented by some probability indicators related to the macro-area where the workplace is located.

<sup>5</sup>see Barbieri, p.131 [1] for a contractual arrangement description

work (fixed term contract, temporary help agency work and other forms of temporary work) while maintaining the same regulation for permanent workers). Moreover, as happens in other European countries, young people usually enter the labour market with a temporary contract. Table 1 describes the share of temporary workers on the total of employees. Temporary work is spread very differently among groups of individuals and some categories are overrepresented. The share is actually quite higher for the younger until 35 years of age and for women. Temporary contract is also most important in the south of the country and in the agricultural sector.

### 3 Data and empirical strategy

The data used in this study comes from the Italian Labour Force Survey (LFS). This survey, provides, on quarterly basis, a rich dataset with many observations (about 200.000 individuals every wave) and contains a wide set of control variables on personal information (gender age education marital status among others) and "work features" (e.g. the type of contract, sector and occupation). Unfortunately, there are neither wage data, nor measures of job satisfaction (which could be related to effort). To examine the determinant of effort and to investigate the incentive role of temporary contract, two indicators are used [4]<sup>6</sup>. The first one measures if the worker has provided unpaid overtime hours [4]. This indicator is taken from two questions asked in the survey: first the respondents are asked whether in the week prior to the survey they have provided overtime hours. Second the respondent is asked if the overtime hours were remunerated. The second describes if the worker was absent the entire week prior to the survey [4],[10], [13]. The hypothesis to test is whether workers in temporary contract exert more effort compared to those who are in permanent positions. Both the effort indicators used are binary variables and the hypothesis is tested by regressing the effort outcomes on an indicator of temporary employment and a set of control variables in a logit model. Since I don't have panel data, in order to test the robustness of results, the model is estimated on the cross section along all the quarters of a year <sup>7</sup>.

### 4 Results

The estimation results for the effort indicators (overtime and absence) are reported in tables 2 and 3 for all quarters of the year 2007. The evidence shows that the unpaid hours indicator (table 2) seems to be not influenced by the type of contract: individuals in temporary jobs does not appear significantly more

---

<sup>6</sup>these are "indirect" proxies of effort; an alternative approach to measure it is "self measured effort" obtained asking directly to the worker its level of effort.

<sup>7</sup>The Italian labour force has a "rotating panel" structure in which every individual is interviewed for two subsequent quarters and then after one year. However given that, it's possible to have only 25 percent of the sample panel that could be affected by serious attrition problem.

likely to work unpaid hours than those on permanent positions. This outcome appears to be robust for each quarter estimate. Other results show that the propensity for doing unpaid work hours is higher for males, increases with age and education, is more widespread in the North East of the country and for Italian nationals. Also the probability of working overtime varies significantly across sector and occupation and for those who have coordination duties in their job. Moreover, overtime work seems to be influenced by the worker's familiar status: married individuals tend to work overtime less than those who are in a single condition (but this result does not seem to be robust). However the temporary job indicator appears significant until the author controlled for the family position of the individual (head of the family, son etc.). This is probably related to the evidence that the distribution of temporary jobs is particularly widespread on certain groups (see section 2). In contrast to previous results the absence indicator is clearly significant: the negative coefficient shows that individuals in temporary work have a lower absence probability than workers in permanent positions. The results are confirmed for all the models presented. The results (ii quarter) suggest that if the worker is on temporary contract the probability of being absent from work is 0.14 lower than a permanent worker, holding other variables at their mean<sup>8</sup>. The results are confirmed for all estimates presented. Other results show that the absence probability is higher for women, decrease with age and education and is lower in the southern regions and for non-nationals. Also, the probability of being absent from work varies across sector and lower for those who are involved in coordination duties in their job. Moreover it's clearly influenced by the worker's marital status: those who are at head of the family are significantly to be absent from work than their sons. This results seems consistent with that of Ichino and Ripahn (2004)[10]. A potentially important issue concerns the possible endogeneity of the temporary contract indicator [4]. Here, endogeneity may arise because individuals in temporary contract could be a selection from the population (they may be not a random "sample" of the population itself). Here estimates may be affected by a selection problem. As explained in section 2<sup>9</sup>, Italy is a segmented labour market and some groups (e.g. young people) are over represented in temporary jobs. In such a situation, to be in a temporary position presumably reflects being in a certain group of individuals. In other words, the probability to be a temporary worker may be related to observable characteristics of the individual (like age, geographical area etc.), rather than unobservable factors like motivation or ability. Here, given the detailed control for demographic and job characteristics and human capital in the regressions, it's unlikely that estimate may be biased. To support the hypothesis of absence of systematic differences between temporary and permanent workers tables n. 5 and 6 presents some statistical evidence. I found that considering small age groups, differences among the averages of the main observed workers' features are not significantly different from zero for most of the sample except for males belonging with the central

---

<sup>8</sup>The reference estimation is however the II quarter, probably the one with less seasonality effect.

<sup>9</sup>see also[1].

age group (i.e. the strongest segment in the labour market).

## 5 Conclusions

The aim of this study is to examine the determinants of worker effort and to investigate the incentive role played by different contractual arrangements. The hypothesis to be tested is that the probability of exerting effort is higher for temporary workers than for permanent ones, using as unpaid overtime hours and absenteeism for illness and family reasons [10][4]. Data comes from Italian Labour Force Survey. The results show that temporary workers provide more effort only with regard to absence, but not with regard to unpaid overtime work.

## References

- [1] Barbieri Gianna & Sestito Paolo (2008), Temporary Workers in Italy: Who Are They and Where They End Up *Labour* vol. 22(1), 127-166.
- [2] Barmby T.A. (2002) Worker Absenteeism: a Discrete Hazard Model with Bivariate Heterogeneity, *Labour Economics*, Elsevier Vol. 9(4), pp.469-476.
- [3] Ghignoni E. (2008). Temporary contracts, employees' effort and labour productivity: the evidence for Italy *Working paper University of Rome 'la Sapienza'*,
- [4] Engellandt, Axel & Riphahn, Regina T. (2005). Temporary contracts and employee effort, *Labour Economics*, Elsevier, vol. 12(3),281-299.
- [5] Green F. & McIntosh S. (1998), Union power, the cost of Job Loss, and Workers' Effort, *Industrial and Labor Relations Review*, July, 363-383.
- [6] Ichino, Andrea & Riphahn, Regina T. (2001). The effect of employment protection of worker effort, *Labour Economics*, Elsevier, vol. 12(3),281-299.
- [7] Marchetti, Domenico J. & Nucci, Francesco. (2001). Labour effort over the business cycle, *Temi di discussione (Economic working papers)*, 424, Bank of Italy, Economic Research Department.
- [8] Shapiro, Carl & Stiglitz, Joseph E. (1985). Equilibrium Unemployment as a Worker Discipline Device, *American Economic Review*, vol. 74(3), 433-44.

- [9] Barmby, T. A. & Orme, C. D. & Treble, John G, (1991). Worker Absenteeism: An Analysis Using Microdata, *Economic Journal*, Royal Economic Society, vol. 101, 214-29.
- [10] Ichino A & Riphahn R.T. (2004), Absenteeism and Employment Protection: Three Case Studies, *Swedish Economic Policy Review*, n. 11, 95-114.
- [11] Ichino, Andrea & Riphahn, Regina T. (2005), The Effect of Employment Protection on Worker Effort: a Comparison of Absenteeism During and After Probation, *Journal of European Economic Association*, n. 3, pp.120-143.
- [12] Lazear Edward P & Rosen, Sherwin (1981). Rank-Order Tournaments as Optimum Labor Contracts, *Journal of Political Economy*, University of Chicago Press, vol. 89(5), pages 841-64, October
- [13] Regina T. Riphahn & Thalmaier Anja, (2001). Behavioral Effects of Probation Periods: An Analysis of Worker absenteeism, *Jahrbcher fr Nationalökonomie und Statistik (Journal of Economics and Statistics)*. 221(2), 179-201;
- [14] Johansson, Per & Palme Marten (2002). Assessing the Effect of Public Policy on Worker Absenteeism, *Journal of Human Resources* 37(2), 381-409.

Table 1: percentage of temporary workers on total employees

total	13.9
Man	11.7
Woman	16.8
Entry Level Certificate (elementare)	17.3
Lower Level Certificate (Licenza Media)	13.9
Upper Secondary Level	12.8
Degree	15.8
15-24	41.3
25-34	18.8
35-44	11.7
45-54	8.0
55-64	6.8
North West	10.3
North East	12.5
Centre	14.1
South	17.7
Islands	18.4
Agriculture	52.3
Industry Manufacturing	9.4
Construction	11.8
Trade	13.2
Service sector	14.3

Table 2: logit estimates of unpaid overtime work

	I quart	II quart	III quart	IV quart
Woman	-0.310*** (0.00)	0.113 (0.42)	-0.301*** (0.00)	-0.179* (0.02)
Entry level certificate	-0.668*** (0.00)	-0.415 (0.14)	-0.607*** (0.00)	-0.474*** (0.00)
Lower level certificate	-0.213* (0.02)	-0.569*** (0.00)	-0.132 (0.15)	-0.244** (0.00)
Upper secondary level cert.	-0.018 (0.81)	-0.302** (0.00)	-0.027 (0.74)	-0.100 (0.15)
North east	0.249*** (0.00)	0.189* (0.05)	0.260*** (0.00)	0.107* (0.03)
Centre	0.022 (0.71)	0.138 (0.20)	0.017 (0.79)	-0.115* (0.04)
Islands	-0.892*** (0.00)	-0.696*** (0.00)	-0.546*** (0.00)	-0.718*** (0.00)
South	-0.887*** (0.00)	-0.357** (0.00)	-0.749*** (0.00)	-0.844*** (0.00)
Temporary Job	-0.106 (0.18)	-0.185 (0.20)	0.019 (0.79)	-0.091 (0.21)
Part Time Job	-0.280*** (0.00)	-0.834*** (0.00)	-0.047 (0.54)	-0.192** (0.01)
Agriculture	-0.356 (0.10)	-0.097 (0.80)	0.257 (0.15)	-0.221 (0.23)
Energy industry	0.482** (0.00)	-0.130 (0.74)	0.845*** (0.00)	0.136 (0.45)
Transports (industry)	0.470*** (0.00)	-0.008 (0.95)	0.564*** (0.00)	0.356*** (0.00)
Construction	0.256* (0.02)	-0.245 (0.33)	0.343** (0.00)	-0.059 (0.59)
Trade	0.210* (0.02)	0.247 (0.10)	0.507*** (0.00)	0.351*** (0.00)
Hotels and restaurants	0.152 (0.28)	0.734*** (0.00)	0.446*** (0.00)	0.094 (0.48)
Transports (services)	0.517*** (0.00)	0.321 (0.07)	0.747*** (0.00)	0.512*** (0.00)
Banking and real estate	0.360** (0.00)	0.428** (0.01)	0.674*** (0.00)	0.377** (0.00)
Services for firms	0.390*** (0.00)	0.017 (0.91)	0.651*** (0.00)	0.359*** (0.00)
Government Public Administration	0.421*** (0.00)	-0.174 (0.24)	0.559*** (0.00)	0.352*** (0.00)
Other Services	-0.022 (0.87)	0.091 (0.64)	0.522*** (0.00)	-0.009 (0.94)
Company directors	-0.063 (0.79)	-0.395 (0.19)	-0.489 (0.08)	-0.078 (0.75)
Scientists	0.294* 8 (0.04)	0.285 (0.25)	0.078 (0.61)	0.162 (0.22)
Technicians	0.337** (0.00)	0.200 (0.38)	0.309** (0.01)	0.202 (0.05)
Clerks	0.282* (0.01)	-0.119 (0.62)	0.430*** (0.00)	0.207 (0.05)
Services and sales workers	0.437*** (0.00)	-0.003 (0.99)	0.613*** (0.00)	0.385*** (0.00)
farmers and skilled workers	0.367*** (0.00)	-0.363 (0.13)	0.442*** (0.00)	0.311** (0.00)
Craft and related	0.274* (0.01)	-0.701* (0.01)	0.353*** (0.00)	0.176 (0.08)



	I quart	II quart	III quart	IV quart
Second job	0.567** (0.01)	-0.033 (0.93)	-0.320 (0.27)	-0.075 (0.74)
Head of family	0.295* (0.01)	0.485* (0.01)	0.368** (0.00)	0.078 (0.47)
Single	0.355*** (0.00)	0.529** (0.00)	0.467*** (0.00)	0.183* (0.04)
Spouse	0.671*** (0.00)	0.838*** (0.00)	0.825*** (0.00)	0.588*** (0.00)
Non national (EU)	-0.180 (0.35)	-0.332 (0.47)	-0.414* (0.04)	-0.247 (0.12)
Non National (non EU)	-0.306* (0.01)	0.072 (0.79)	-0.227* (0.02)	-0.338*** (0.00)
White collar (executive manager)	-0.654*** (0.00)	1.540*** (0.00)	-0.592** (0.01)	-1.148*** (0.00)
White collar (senior manager)	-0.515*** (0.00)	1.153*** (0.00)	-0.537*** (0.00)	-0.685*** (0.00)
White collar (employee)	-0.112 (0.11)	0.549*** (0.00)	-0.214** (0.00)	-0.054 (0.42)
Other position	-0.113 (0.57)	1.039** (0.00)	-0.005 (0.98)	-0.066 (0.72)
Married	-0.082 (0.35)	-0.347* (0.02)	-0.248** (0.00)	-0.021 (0.79)
Separated/divorced/widower	0.177 (0.07)	0.046 (0.78)	-0.078 (0.44)	0.313*** (0.00)
small firm	-0.261*** (0.00)	0.124 (0.20)	-0.445*** (0.00)	-0.280*** (0.00)
No Coordination activity	-0.530*** (0.00)	-0.448*** (0.00)	-0.570*** (0.00)	-0.679*** (0.00)
No position		-0.334 (0.74)	-0.268 (0.54)	-0.939* (0.04)
Age	0.049** (0.01)	0.093** (0.01)	0.052** (0.00)	0.043* (0.01)
Age sq.	-0.081*** (0.00)	-0.118** (0.00)	-0.088*** (0.00)	-0.078*** (0.00)
Tenure	-0.001 (0.93)	-0.014 (0.31)	-0.011 (0.15)	-0.002 (0.75)
Tenure3	-0.000 (1.00)	0.042 (0.31)	0.025 (0.32)	0.015 (0.51)
Constant	-3.268*** (0.00)	-5.896*** (0.00)	-3.431*** (0.00)	-2.617*** (0.00)
pseudoR2	0.0678	. 0.0956	0.0660	0.0621
Number of obs.	43819	43545	42481	42746

p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 3: logit estimates of absence choice

	I quart	II quart	III quart	IV quart
Woman	0.260** (0.00)	0.182 (0.07)	0.086 (0.08)	0.209* (0.02)
Entry level certificate	-0.066 (0.60)	0.066 (0.64)	-0.230** (0.00)	-0.086 (0.48)
Lower level certificate	-0.198* (0.04)	-0.132 (0.19)	-0.213*** (0.00)	-0.196* (0.03)
Upper secondary level cert.	-0.112 (0.16)	-0.097 (0.25)	-0.135** (0.00)	-0.115 (0.12)
North East	0.100 (0.08)	0.069 (0.27)	-0.089* (0.01)	0.061 (0.28)
Centre	0.013 (0.84)	0.040 (0.58)	0.030 (0.44)	0.003 (0.96)
Islands	-0.327*** (0.00)	-0.347*** (0.00)	-0.223*** (0.00)	0.013 (0.87)
South	-0.255*** (0.00)	-0.233** (0.00)	-0.101** (0.01)	-0.114 (0.07)
Temporary job	-0.231** (0.00)	-0.468*** (0.00)	-0.217*** (0.00)	-0.147* (0.05)
Part Time Job	-0.007 (0.91)	0.033 (0.64)	-0.050 (0.22)	-0.132* (0.04)
Agriculture	0.094 (0.53)	0.053 (0.75)	-0.979*** (0.00)	-0.003 (0.98)
energy industry	0.271 (0.17)	0.099 (0.67)	-0.945*** (0.00)	0.027 (0.89)
Transport (industry)	-0.001 (0.99)	-0.287*** (0.00)	-0.423*** (0.00)	0.153* (0.04)
Construction	0.160 (0.15)	-0.595*** (0.00)	-0.624*** (0.00)	0.149 (0.17)
Trade	-0.178 (0.05)	-0.169 (0.08)	-0.619*** (0.00)	-0.248** (0.01)
Hotels and Restaurants	-0.190 (0.17)	-0.537*** (0.00)	-0.828*** (0.00)	-0.053 (0.70)
Transports (services)	-0.425*** (0.00)	-0.244 (0.05)	-0.782*** (0.00)	-0.122 (0.26)
Banking and Real Estate	-0.239 (0.09)	0.074 (0.59)	-0.796*** (0.00)	-0.388** (0.01)
Services for firm's	-0.229* (0.03)	-0.335** (0.00)	-0.641*** (0.00)	-0.267** (0.01)
Public Administration	0.016 (0.86)	0.226* (0.01)	-0.664*** (0.00)	-0.179 (0.05)
other services	-0.262* (0.03)	-0.249 (0.06)	-0.814*** (0.00)	-0.368** (0.00)
Company directors	-0.385 (0.15)	-0.563 (0.07)	0.249 (0.07)	-0.086 (0.72)
Scientists	-0.053 (0.70)	-0.130 (0.37)	0.178* (0.02)	-0.081 (0.55)
Technicians	-0.179 (0.10)	-0.131 (0.23)	-0.101 (0.11)	-0.077 (0.46)
Clerks	-0.220 (0.06)	-0.084 (0.46)	-0.187** (0.01)	-0.060 (0.58)
Services and sales workers	0.037 (0.71)	-0.053 (0.61)	-0.370*** (0.00)	-0.146 (0.15)
Farmers and skilled workers	0.089 (0.35)	0.137 (0.19)	0.070 (0.22)	0.057 (0.53)
Crafts and related	0.203* (0.05)	0.271* (0.01)	0.125* (0.04)	0.190 (0.05)

	I quart	II quart	III quart	IV quart
Head of the family	0.979*** (0.00)	1.289*** (0.00)	0.342*** (0.00)	0.837*** (0.00)
Single	0.714*** (0.00)	0.776*** (0.00)	0.064 (0.29)	0.481*** (0.00)
Spouse	0.521*** (0.00)	0.690*** (0.00)	0.005 (0.94)	0.338** (0.00)
Non National (EU)	-0.272 (0.19)	-0.091 (0.70)	-0.116 (0.33)	-0.616** (0.00)
Non National (non EU)	0.022 (0.85)	-0.428** (0.01)	-0.397*** (0.00)	-0.531*** (0.00)
White Collar (Executive Manager)	0.006 (0.98)	-0.258 (0.26)	-0.278* (0.02)	-0.228 (0.25)
White Collar (Senior Manager)	0.028 (0.83)	-0.335* (0.02)	0.258*** (0.00)	-0.114 (0.35)
White Collar (Employee)	-0.080 (0.32)	-0.103 (0.21)	0.216*** (0.00)	-0.074 (0.34)
Other Position	-0.405 (0.07)	-0.331 (0.24)	0.097 (0.43)	-0.668** (0.01)
Married	0.157 (0.10)	-0.013 (0.89)	0.185** (0.00)	0.144 (0.12)
Separated/divorced/widower	-0.105 (0.33)	-0.038 (0.73)	0.014 (0.82)	-0.068 (0.50)
Small firm	-0.179** (0.00)	-0.430*** (0.00)	0.009 (0.79)	-0.277*** (0.00)
No coordination Activity	0.214*** (0.00)	-0.003 (0.97)	0.125*** (0.00)	-0.092 (0.10)
No position	0.891* (0.04)	-0.265 (0.66)	0.230 (0.39)	-0.599 (0.24)
Age	-0.097*** (0.00)	-0.087*** (0.00)	-0.012 (0.27)	-0.068*** (0.00)
Age sq.	0.090*** (0.00)	0.074** (0.00)	0.011 (0.39)	0.064** (0.00)
tenure	0.027*** (0.00)	0.017 (0.05)	0.015*** (0.00)	0.009 (0.21)
tenure3	-0.051* (0.03)	-0.025 (0.34)	-0.018 (0.20)	-0.008 (0.72)
Constant	-1.334*** (0.00)	-1.322** (0.00)	-0.991*** (0.00)	-1.394*** (0.00)
pseudor2	0.0309	0.0409	0.0505	0.0280
Number of obs.	44221	44430	42848	43160

p<sub>i</sub>0.05, \*\* p<sub>i</sub>0.01, \*\*\* p<sub>i</sub>0.001

(references: sex: male, education: degree, geographical area: north west, contract: permanent, full time, sector education and health, occupation: elementary occupation, family position: son, nationality: nationals job position blue collar, family status: single firm's size big).

Table 4: Descriptive statistics by type of contract: men (age 16-20)

	Temporary	Permanent	Difference	$P(T > t)$
Entry level certificate	0.434783	0.213904	0.220879	0.2303
Lower level certificate	0.7173913	0.6256684	0.917229	0.0603
Upper secondary level cert.	2391304	0.3529412	-0.1138107	0.0163
Degree				
Nort west	0.29325	0.343757	-0.130551	0.041
North east	0.2119565	0.2673797	-0.0554232	0.1794
Centre	0.1032609	0.1497326	-0.0464718	0.0251
South	0.3043478	0.2032086	0.1011393	0.158
Islands	0.1847826	0.534759	0.1185984	0.0001
Agriculture	0.326087	0.641711	-0.0315624	0.158
Energy industry	0	0.0053476	-0.0053476	0.3219
Transports	0.2717391	0.2620321	0.009707	0.8332
Construction	0.2880435	0.2406417	0.474018	0.3018
Trade	0.1956522	0.1871658	0.0084864	0.836
Hotels and restaurants	0.1304348	0.1176471	0.7096	0.7096
Transports	0.271739	0.0053476	0.218263	0.0961
Banking Real estate	0.0054348	0	0.0054348	0.314
Services for firms	0.2117391	0.802139	-0.5903999	0.105
Public Adiministration	0	0	0	
education	0.0054348	0.0053476	0.0000872	0.9909
Other Services	0.0217391	0.0320856	-0.0103465	0.5397
small firm	0.7554348	0.67911444	0.07632036	0.1034
Big Firm	0.217391	0.374332	-0.156941	0.3743
Nationals	0.951087	0.9251337	0.0259533	0.3013
Non Nationals (EU)	0.108696	0	0.108696	0.1537
Non Nationals (extra EU)	0.380435	0.748663	-0.368228	0.1256

Table 5: Descriptive statistics by type of contract: women (age 16-20)

	Temporary	Permanent	Difference	$P(T > t)$
Entry level certificate	0.0128205	0.0111111	0.0017094	0.9195
Lower level certificate	0.6153846	0.5111111	0.1042736	0.1766
Upper secondary level cert.	0.3717949	0.4777778	-0.1059829	0.1682
Degree	0	0	0	0
Nort west	0.2179487	0.4111111	-0.1931624	0.0073
North east	0.2564103	0.2333333	0.023077	0.7303
Centre	0.1538462	0.0888889	0.0649573	0.1970
South	0.2435897	0.1555556	0.0880341	0.1539
Islands	0.1282051	0.1111111	0.01709399	0.7348
Agriculture	0	0.0111111	-0.0111111	0.3534
Energy industry	0	0	0	0
Transports	0.1282051	0.122222	0.0059831	0.9076
Construction	0.128205	0.2222222	-0.0940172	0.0298
Trade	0.2948718	0.1555556	0.1393162	0.0298
Hotels and restaurants	0.2051282	0.3444444	-0.1393162	0.0451
Transports	0.0128205	0.0222222	-0.0094017	0.03875
Banking Real estate	0.0108499	0.0135135	-0.0026636	0.098
Services for firms	0.0470163	0.0567568	-0.0097405	0.51
Public Adiministration	0.005425	0.0108108	-0.0053858	0.3559
Education	0	0.0189189	-0.0189189	0.0011
Other Services	0.0235081	0.0243243	-0.0008162	0.9366
small firm	0.8846154	0.7888889	0.09572651	0.098
Big Firm	0	0.033333	-0.033333	0.1049
Nationals	0.9230769	0.9	0.0230769	0.6035
Non Nationals ( UE)	0.012825	0.011111	0.001714	0.9195
Non Nationals (extra UE)	0.061026	0.088889	-0.027863	0.5515

Table 6: Descriptive statistics by type of contract: men (age 21-23)

	Temporary	Permanent	Difference	$P(T > t)$
Entry level certificate	0.144665	0	0.144665	0.2001
Lower level certificate	0.4339964	0.2810811	0.1529153	0.000
Upper secondary level cert.	0.5497288	0.7135135	0.1529153	0.000
Degree	0.0018083	0.0054054	0.1529153	0.3473
Nort west	0.2929476	0.2405405	0.1529153	0.0787
North east	0.2459313	0.2432432	0.2448537	0.9259
Centre	0.119349	0.1621622	-0.0428132	0.0635
South	0.2206148	0.2594595	-0.0388447	0.1737
Islands	0.1211573	0.945946	-0.8247887	0.2076
Agriculture	0.253165	0.405405	-0.15224	0.1942
Energy industry	0.090416	0.027027	0.063389	0.2407
Transports	0.3381555	0.3783784	-0.0402229	0.211
Construction	0.2585895	0.1486486	0.1099409	0.001
Trade	0.1790235	0.1486486	0.0303749	0.2256
Hotels and restaurants	0.079566	0.0945946	-0.0150286	0.2256
Transports	0.235081	0.621622	-0.386541	0.0029
Banking Real estate	0.108499	0.135135	-0.026636	0.7151
Services for firms	0.0470163	0.0567568	-0.0097405	0.51
Public Adimistration	0.005425	0.0108108	-0.0053858	0.3559
education	0	0.0189189	-0.0189189	0.0011
Other Services	0.0235081	0.0243243	-0.0008162	0.9366
small firm	0.6274864	0.4837838	0.1437026	0
Big Firm	0.560579	0.918919	-0.35834	0.0371
Nationals	0.954792	0.9675676	-0.0127756	0.3327
Non Nationals ( UE)	0.0036188	0.0054054	-0.0017866	0.6855
Non Nationals (extra UE)	0.0415913	0.027027	0.0145643	0.2433

Table 7: Descriptive statistics by type of contract: woman (age 21-23)

	Temporary	Permanent	Difference	$P(T > t)$
Entry level certificate	0.0069204	0	0.006920	0.1536
Lower level certificate	0.2906574	0.2142857	0.076372	0.034
Upper secondary level cert.	0.6955017	0.7721088	-0.076607	0.036
Degree	0.0069204	0.136054	-0.129134	0.4248
Nort west	0.3321799	0.2959184	0.036261	0.3464
North east	0.2318339	0.2789116	-0.047078	0.1932
Centre	0.1280277	0.1938776	-0.065850	0.037
South	0.21107727	0.1496599	0.061417	0.0538
Islands	0.0968858	0.0816327	0.015253	0.5191
Agriculture	0.138408	0.0238095	0.114599	0.3773
Energy industry	0.0034602	0	0.003460	0.3136
Transports	0.200692	0.1938776	0.006814	0.8366
Construction	0.207612	0.170068	0.037544	0.7396
Trade	0.2629758	0.2380952	0.024881	0.489
Hotels and restaurants	0.1522491	0.1632653	-0.011016	0.7158
Transports	0.311419	0.442177	-0.130758	0.4083
Banking Real estate	0.0346021	0.0272109	0.007391	0.6067
Services for firms	0.0865052	0.1054422	-0.018937	0.4387
Public Adiministration	0.0103806	0.0204082	-0.010028	0.327
education	0.0519031	0.0714286	-0.019526	0.3283
Other Services	0.1314879	0.0952381	0.036250	0.1678
small firm	0.7474048	0.622449	0.124956	0.0011
Big Firm	0.0207612	0.0442177	-0.023457	0.1111
Nationals	0.9342561	0.9489796	-0.014724	0.8036
Non Nationals ( UE)	0.0207612	0.0238095	0.017772	0.2503
Non Nationals (extra UE)	0.0122133	0.0095049	0.002708	0.2503