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# The trend over time of labour market opportunities for young people in Italy

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**Abstract** We analyse the re-employment probabilities of young people (ages 15–24) from 1985 to 2004. We find that this 20 year period decades were characterized by an increase in youth employment, especially since the mid-1990s. Nonetheless, the employment opportunities offered to disadvantaged workers were primarily atypical and therefore did not imply a stable and permanent increase in the bulk of youth employment. In addition, although the increase in re-employment probabilities by atypical contract would be largely explainable by flexibility policies, the evolution of re-employment probabilities by permanent and fixed-term contracts would be a consequence of competing causes, including a selection of higher productive workers.

**Keywords** Re-employment probabilities · Duration models · Young workers · Institutional changes · Workforce composition

**JEL Classification** J64 · J08 · C41

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# 1 Introduction

The issue of European unemployment has been largely debated in the academic literature. After the economic downturn due to the oil shock of the 1970s, many European countries experienced a relevant increase in unemployment rates, especially among young individuals and other disadvantaged groups in the labour market.

Large differences/heterogeneous unemployment trends were observed across European countries. Nonetheless, the problem is magnified everywhere when focusing on young people. Youth unemployment was indeed very high in the late nineties in Italy, France, and Spain, where it stood at approximately 25 % (Contini and Poggi 2012; Howell et al. 2006).[1] The causes of the rise in youth unemployment range from the effectiveness of the educational system at easing the transitions from school to work (OECD 2000) to labour market institutions (e.g., labour costs and flexibility), the role of the family of origin as social and economic buffer (Becker et al. 2004), and factors related to changes in the composition of the population.

Studies document the presence of state dependence for youth unemployment in Europe and therefore also in Italy (Torelli and Trivellato 1989; Ordine 1992; Addison et al. 2004). The existence of negative duration dependence and the mechanism that produces stigmatization, discouragement and human capital depreciation in the course of joblessness is also explored (Contini and Poggi 2012). In addition, youth unemployment in Italy and in other Mediterranean countries (e.g., Spain) shows relevant gender (Azmat et al. 2006)[2] and geographical differentials, which are well-known structural characteristics of the Italian labour market (Bertola and Garibaldi 2003; Ricciardi 1991).

Labour market rigidity and reduced competitiveness in the globalizing world have been considered the main causes of the lack of performance of European labour markets, especially for Southern countries.

During the period analysed, many labour market institutions have been reformed, with the aim of increasing their flexibility and competitiveness, through a reduction of labour costs and incomes policy and by relaxing employment protection legislation. The main institutional changes in Italy (see Sect. 2) involved the mechanism of wage determination and the bargaining process through the abolition of the automatic wage indexation ("scala mobile") and the introduction of the "Protocollo sulla politica dei redditi e dell'occupazione, sugli assetti contrattuali, sulle politiche del lavoro e sul sostegno al sistema produttivo" in 1993.

In addition, beginning in the late 1990s, a step-by-step reform at the margin was implemented, aimed at increasing flexibility of the Italian labour market by

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[1] In Italy, the youth unemployment rate is slightly higher with respect to the mentioned 25 %. The overall youth unemployment rate was approximately 27.7 % in 1999. This figure is the average of approximately 26.6 % for males and 37.4 % for females. The unemployment gender gap in Italy is also quite relevant for young people. These figures are available on the Internet at http://stats.oecd.org/.

[2] The study by Azmat et al. (2006) emphasizes that in countries where the unemployment gender gap is high (Mediterranean countries), i.e., where the female unemployment rate is significantly greater than that of males, the unemployment problem is largely a problem of female unemployment. Typically, these countries also have very high youth unemployment rates and high youth unemployment gender gaps.

introducing new atypical contractual forms.[3] The labour market institutions have also been reformed in many other European countries, especially those character-ized, as is Italy, by high employment protection such as France and Spain.[4]

Studies have analysed the effects of the flexibility process in European countries in particular. For Italy, Montanino and Sestito (2003), Ichino et al. (2005), Gagliarducci (2005) and the most recent work of Berton et al. (2011) emphasized the effect of a wider use of temporary contracts on the job perspectives of young Italian workers, including the existence of port-of-entry effects.[5] Results indicate that undertaking temporary employment instead of being unemployed has a substantially positive effect on the probability of transition towards a stable job. For France and Spain, Bentolila and Dolado (1994), Bentolila et al. (2012) and Blanchard and Landier (2002) instead documented that transitions from temporary to permanent employment were low, signalling that reforms may have created a rather segmented labour market, with low mobility from temporary to permanent employment.

Finally, the Italian economy was characterized by a deep currency (and financial) recession in 1992–1993 (Krugman 1996), accompanied by the devaluation of the Italian currency, an increase of the public debt and the introduction of an emergency fiscal package (Casadio 2003). In the short term, the crisis certainly lowered the employment perspectives of young people, whereas in the medium term, policies to fight the economic downturn may have produced a positive effect in terms of economic and employment growth. The late 1990s were also characterized by a reduction in labour market participation of young people because of an increase in enrolment in tertiary education that involved young females in particular (OECD Statistics 2013).

In this changing context, employment opportunities for young people are likely to be varied. Understanding the mechanisms underlying re-employment probabil-ities and their evolution is crucial in the academic and political debates, especially after the crisis. We add to the existing literature providing evidence of jobless duration of young people for a sufficiently long time span (period 1985–2004), a very peculiar situation considering the changes implemented in the Italian institutional setting. The paper uses one of the few relevant Italian databases, the Work Histories Italian Panel (WHIP),[6] allowing the study of transitions from different labour market statuses. By adopting a competing-risks discrete-time hazard model considering unobserved heterogeneity, the paper also focuses on a very specific age group—youth aged 15–24—that is facing increasing problems in the labour market in many countries worldwide.

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[3] Until the second half of the nineties, the standard work arrangement in Italy was full-time, open-ended, and characterized by one of the strictest employment protection laws, mostly against dismissals, in the OECD area (Lazear 1990; Kugler and Pica 2008; Leonardi and Pica 2013).

[4] The reform process also involved countries with relatively little employment protection regulation, such as the UK and the US (Booth et al. 2002).

[5] Other studies on the 'dead end' or 'springboard' effects of temporary contracts include D'Addio and Rosholm (2005) and Güell and Petrongolo (2007).

[6] For a description of the features and limits of the WHIP data, see Mussida and Sciulli (2015).

Finally, we provide a step-by-step analysis aimed at analysing different competing causes (including business cycle, workforce composition, structural changes in the labour market and labour policies/institutional changes) of the evolution of employment opportunities in the investigated period. In this context, we focus particularly on residual heterogeneity in re-employment probabilities. Our aim is as follows: after controlling for individual and job-related characteristics, structural changes in the labour market and the effect of the cycle, we interpret the residual year-to-year dynamics in the light of policy intervention or other unobserved economic facts.

Our findings suggest that the changes characterizing the Italian labour market have led to an increase in employment opportunities for young people, especially since the second half of the 1990s. The rise was especially relevant for atypical contracts. The share of temporary employment in total employment in fact increased throughout the period, especially for young people.

Among the competing causes of the rise of atypical employment opportunities, there is the effect of the legislation of the nineties, particularly the Treu Package, which spread the use of flexible contractual forms for disadvantaged labour market categories (including young people). This expanded use largely explains the increase of re-employment probabilities by atypical contracts. In contrast, the evolution of employment opportunities by permanent contract seems to be the result of competing causes, including the business cycle, structural changes in the labour market and changes in workforce composition in particular.

In summary, the overall behaviour of the hazards confirms the tendency towards increased employment stability. The bulk of employment, therefore, is largely determined by increased permanence in this state and not by increased employment opportunities for disadvantaged categories, i.e., young people. These opportunities were indeed primarily atypical and temporary contracts and therefore did not imply a stable and permanent increase of the bulk of young employed. This lack of stability might be a signal of the lack of efficacy of the legislation of the period analysed in increasing permanent employment opportunities for young people.

The remainder of this paper is organized as follows: Sect. 2 describes the main changes of the Italian labour market from the mid-1990s to the mid-2000s. Section 3 provides the empirical specification for this study, and Sect. 4 describes the data and the samples. The results of the econometric analyses and the interpretations of both the evolution of re-employment probabilities and the residual year effects are provided in Sect. 5. Section 6 concludes.

## 2 Italian labour market from 1985 to 2004

The 20-year period from the mid-1980s to the mid-2000s has been particularly significant for the Italian labour market. Changes in macroeconomic conditions, changes in the labour force structure, and the reforms promoted to fight high unemployment rates and to increase competitiveness may have affected individual employment perspectives, particularly those of younger individuals.

From one perspective, the late 1980s and early 1990s saw the end of the positive performance of youth employment experienced since the 1960s due to the baby boom and the increase of female labour market participation (Contini and Grand 2010). In addition, although economic growth characterizing the Italian economy after the 1993 recession drove an increase in the employment rate of prime-age individuals, particularly women, the employment rate for youth decreased in the early 1990s and remained stable thereafter. A related relevant change in that period concerned an increase in the enrolment in tertiary education of young individuals. According to OECD statistics, the share of young women (aged 20–24) with upper secondary or tertiary education attainment increased from 58.3 % at the beginning of the 1990s to 77.9 % in 2004. In the same period, the similar share of young men increased from 51.7 to 67.7 %. These figures are consistent with the decrease in youth labour force participation that was exacerbated in the early 2000s after the reform of the university system according to the guidelines suggested by the Bologna Process. This decrease also helps to explain why the reduction in youth unemployment rates since the late 1990s has not been accompanied by an increase in youth employment rates (see Fig. 2 in Appendix).

From another perspective, the labour market conditions of young individuals may have been affected by the relevant reform process experienced by the Italian economy since the 1980s. In that period, policy makers introduced significant legislative changes aimed at countering high unemployment rates, high inflation rates, stagflation, and increasing public debt. In this context, the Italian labour market, one of the most rigid among EU/OECD countries (see Table 2 in Appendix), has been affected by reforms aimed at increasing its flexibility and competitiveness through the reduction of labour costs and incomes policy and by relaxing the employment protection legislation.[7]

From a wage perspective, the most relevant changes involved the mechanism of wage determination and the bargaining process through the abolition of the "scala mobile" (a mechanism of wage indexation to price inflation; see Pastore 2010) and the introduction in 1993 of the "Protocollo sulla politica dei redditi e dell'occu-pazione, sugli assetti contrattuali, sulle politiche del lavoro e sul sostegno al sistema produttivo" (the Protocol, hereafter). Because the "scala mobile" granted the same absolute wage increase to all employees as prices increased, it may have caused a compression of wage distribution. Therefore, its abolition may have contributed to widening the wage distribution (Manacorda 2004). In addition, the Protocol introduced two-wage bargaining levels (at the industry and at the firm level) and implemented control of price growth (following the 1984 Tarantelli proposal; see Acocella and Leoni 2007). These changes may have decreased real wages (Pastore 2010). Finally, policies implemented to fight the economic downturn had, in the medium term, both a direct and an indirect effect on employment. On the one hand, the widening of the wage distribution might be associated with a relative decrease of the labour costs of less-qualified workers, increasing their employment prospects.

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[7] Other legislative changes of the Italian labour market concerned the reform of the "Cassa integrazione guadagni" (CIG) (see Dell'Aringa and Lucifora 2000, for more details), the decentralization of public employment services and the liberalization of employment services, allowing the entry of private companies.

On the other hand, policies aimed at stimulating economic growth contributed to increase employment in subsequent years.

From an employment perspective, the most relevant change in the three decades affecting the Italian labour market (as for other EU labour markets) was the implementation of a "step by step" reform "at the margin"[8] aimed at making the labour market more flexible. From the mid-1980s until the mid-2000s, the market has been liberalized by the use of pre-existing temporary contracts and the introduction of new atypical contractual forms, all characterized by fixed-duration limits and with lower labour costs when compared with open-ended contracts. Consistent with theoretical predictions, empirical evidence suggests that flexibility policies enhanced the employment opportunities for outsiders (such as young people) and contributed to reducing youth unemployment rates. Nevertheless, temporary workers experience a greater risk of layoffs in the case of economic downturns (e.g., Boeri and Garibaldi 2007) and greater turnover characterizing apprenticeship workers after the introduction of "Biagi's Law" (Cappellari et al. 2012). Flexibility policies affected the re-employment probabilities of Italian workers by increasing segmentation between the short- and long-term unemployed (Mussida and Sciulli 2015).

## 3 Econometric specification

We estimate the re-employment probabilities of young people using discrete-time hazard models.[9] The conditional probability that a transition to employment occurs in a given interval $(a_{j-1}, a_j)$ in the $j_{th}$ period, conditional on the time already spent in non-employment, is defined as follows:

$$h_j \equiv \Pr\{T \in [a_{j-1}, a_j) | T \geq a_{j-1}\}, \tag{1}$$

where the realization j of the discrete random variable T is the recorded spell duration, assuming unit-length intervals.

A discrete-time hazard model requires that data be organized into a 'sequential binary form', implying that data form an unbalanced panel of individuals with the $i_{th}$ individual contributing to j = 1, 2,...t observations, where j is the number of periods at risk of the event.[10] Because some individuals transit to employment and possibly revert to unemployment, multiple spells may be observed, q = 1, 2,...Q.

We adopt a complementary log–log (cloglog) specification, which consists of the discrete time representation of a continuous time proportional hazard model. Specifically, we estimate a piecewise constant baseline hazard by using a non-

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[8] Since the 1990s, single laws or more-complex reforms have been introduced in the Italian labour market: the so-called "Treu Package" introduced by Law No. 196/1997, Legislative Decree No. 368/2001, Law No. 30/2003 ("Biagi's Law"), and Legislative Decree No. 276/2003.

[9] The characteristics of our data, i.e., interval-censored data, allow estimating discrete-time hazard models (Prentice and Gloecker 1978).

[10] Specifically, a binary dependent variable was created. If individual *i*'s survival time is censored, then the dependent binary variable always takes value zero. If instead individual *i*'s survival time is not censored, the dependent binary variable is zero in the first *j-1* observation and one in the last observation.

parametric piecewise constant exponential specification, i.e., groups of months are assumed to have the same hazard rate, but the hazard may differ between groups. The total spell of non-employment is divided into specific sub-spells for specific groups of months.[11] The model is estimated by maximum likelihood and the total log-likelihood function for employment is the following:

$$\log L(\beta, \gamma) = \left[ \sum_{i=1}^{N} \sum_{q=1}^{Q} \sum_{j=1}^{t} \left( y_{iqj} \log h_{iqj} + (1 - y_{iqj}) \log (1 - h_{iqj}) \right) \right] \quad (2)$$

where, $y_{ij}$ takes the value one if the individual transition occurs in month j (i.e., the spell is uncensored), and zero otherwise.

We also analyse the re-employment probabilities by type of contract, i.e., permanent and fixed-term contracts (PC) or atypical contract (AC) and we present this exercise as further estimates. For the analysis by contract type, models are estimated assuming independent competing risks, which allows estimating models separately for each destination state (Narendranathan and Stewart 1993).[12]

Because unobservable individual effects from omitted variables and measurement errors in the observed variable might bias our estimates (Jenkins 2005), we use a specification that allows modelling unobserved heterogeneity by assuming a Gaussian distribution defined at the individual level. We estimate random-effect cloglog models.[13] The use of a piecewise constant specification reduces estimation bias problems, and the estimation results may be considered reliable (Nicoletti and Rondinelli 2010).

The hazard function assuming a cloglog specification with Gaussian unobserved heterogeneity is defined as follows:

$$h(j, X | v) = 1 - \exp\{\alpha + \beta X + \gamma_j + \log(v)\} \quad (3)$$

where, $\log(v) \equiv u$ has a Normal distribution with zero mean and finite variance, $\alpha$ is a constant term, X is a set of covariates, and $\beta$ is a set of parameters to be estimated. The necessary condition to estimate this model is that neither the survival nor the density function expressions that enter the likelihood function are conditioned by unobserved effects. The likelihood contributions are therefore obtained by integrating out the random terms, as is appropriate for the Gaussian case because the integral does not have a simple closed form.

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[11] We divided the total spell of non-employment into nine sub-spells for these groups of months: 1–3, 4–6, 7–9, 10–12, 13–18 (base category), 19–24, 25–36, 37–48, and over 48 months.

[12] Because of the independence assumption, the total log-likelihood function logL(β,γ) for the two type of employment is the sum of the partial log-likelihood functions derived for the contracts of destination PC and AC.

[13] We use STATA (ver 12.1) statistical software, which provides a command, xtcloglog, to estimate random-effect complementary log–log models.

## 4 Data

The WHIP is a database of individual working histories based on the Italian Social Security Administration (INPS) archives. The database consists of a representative sample of the population of employees of the private sector (excluding agriculture), apprentices, self-employed, and atypical contracts. The sample-population ratio is 1:180 for an overall dynamic population of approximately 370,000 individuals.

The data cover the period 1985–2004, which was characterized by relevant institutional changes, changes in workforce composition, and evolution of socio-cultural aspects.[14] The database permits the identification of job relationships based on the social security contributions paid monthly to the INPS by employers and workers. Non-employment (NE) spells are therefore identified as periods characterized by the absence of paid social security contributions by both employers and workers.

Because survival time occurs in continuous time, but the spell lengths are observed only at monthly intervals, the data are actually interval-censored. Nonetheless, although the data are available only up to 2004, the use of the WHIP dataset is recommended because it provides monthly information on private employment relationships, permitting the precise estimation of transition times.[15] In addition, from the type of contribution rebates, it is possible to identify the contractual forms held by individuals, i.e., permanent and fixed-term contracts (PC) or atypical contracts (AC) [including on-the-job training contracts (OJTC) and temporary agency contracts (TAC)], which make a competing risks analysis possible. These information allow making an additional analysis by distinguishing between PC and AC. We present these as further estimates in our paper. The primary focus is indeed on re-employment probabilities as a whole.

From the original sample, we selected information for young individuals in the age range 15–24 in the analysed period. This selection resulted in a sub-sample of 37,702 individuals and 76,799 spells, corresponding to 1,046,041 times at risk. This selection also enabled us to reconstruct complete individual working histories with accuracy.[16] The first month of a new employment relationship permits identification of the time of exit from the state of non-employment, and the type of contract that characterizes the new job enables the identification of multiple failures

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[14] For details, see Sect. 2.

[15] WHIP data do not present attrition problems because if the worker or the firm is enrolled with INPS, they must provide INPS with all of the information. In addition, as stated in the relevant literature/empirical evidence based on the WHIP data (e.g., Contini and Grand 2010; Grand and Quaranta 2011; Contini and Poggi 2012) and in the specific documentation of those data (LABORatorio Revelli 2009), the residual attrition that we observe is the product of perfectly explainable patterns of workforce utilization that do not relate to data collection.

[16] When constructing our sub-sample, if an individual was simultaneously in more than one work relationship, we eliminated the shorter job relationship; if the relationships were of the same duration, we removed the part-time job or the work relationship characterized by fewer days of actual work. Finally, when the second job started before the end of the first job but ended after the end of the first job, we censored the second work spell to the left and hypothesized that the second job started only when the first ended. Thus, the passage from a double job to a single one is viewed as a transition from one job to another. This strategy is adopted to reconstruct the non-employment duration spells with accuracy.

characterizing the competing risks analysis. The WHIP data make a set of individual and job-related variables available. Specifically, information is provided on age, gender, working area, working conditions, firm size, illness, wage, sector of economic activity and cumulated previous work experience in permanent and fixed-term, and atypical contracts. Working characteristics refers to the conditions existing during previous work experience.

The description of the variables and the summary statistics by gender and for the total sample for the most relevant variables used in the econometric analyses are reported in Table 3 in the Appendix.[17] In addition, we identify three cohorts: individuals born in 1961–1970, 1971–1980, and 1981–1988. We include these cohort dummy variables in our set of covariates. The same cohort dummy variables have been interacted with relevant individual and job-related characteristics, i.e., gender, geographical area and sector of economic activity, which should be helpful to provide an interpretation of structural changes in the labour market.[18] The business-cycle effect is controlled for by introducing the expected (next quarter) employment growth rate and by assuming rational expectations.[19]

Note that although the use of the WHIP dataset for analyses of non-employment duration is recommended for a host of reasons, the dataset has at least four relevant limitations. First, individuals pertaining to the labour market states of unemployment and inactivity are collapsed into the category of non-employed. Second, those employed in the public sector are not included in our dataset. Thus, the movements from the private to the public sector go unrecorded, implying an overestimation of joblessness duration for individuals moving from private to public employment. However, because this movement is rare for young people (Dickson et al. 2014), we are confident that the consequent bias would be negligible. Third, re-engagement in education of school-leavers is unobservable. Finally, because firms pay the same rate of social security contribution for permanent and fixed-term contracts (FTC),[20] i.e., a social contribution rate of 31 % of gross earnings and because both PCs and FTCs do not provide any tax relief (e.g., Cappellari et al. 2012), FTCs are assimilated with PCs in the WHIP data. For these reasons we consider the category of permanent and fixed-term contracts and the category of atypical contracts in our estimates. This assimilation may prevent from a more relevant source of bias when estimating re-employment probabilities in our further estimates by type of contract.

The use of WHIP data allows analysing the evolution of atypical contracts, although some information is not available and remains missing in the official data.

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[17] We also control for time by using yearly dummies for the overall period examined, which are not reported here for brevity. Nonetheless, these statistics are available upon request.

[18] The related results for both cohort dummies and their interactions are showed in Table 4 in Appendix. In addition, main estimations (Table 1) result from a specification accounting for the role cohort dummy variables and related interactions.

[19] Employment growth is measured with respect to the next quarter employment level using data from the 'Rilevazione sulle Forze di Lavoro' gathered by ISTAT.

[20] A fixed-term contract of employment is defined as a contract of employment that has a definite start and end date, terminates automatically when a particular task is completed, or terminates after a specific event (other than retirement or summary dismissal). Legislative Decree No. 368/2001 liberalized the use of fixed-term contracts to allow firms to use them to adapt quickly to changes in economic conditions.

**Table 1** Re-employment probabilities for overall employment and by contract type, 1985–2004

| | Overall employment | | Permanent and fixed-term contract | | Atypical contract | |
|---|---|---|---|---|---|---|
| | Coeff. | SE | Coeff. | SE | Coeff. | SE |
| Age | 0.469 | 0.026*** | 1.220 | 0.034*** | −0.270 | 0.048*** |
| Age square | −0.010 | 0.001*** | −0.025 | 0.001*** | 0.002 | 0.001 |
| Male | 0.119 | 0.019*** | 0.112 | 0.021*** | 0.152 | 0.038*** |
| North–west | 0.266 | 0.024*** | 0.273 | 0.028*** | 0.260 | 0.049*** |
| North–east | 0.346 | 0.025*** | 0.329 | 0.028*** | 0.389 | 0.048*** |
| Centre (base-category) | | | | | | |
| South-Islands | −0.253 | 0.025*** | −0.160 | 0.028*** | −0.832 | 0.059*** |
| Blue-collar | −0.178 | 0.022*** | −0.208 | 0.024*** | 0.079 | 0.052 |
| Firm size: missing | 0.012 | 0.033 | −0.019 | 0.037 | 0.107 | 0.071 |
| Firm size: 1–9 | −0.021 | 0.017 | −0.095 | 0.020*** | 0.136 | 0.033*** |
| Firm-size: 10–19 | 0.054 | 0.019*** | 0.037 | 0.022* | 0.051 | 0.037 |
| Firm size: 20–199 | 0.021 | 0.018 | 0.033 | 0.020 | −0.047 | 0.035 |
| Firm size: 200 or more (base-category) | | | | | | |
| Illness period | −0.055 | 0.019*** | −0.088 | 0.023*** | 0.092 | 0.034*** |
| Wage | 0.000 | 0.000*** | 0.000 | 0.000 | −0.003 | 0.000*** |
| Manufacturing (base-category) | | | | | | |
| Construction | 0.003 | 0.026 | 0.051 | 0.029* | −0.234 | 0.056*** |
| Commerce | −0.135 | 0.026*** | −0.120 | 0.029*** | −0.112 | 0.051** |
| Tourism | −0.064 | 0.026** | 0.023 | 0.029 | −0.460 | 0.054*** |
| Transport | 0.031 | 0.050 | 0.083 | 0.054 | −0.463 | 0.134*** |
| Intermediation-business | −0.043 | 0.035 | −0.036 | 0.039 | −0.053 | 0.078 |
| Other sectors | −0.184 | 0.025*** | −0.157 | 0.028*** | −0.458 | 0.059*** |
| Cumulated PC experience | 0.008 | 0.000*** | 0.009 | 0.000*** | −0.003 | 0.001*** |
| Cumulated AC experience | 0.007 | 0.001*** | 0.011 | 0.001*** | 0.011 | 0.001*** |
| Expected employment growth | 0.088 | 0.003*** | 0.068 | 0.003*** | 0.138 | 0.005*** |
| Constant | −8.196 | 0.288*** | −17.544 | 0.376*** | 0.108 | 0.505 |

Source: our elaborations of WHIP data

\* Significant at the 10 % level; \*\* significant at the 5 % level; \*\*\* significant at the 1 % level

For these reasons, it is relevant to provide details on available atypical contracts in the considered period and their use in percentage terms. Since the late-1990s, as mentioned above, Italian legislation introduced a high number of atypical contracts to facilitate access to employment, particularly for young people. Given the high number of different atypical contracts available, finding punctual and specific statistics (incidence on total employment and/or usage in percentage terms) for each contractual form is difficult. Examining the available statistics for 1996–2003 and, therefore, the period characterised by the introduction of the most relevant atypical contractual arrangement (up to the end of the period analysed in this paper), as also explained in the literature (e.g., Tronti and Ceccato 2005; ISTAT 2004), wage employment grew by almost 1.7 million registered jobs. However, at an average

annual rate of 2.5 %, non-standard registered jobs—including strictly and partly atypical contract types (agency working, fixed-term employees, external solidarity contracts, youth work-and-training or CFL, homeworking, permanent employees working part-time and apprenticeships) increased by 870 thousand at a rate of 6.4 % per year.

In 2003, wage employment in non-agricultural private-sector firms increased by 3 %, a rate higher than the average between 1996 and 2003 (2.5 %). The main increase was due to standard employment, which rose by 2.4 %, contributing to total growth with a 76.1 % share. However, non-standard employment showed a new, strong rise of 5.3 %. The vigorous growth of atypical work in the whole period is largely ascribed to the new contract types introduced or boosted by the so-called Treu Law Package (law No. 196, of 1997). This law regulated temporary employment arrangements and introduced agency working into the Italian labour market. New incentives for known arrangements, such as youth work-and-training schemes, apprenticeships, and part-time, are allowed. Specifically, the number of atypical employee jobs stabilized in 2003 at a value greater than 2.4 million, corresponding to 23.9 % of total wage employment registered jobs in the private non-agricultural sector.

As noted earlier, this estimate of atypical work arrangement growth is partial because it covers only a (majority) share of non-standard wage earners. Long-term freelancers, among the self-employed, constitute the other fundamental perspective on the story of the diffusion of atypical work in Italy, a perspective for which we still lack sufficient information. In addition, we examine the incidence of atypical contractual arrangements on wage employment in the non-agricultural private sector. The public sector is not considered by those official statistics and is not included in our dataset.

We can interpret the above evidence on the incidence of atypical contracts by concluding that the introduction in the Italian labour market of a wide variety of non-standard working arrangements has certainly favoured employment growth, contributing 53 % to the 1.7 million jobs increase obtained from 1996 to 2003 in non-agricultural private sector wage employment.

# 5 Results

## 5.1 Estimation results

The relationship between the hazard rate to overall employment, as well as to PC and AC, and the time spent in non-employment for the overall sample of young in the age range 15–24 through the period 1985–2004 is shown in Fig. 1.

The Figure reveals a negative relationship between the hazard rate and the time spent in non-employment (negative duration dependence) for exits to overall employment and, as expected, for both the categories of permanent/fixed-term and atypical contracts. We also found that the probability rate has a non-monotonic pattern with two peaks for periods of 1–3 and 10– 12 months' duration; however, after 1 year of unemployment, the probability of finding a job (either
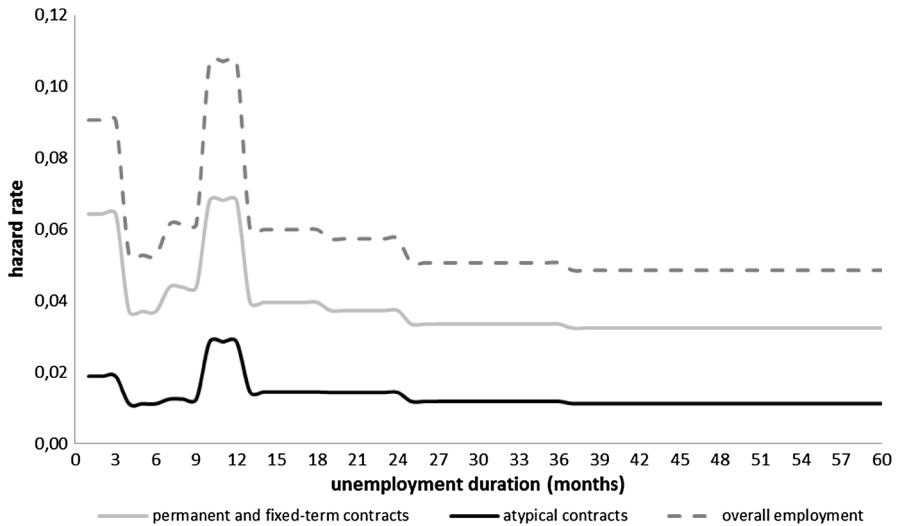
**Fig. 1** Piecewise constant baseline hazard rate for overall employment and by contract type, 1985–2004. Source: our elaborations of WHIP data

permanent/fixed-term or atypical) falls quite sharply. Note that although the 1–3-month peak and the pattern after 1 year are consistent with a standard finding of negative duration dependence, the 10–12-month peak is a possible consequence of the design of standard unemployment benefits in Italy. In particular, individuals might reduce their search efforts during the period in which they are protected by unemployment benefits, whereas these efforts sharply increase as the provision of unemployment benefits ends (Mussida and Sciulli 2015).

In general, the baseline hazards for an exit to employment (as a whole) are higher in absolute values compared with exits to PC and especially to AC. In detail, individuals with short-term non-employment (STNE) durations exhibit a higher probability of exiting from non-employment and entering permanent and fixed-term contracts and temporary contracts compared with individuals with long-term non-employment durations and compared with women (both STNE and LTNE).

The graphical analysis offered in the Appendix helps to detect gender and geographical differentials in employment opportunities, which are well-known structural characteristics of the Italian labour market. Indeed, Figs. 3, 4, and 5 in Appendix show the hazard rates to overall employment, to PC, and AC, by gender and geographical area. Specifically, we show the relationships between the hazard rate by gender and area (interacted) and the time spent in non-employment. We consider the hazard rates for men and women in the North and South of Italy.[21] For

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[21] The Figures in the Appendix show the interactions between gender, i.e., (M)ale and (F)emale, and area, i.e., (N)orth and (S)outh, and we obtain a total of four combinations (MN, MS, FN, and FS in the legends of the figures). In a first attempt, we also included the hazard for men and women living in the Centre of Italy. Nonetheless, to keep the graphs more clearly interpretable, we chose to keep only the north and the south. These two partitions, indeed, do show the highest gender gap in employment opportunities. The results including the gender and Centre interactions are available upon request.

overall employment, young in the North of both genders have higher hazards of leaving non-employment compared to young living in the South of Italy (Fig. 3 in Appendix). For both types of contracts (PC and AC, Figs. 4, 5 in Appendix, respectively), young in the North—women for PC and men for AC—have higher hazards of leaving non-employment compared with a young resident in the South of Italy. The disadvantage of the South, in terms of employment opportunities of the young, is especially evident for the exits to AC (the baseline hazards are indeed quite close to zero, especially for men; see Fig. 5 in Appendix), possibly as a consequence of composition effects. For example, economic sectors are associated with different hazard rates, and those rates prevailing in Southern regions (such as the construction sector) are associated with lower re-employment probability by AC.

Our findings therefore confirm the presence of structural gender and geographical differentials in the Italian labour market (Bertola and Garibaldi 2003; Ricciardi 1991).

Table 1 shows the effects of the covariates used in our econometric analysis. We control for individual characteristics, cumulated job experience in either PC or AC, and job-related and macroeconomic characteristics.[22] All of the estimates must be interpreted as the relative effect of each control variable with respect to the base-category outcome, i.e., the state of non-employment.[23]

In terms of age, we find that younger people have lower hazards of exiting from non-employment to employment as a whole. This is especially true for the exits to permanent and fixed-term contracts, whereas they have higher atypical employment prospects compared with older people. This finding is in line with expectations because the legislation of the nineties aimed at increasing the employment opportunities of younger people by introducing new and atypical contracts.

We add controls for gender and area of residence, which are two relevant and structural characteristics of the Italian labour market. The estimation results confirm the differences by gender and the geographical differentials, and are in line with the graphical analyses by gender and area shown in the Figs. 3, 4, and 5 in Appendix. Our findings therefore also suggest the presence of gender and geographical differentials for young people in the labour market. In addition, the estimated occupational variable parameters, distinguishing between blue and white-collar workers, suggest that white-collar workers are more likely to be employed in general (first column in Table 1) and especially in stable job relationships. This observation may highlight the existence of segmentation in terms of quality of re-employment probabilities between qualified and less-qualified workers. Additional evidence is provided in the Figs. 6 and 7 in Appendix.

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[22] For brevity, we did not report the duration dependence parameters for the sub-spells of non-employment duration (see footnote 11). The full set of estimates is available upon request.

[23] Thus, an estimated coefficient with a positive sign indicates that the explanatory variable positively affects the re-employment probability rather than favouring permanence in the non-employment state. Moreover, as the non-employment state is the common base-category, the sign and the magnitude of the same explanatory variable estimated for different transitions (NE-PC or NE-AC in Table 1) define the differential effect (due to a specific covariate) on the probability of transition to alternative employment states.

Five dummy variables control for the role of firm size. Estimated parameters indicate that young workers previously employed in smaller firms, despite showing not significant re-employment probabilities as a whole, are more likely to be re-employed by atypical contracts than by permanent and fixed-term contracts, possibly suggesting the existence of an association between unstable jobs and previous work in a small firm. Nonetheless, there is evidence in Italy that the use of all forms of atypical work increases with firm size, being considerable for enterprises with more than 50 workers (e.g., Bardazzi and Duranti 2012). The effect we find in our model may also be driven by the fact that most of the sample (approximately 45.7 %; see Table 3 in the Appendix) previously worked in small firms that most likely were the first employment experiences for the youth. For re-employment, the youth most likely also find a job in larger firms and therefore are more likely atypical.

Having experienced illness periods in a previous job-relationship reduces the re-employment probabilities on the whole. This is in line with expectations. However, previous illness periods increase the probability of being re-employed by atypical contracts, possibly suggesting that individuals with health problems experience more difficulties being inserted in a stable job pathway. An alternative explanation for the results related to illness may be illness acting as a signalling effect. Specifically, because illness refers to absenteeism, illness may be a signal of shirking individuals and therefore represent an obstacle to stable/permanent employment.

Interestingly, having gained higher wages in a previous job reduces the probability of being employed with an atypical job relationship. This lowered probability is possibly due to an association between higher wages and characteristics favouring the occupation using permanent and fixed-term contracts (e.g., being a white-collar). Alternatively, because individuals paid more in the previous job may present higher reservation wages, then individuals with a higher reservation wage are less prone to accept an atypical contract job offer, which usually would be characterized by lower wages.

Seven dummy variables control for the role of economic sector specialization concerning re-employment probabilities, keeping manufacturing as the reference category. For the transitions to whole employment, a previous job in the sector of commerce or tourism tends to increase the duration of non-employment spells. With respect to transitions towards AC, we find reduced employment probabilities, especially for the sectors of tourism and transport (and the residual category for other sectors). In particular, the finding concerning the tourism sector (in line with the finding for overall employment, Table 1) would depend upon the presence of foreign-born workers in this sector. The ILO and the OECD (2011) estimated that the high seasonality of tourism and its employment peaks combined with increasing labour shortages mean that growing numbers of employees in the tourism sector are migrant workers, thus increasing the importance of the informal economy in the Italian tourism sector. As a result, the informal economy reduces the opportunities of employment for young people, particularly atypical employment, due to the seasonality of tourism. With respect to NE-PC transitions, only previous experience in the economic sector of commerce increases the length of non-employment spells.

Cumulated job experience in PC exerts a positive role on re-employment as a whole and with the same contractual form, whereas such experience decreases the likelihood of atypical employment, which is in line with expectations. The cumulated experience in AC instead exerts a positive role on re-employment probabilities as a whole and with both permanent/fixed-term and atypical contracts.

Finally, we find that the expected employment growth variable has a positive and significant effect on re-employment probabilities, and both with PC and AC. Interestingly, a relatively greater effect is found for NE-AC compared with NE-PC transitions.

## 6 The evolution of re-employment probabilities: interpretations

The aim of this section is twofold. First, we provide an analysis trying to disentangle the contribution of different competing causes of the evolution of re-employment probabilities of young Italian individuals in 1985–2004. Second, we focus on the role of labour policies and/or labour market institutions, by investigating the evolution of re-employment probabilities by subgroups, and paying attention to gender, territorial and occupational imbalances.

Although homogeneity of the time series is a nice property, permitting straightforward forecasting and for this reason occasionally assumed in the literature (e.g., Cook et al. 2002), we expect the probabilities of exiting non-employment over a 1-year period to be non-homogeneous over the 20-year time span considered in the analysis (1985–2004). We identify four main causes for this non-homogeneity: (1) the effects of the business cycle (BC), (2) changes in the workforce composition (WC), (3) structural changes in the labour market (SC), and (4) changes in labour policies (and/or labour market institutions).

The mentioned causes would not be fully exhaustive when identifying factors guiding the evolution of re-employment probabilities. For example, changes in social preferences and/or culture related to labour market participation are not directly taken into account. On the one side, this potentially bias the contribution of selected factors and, then, their interpretation should be cautious. On the other side, our results would be suggestive of a trend. In addition, the mentioned bias would be potentially mitigated once unobserved heterogeneity is controlled for, as provided for by our estimation model.

### 6.1 Possible causes

Focusing on our first analysis, the strategy consists of estimating alternative specifications of the discrete time-hazard model in which, step by step, we add control variables related to a specific cause.[24]

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[24] In this regard, Fig. 8 in Appendix reports a graphical representation of estimated coefficients, for the whole sample, and for sub-analysis of exits by permanent and fixed-term contracts and atypical contracts, respectively.

We approximate the effect of the business cycle by including the expected (next quarter) employment growth rate. Second, the time-varying nature of our covariates allows us to capture the changes in workforce composition over the period analysed here. Third, controlling for the role of different cohorts and interacting them with relevant characteristics, i.e., gender, geographical area and sector of economic activity, would be helpful to capture effects related to structural changes in the labour market. Once these contributions have been considered, time-dummy variables would approximate the contribution of labour policies and/or labour market institutions (and the role of residual uncontrolled factors) to the evolution of the hazard rate.

The first specification (raw), only controls for time-dummy variables; therefore, the related estimated coefficients would be indicative of the (raw) evolution of the hazard rate with respect to the base-category year (i.e., 1985), and they are represented by the continuous black lines in Fig. 8 in Appendix. The second specification (raw + BC), controls for time-dummy variables and the business cycle. Therefore, the estimated coefficients of the time-dummy variables would be representative of the change in the hazard rate once the effect of business cycle has been controlled for. This is represented by the dotted black lines in Fig. 8 in Appendix. The third specification (raw + BC + WC), controls for time-dummy variables, business cycle and individual and job-related covariates (representing the workforce composition). In this case, the estimated coefficients of the time-dummy variables would represent the change in the hazard rate once the effects of business cycle and workforce composition have been controlled for. This is represented by the dotted grey lines in Fig. 8 in Appendix. Finally, the fourth specification (raw + BC + WC + SC), controls for time-dummy variables, business cycle, individual and job-related covariates and cohort-dummy variables interacted with relevant covariates (possibly capturing structural changes in the labour market). In this case, the estimated coefficients of the time-dummy variables, would be representative of the changes in the hazard rate, once the effects of business cycle, workforce composition and structural changes have been controlled for. This is represented by the continuous grey lines in Fig. 8 in Appendix.

Therefore, the differences among plotted lines would be interpretable in terms of contributions of different causes to the evolution of hazard rates. In addition, the residual pattern (the grey continuous lines) would have been guided by labour market policies/institutions and residual unobserved heterogeneity.

Looking at the whole sample analysis, conditionally to 1985, the raw hazard rate followed a slightly inverted U-shaped form between 1986 and 1991, and then dropped in 1992. Since 1993, it steadily increased, and then accelerated after 1996 and, especially, after 2003.

The year-by-year difference between the continuous and the dotted black lines, would be indicative of the contribution of the business cycle to the evolution of the hazard rate. According to this interpretation, the business cycle not contributed in the late '80s, while negatively contributed to the hazard rate evolution between 1991 and 1993, consistently with the 1993 recession and related anticipated crisis effects. We also find a positive contribution of the business cycle since 1998 to 2004. The year-by-year difference between the dotted black and gray lines would be suggestive of the contribution of the workforce composition. Looking at the whole sample, its contribution was positive and relatively constant over the investigated

period. The year-by-year difference between the continuous and the dotted gray lines, would be indicative of the contribution of structural changes in the labour market. According to the whole sample analysis, its contribution was positive and increasing since early '90s' but disappeared during '00s'. Finally, the contribution of labour policies and/or institutional changes and residual unobserved heterogeneity was negative during '90s' but became positive after the introduction of the Treu reform in 1997, and strongly positive since '00s'.

When splitting the sample by exit contract, some relevant differences emerge. For example, the contribution of the business cycle has been relatively greater for individuals leaving non-employment by atypical contracts, consistently with theoretical predictions, for which atypical employment is more reactive to business cycle fluctuations than permanent employment. The role of workforce composition was positive and greater for individual being re-employed by permanent and fixed-term contracts, while it was negative or slightly positive for those leaving non-employment by atypical contracts. The contribution of structural changes was relatively more important for individuals leaving non-employment by atypical contracts, at least during '90s'. Finally, the contribution of labour policies and/or institutional changes (and residual unobserved heterogeneity) was much more important for individuals leaving non-employment by atypical contracts.

### 6.2 Residual heterogeneity: a decomposition by gender, territory and occupation

Our second analysis deeps the role of legislative changes in the labour market in affecting the re-employment probabilities of young Italian workers. Specifically, we decompose the residual year-to-year dynamics by relevant subgroups, namely gender-territorial sub-groups and occupational sub-groups (Figs. 9, 10 in Appendix).[25] This seems particularly relevant, as our findings also suggest the presence of gender, geographical and occupational differentials.

In the Sect. 5.1, we presented the findings for the hazard rates by gender and geographical area estimated by using the WHIP panel data for 1985–2004. In modelling employment opportunities, we introduced individual characteristics, assuming their effect constant through the 20-year period, we controlled for structural changes, and we considered the effects of the cycle by using as structural indicator the expected employment growth. Moreover, we included yearly dummy variables to model the residual variation in transition probabilities. In this sub-section, we assess these residual year effects are significant and interpret them in the light of major policy intervention in the labour market. Figures 9 and 10 in Appendix display the pattern of the residual variation of the hazard rates with respect to the whole sample and to PC and AC.

First, we investigate the presence of time-homogeneous hazard rates by calculating a simple $t$ test for the difference between the coefficients of each yearly dummy variable and the dummy for the base year (1985). A dot on the series

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[25] Graphically, this analysis decomposes by sub-groups the continuous gray lines of the first analysis in Fig. 8 in Appendix.

in Figs. 9 and 10 in Appendix indicates where the behaviour differs significantly from the base year.[26]

Looking at Fig. 9 in Appendix, we argue that differences in the evolution of re-employment probabilities because of labour market institutions, has been relatively homogenous across gender-territorial sub-groups. We find some exceptions for Southern male individuals during mid '90s' and, especially, during '00s'. In that years, it seems legislative changes has contributed to reduce the territorial employment gap, by increasing re-employment opportunities especially for Southern individuals. When deepening the analysis, distinguishing by exit-contract, we note that '00s' has been characterized by a relatively small increase in re-employment probabilities by permanent and fixed-term contracts for individuals living in Northern regions. Looking at Fig. 10 in Appendix, we focus on the role of occupation. We note that during '90s', at least before the introduction of the "Treu Package", the re-employment probabilities of white collars has been negatively affected by labour market institutions and policies. The analysis by exit-contract, clarifies this negative pattern has been particularly determined by the performance related to re-employment probabilities by permanent and fixed-term contracts. Finally, legislative changes in the labour market, especially increased the re-employment probabilities by atypical contracts for both blue and white collars.

The increase of atypical re-employment (Fig. 10 in Appendix) might also be partly due to the great increase of atypical employment contracts introduced in 1993 by "The Protocollo sulla politica dei redditi e dell'occupazione, sugli assetti contrattuali, sulle politiche del lavoro e sul sostegno al sistema produttivo" mentioned in Sect. 2, and subsequently (in 1997) by the "Treu Package". The share of temporary employment in total employment in fact increased throughout the period analysed, especially for young people. The percentage of the total labour force on temporary contracts increased from 4.8 % in 1985 to 8.2 % in 1997 (the year of the Treu Package). At the end of the period, the percentage was approximately 11.8 %. The corresponding share for the young in the 15–24 age range increased from approximately 9.5 % in 1985 to approximately 18.8 % in 1997, and at the end of the period (2004), more than one-third of the young (approximately 34.6 %) were employed on temporary contracts (OECD Statistics 2013).

These tendencies might also be determined by technological and organizational changes facilitating access to jobs for a higher number of individuals. The effects of these forces might indeed confound the relevance of the aforementioned reforms (see Sect. 2) because the latter had already been introduced. The overall behaviour of the hazards confirms the tendency towards increased employment stability. The bulk of employment, therefore, is largely determined by increased permanence in this state and not by increased employment opportunities for disadvantaged categories. The opportunities offered to disadvantaged workers, such as the long-term unemployed, were indeed atypical and temporary contracts, possibly signalling

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[26] In addition, by running equality tests between the coefficients of our yearly binary variables, we find absence of time-homogeneous probabilities of exiting non-employment, for both genders and geographical areas. These results are available upon request.

a lack of efficacy of the legislation of the last three decades in increasing permanent employment opportunities for young people.[27] Finally, the currency (and financial) crisis at the beginning of the nineties also represented an obstacle to enhanced employment opportunities.

### 6.3 Discussion

A major finding of our analysis is that the re-employment probabilities of young Italian people in the analyzed period, fluctuated until mid '90s', and then raised, at an increasing rate, since the second half of '90s'.

The first analysis, aimed at identifying the contribution to this pattern of different causes, suggests the promotion of legislative changes in the labor market has possibly been a major driver of that evolution. The sub-sample analysis, clarifies the increase in employment opportunities has been mainly guided by the increasing use of atypical contracts, even though employment opportunities by permanent and fixed-term contracts has also increased since late '90s'.

Our first analysis also reveals a positive contribution of changes in workforce composition for re-employment probabilities by permanent and fixed-term contracts. This would be suggestive of an increasing relevance of characteristics to favour re-employment probabilities by a permanent or fixed-term contracts. A possible interpretation of this finding is that an individual with better characteristics has been increasingly selected into permanent and fixed-term contracts, once the use of atypical contracts has become more widespread. Finally, a positive contribution for being reemployed by atypical contracts has been determined by structural changes in the labour market. Among others, this is possibly indicating the greater participation of young females to the labour market has been mainly guided by atypical employment.

The second analysis deeps the role of legislative changes in the labour market, by decomposing re-employment trends by gender, territory and profession. This clarifies the greater re-employment probabilities since late '90s' has partly contributed to reduce the territorial gap, and that Southern young people has especially benefitted by an increase in re-employment probabilities by permanent and fixed-term contracts. In addition, the analysis by occupation shows a relatively greater impact of the wider use of atypical contracts for white collars, especially after the implementation of reforms "at the margin".

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[27] To provide evidence on the increase in employment opportunities for disadvantaged or blue-collar workers, we re-estimated our models by occupational classification, i.e., blue-collar and white-collar (according to the International Standard Classification of Occupations, ISCO-88). Although the hazards to AC (both blue and white collars) are lower compared with the hazards to PC through the overall period (Fig. 6 in Appendix), the re-employment probabilities with AC contracts, especially for blue-collars, were mostly affected by the changes of the period, both institutional and due to economic facts (Fig. 10 in Appendix).

## 7 Conclusions

This paper investigates the evolution of re-employment probabilities of young people aged 15–24 in Italy in 1985–2004. The empirical analysis is based on WHIP data and discrete time-hazard models with unobserved heterogeneity and competing risks, allowing us to distinguish between employment with permanent and fixed-term contracts and atypical contracts, beyond the analysis for overall employment. Through the period examined, the Italian labour market went through relevant reforms, business-cycle fluctuation, changes in labour force composition, and structural changes. These developments are likely to have affected the labour market perspectives of young people.

Our main finding is an increase in employment opportunities since the second half of the 1990s for young people. The rise was especially relevant for atypical contracts. In addition, whereas the evolution of re-employment probabilities by atypical contracts could be largely explained by labour policies/institutional changes (and unobserved residual heterogeneity), the explanation for permanent and fixed-term contracts is more mixed. In particular, changes in the workforce composition, and possibly a selection of "good" workers in permanent contracts, significantly contribute to explain the evolution of re-employment probabilities by permanent contracts. In this context, territorial and gender differences emerge, particularly concerning the role of labour policies and institutional changes.

However, the overall behaviour of the hazards confirms the tendency towards increased employment stability. The bulk of employment, therefore, is largely determined by increased permanence in this state and not by increased employment opportunities for disadvantaged categories (e.g., blue-collar workers). The opportunities offered to disadvantaged workers were indeed primarily atypical and temporary contracts and therefore did not imply a stable and permanent increase of the bulk of young employed.

Finally, to enhance the labour market perspectives of young people, introducing policies aimed at increasing their labour force participation and, in particular, at enhancing their employability in permanent contracts is necessary. The policies might be aimed at helping young people to find sustainable employment jobs and to increase their long-term employability by offering a number of options for those young people who do not find a job, such as periods of full-time education or training and work experience through job placements and subsidised employment. Thus, our findings have implications for how educational and training systems can be planned and structured to achieve a better match between education/training and employment.

## Appendix

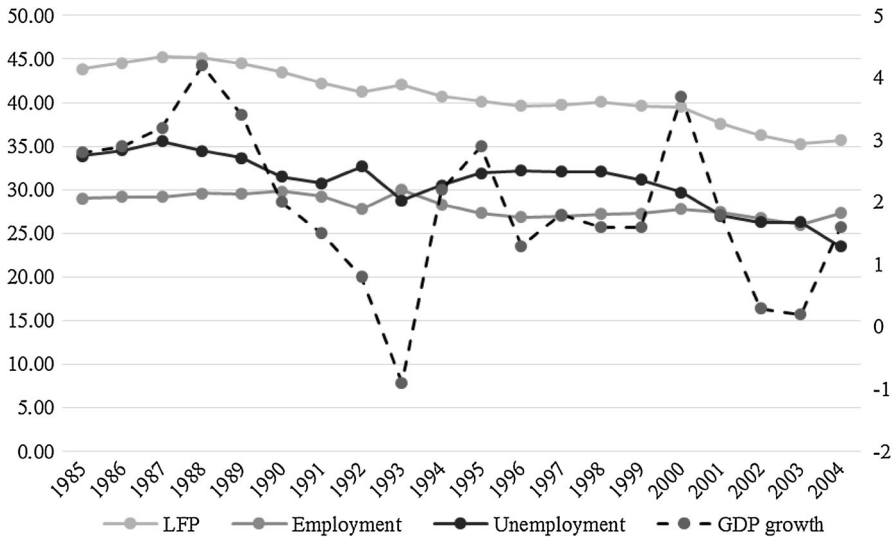See Figs. 2, 3, 4, 5, 6, 7, 8, 9, 10 and Tables 2, 3, 4.

**Fig. 2** GDP growth and the Italian labour market in 1985–2004. Source: OECD statistics (2013)
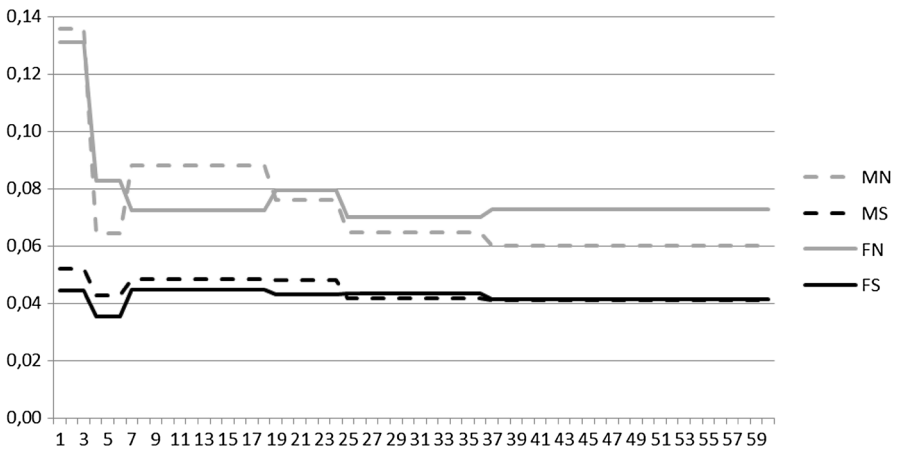


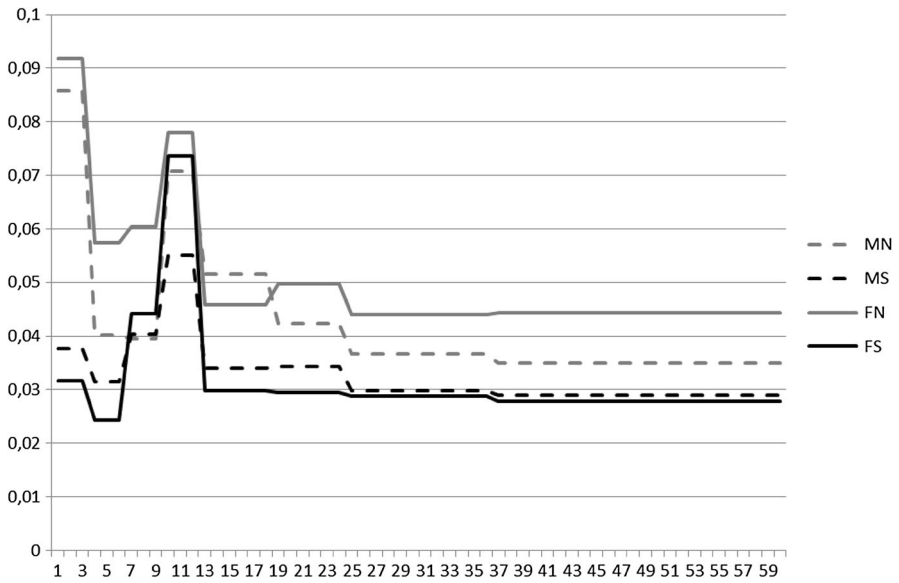**Fig. 3** Hazard rates to overall employment by gender and geographical area

**Fig. 4** Hazard rates to PC by gender and geographical area. Source: our elaborations on WHIP data
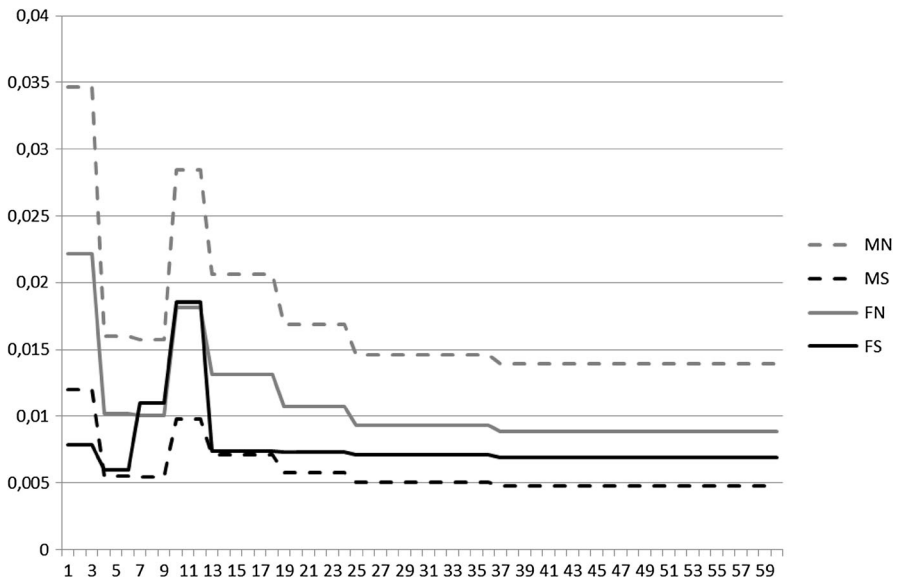


**Fig. 5** Hazard rates to AC by gender and geographical area. Source: our elaborations on WHIP data
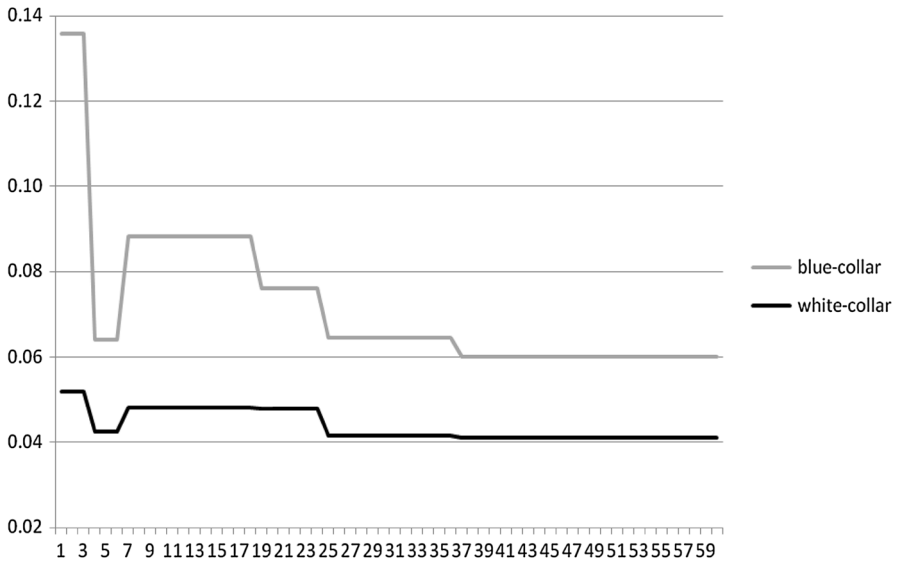
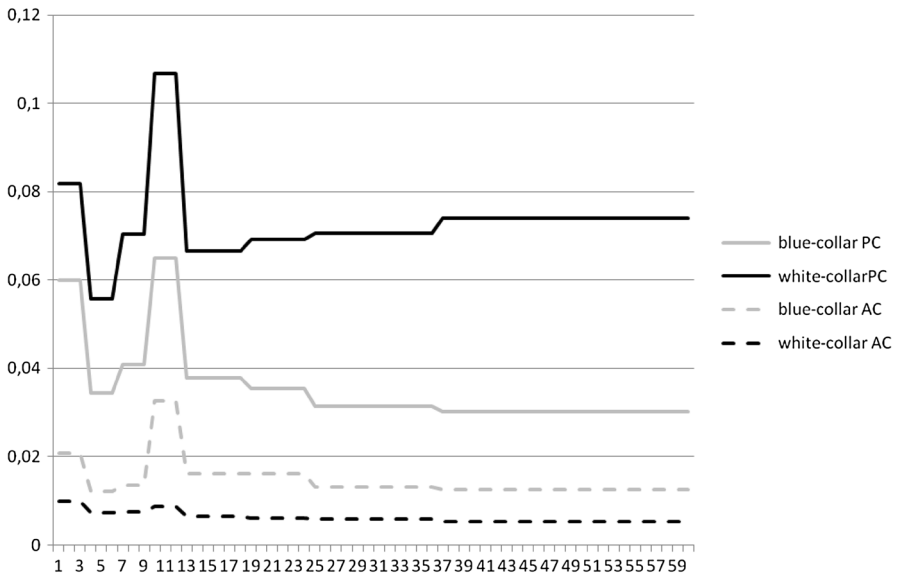**Fig. 6** Hazard rates by occupation, overall employment
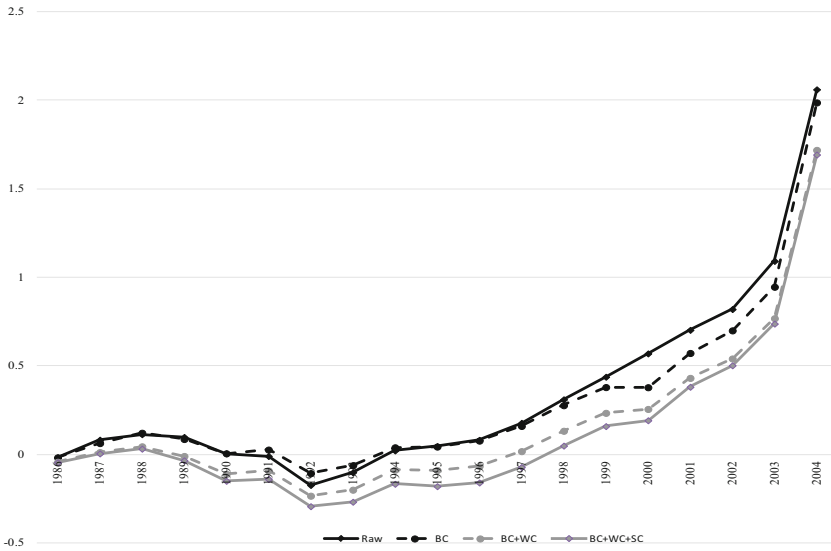


**Fig. 7** Hazard rates by occupation and contract type. Source: our elaborations on WHIP data

Overall employment



Permanent and Fixed- Term contracts
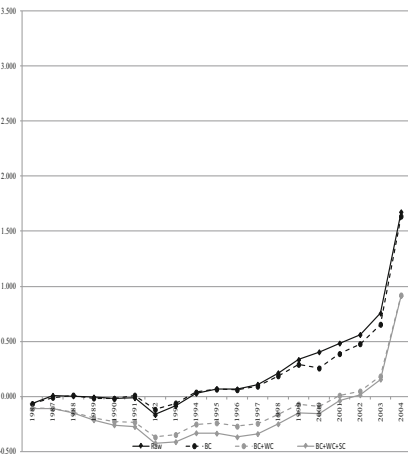


Atypical contracts



**Fig. 8** Step-by-step analysis, graphical representation of estimated coefficients, over the period 1985–2004 (1985, base). Source: our elaborations on WHIP data
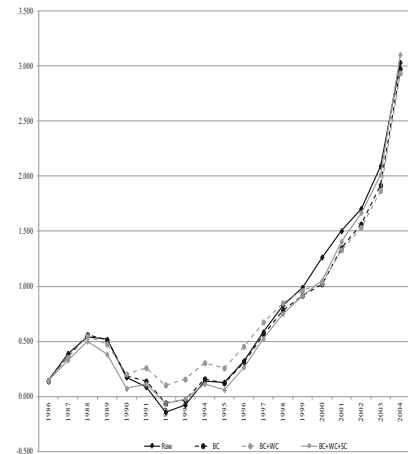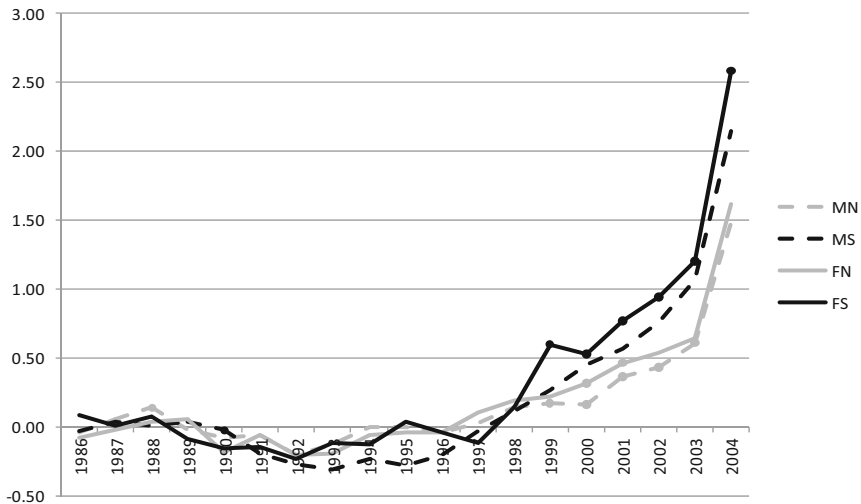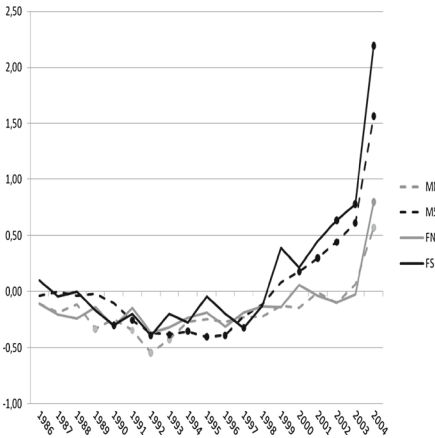
Overall employment



Permanent and Fixed-Term contracts
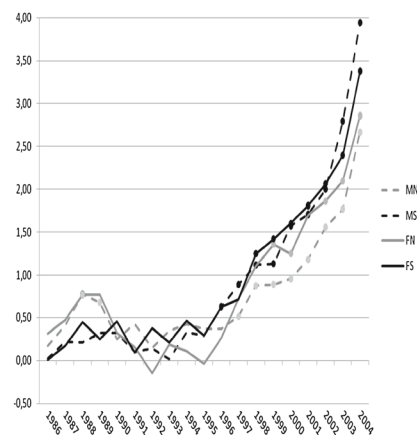
Atypical contracts





**Fig. 9** Residual year-to-year dynamics by gender and geographical area over the period 1985–2004 (1985, base). Source: our elaborations on WHIP data

Whole sample                              Permanent/Fixed-Term and Atipical contracts
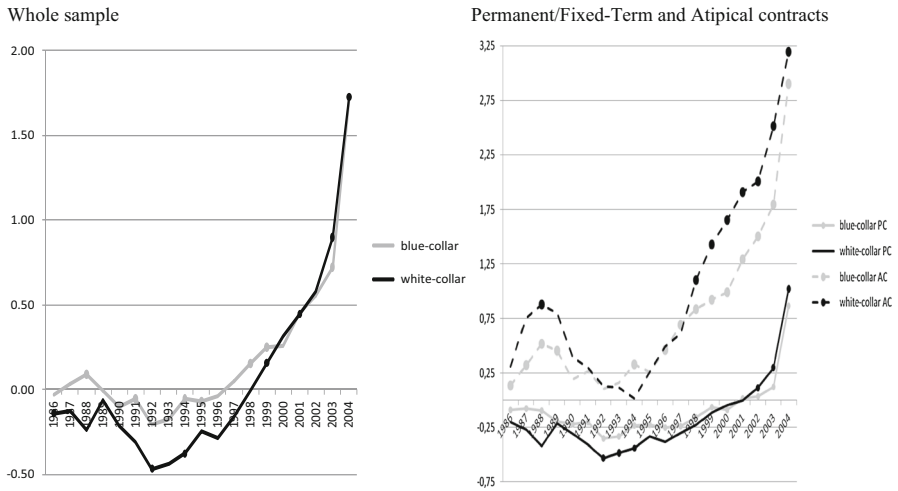


**Fig. 10** Residual year-to-year dynamics by occupation over the period 1985–2004 (1985, base). Source: our elaborations on WHIP data

**Table 2** EPL in some EU and OECD countries

|           | Permanent and fixed-term contracts | | | | | Atypical contracts | | | | |
|-----------|------|------|------|------|------|------|------|------|------|------|
|           | 1985 | 1990 | 1995 | 2000 | 2004 | 1985 | 1990 | 1995 | 2000 | 2004 |
| Australia | 1.17 | 1.17 | 1.17 | 1.42 | 1.42 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Canada    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| France    | 2.59 | 2.34 | 2.34 | 2.34 | 2.47 | 3.06 | 3.06 | 3.63 | 3.63 | 3.63 |
| Germany   | 2.58 | 2.58 | 2.68 | 2.68 | 2.68 | 5.00 | 3.25 | 3.13 | 2.00 | 1.00 |
| Italy     | 2.76 | 2.76 | 2.76 | 2.76 | 2.76 | 5.25 | 4.88 | 4.75 | 3.25 | 2.00 |
| Spain     | 3.55 | 3.55 | 2.36 | 2.36 | 2.36 | 3.75 | 3.75 | 3.25 | 3.25 | 3.25 |
| UK        | 1.10 | 1.10 | 1.10 | 1.26 | 1.26 | 0.25 | 0.25 | 0.25 | 0.25 | 0.38 |
| US        | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |

Source: OECD data

**Table 3** Description of variables and summary statistics by gender and total, 1985–2004

| Variables | Variable description | Male | | Female | | All | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | Mean | Std Dev. | Mean | Std Dev. | Mean | Std Dev. |
| Age | Age (years) | 20.618 | 2.371 | 20.935 | 2.233 | 20.737 | 2.325 |
| Male | =1 if male, 0 otherwise | – | – | – | – | 0.624 | 0.484 |
| Geographical area of residence | | | | | | | |
| North–west | =1 if residing in north-west of Italy | 0.276 | 0.447 | 0.301 | 0.458 | 0.285 | 0.452 |
| North–east | =1 if residing in north-east of Italy | 0.283 | 0.450 | 0.372 | 0.483 | 0.316 | 0.465 |
| Centre | =1 if residing in centre of Italy | 0.176 | 0.381 | 0.182 | 0.386 | 0.178 | 0.383 |
| South–Islands | =1 if residing in South-Islands of Italy | 0.265 | 0.441 | 0.146 | 0.353 | 0.220 | 0.415 |
| Blue collars | =1 if blue-collar, 0 if white-collar[a] | 0909 | 0.288 | 0.713 | 0.452 | 0.835 | 0.371 |
| Firm size (# employee) | | | | | | | |
| Firm size missing | =1 if firm size is missing | 0.083 | 0.276 | 0.075 | 0.263 | 0.080 | 0.271 |
| Firm size 1–9 | =1 for firm size from 1 to 9 employees | 0.455 | 0.498 | 0.460 | 0.498 | 0.457 | 0.498 |
| Firm size 10–19 | =1 if firm size from 10 to 19 employees | 0.148 | 0.355 | 0.146 | 0.353 | 0.147 | 0.354 |
| Firm size 20–199 | =1 for firm size from 20 to 199 employees | 0.221 | 0.415 | 0.207 | 0.405 | 0.216 | 0.412 |
| Firm size 200 and more | =1 for firm size 200 employees and over | 0.092 | 0.289 | 0.113 | 0.316 | 0.100 | 0.300 |
| Illness | =1 if the individual received illness benefit during the year | 0.065 | 0.247 | 0.053 | 0.224 | 0.061 | 0.239 |
| Wage | Yearly gross wage | 40.408 | 29.275 | 40.969 | 37.755 | 40.619 | 32.722 |
| Sector of economic activity of the last employment experience of the individual | | | | | | | |
| Manufacturing[b] | =1 if the individual previously employed in manufacturing | 0.355 | 0.479 | 0.310 | 0.462 | 0.338 | 0.473 |
| Building | =1 if the individual previously employed in building | 0.207 | 0.405 | 0.010 | 0.101 | 0.133 | 0.339 |
| Commerce | =1 if the individual previously employed in commerce | 0.112 | 0.316 | 0.155 | 0.362 | 0.128 | 0.334 |
| Tourism | =1 if the individual previously employed in tourism | 0.142 | 0.349 | 0.208 | 0.406 | 0.167 | 0.373 |
| Transport | =1 if the individual previously employed in transport | 0.036 | 0.187 | 0.016 | 0.124 | 0.028 | 0.166 |
| Business-intermediation | =1 if the individual previously employed in business-intermediations | 0.069 | 0.253 | 0.114 | 0.318 | 0.086 | 0.280 |

**Table 3** continued

| Variables | Variable description | Male | | Female | | All | |
|---|---|---|---|---|---|---|---|
| | | Mean | Std Dev. | Mean | Std Dev. | Mean | Std Dev. |
| Other sectors | =1 if the individual previously employed in other sectors | 0.079 | 0.270 | 0.187 | 0.390 | 0.120 | 0.325 |
| Cumulated employment experience in PC or TC (months) | | | | | | | |
| Cumulated PC experience | Cumulated PC experience in the last job (months) | 7.943 | 13.473 | 9.189 | 15.109 | 8.412 | 14.123 |
| Cumulated TC experience | Cumulated TC experience in the last job (months) | 6.301 | 10.804 | 5.350 | 10.139 | 5.943 | 10.569 |
| Expected employment growth | expected (next quarter) employment growth rate by area and year | 0.128 | 1.586 | 0.120 | 1.628 | 0.125 | 1.602 |
| Cohort dummy variables | | | | | | | |
| Cohort 1961–1970 | Individuals born in the period 1961–1970 | 0.419 | 0.493 | 0.460 | 0.498 | 0.434 | 0.496 |
| Cohort 1971–1980 | Individuals born in the period 1971–1980 | 0.500 | 0.500 | 0.477 | 0.499 | 0.492 | 0.499 |
| Cohort 1981–1988 | Individuals born in the period 1981–1988 | 0.081 | 0.272 | 0.063 | 0.243 | 0.074 | 0.261 |
| Spells | | 47929 | | 28870 | | 76799 | |

Source: our elaborations on WHIP data

[a] Blue-collar and white collar are defined according to the International Standard Classification of Occupations, ISCO-88

[b] Sectors of economic activity classified according to the Ateco91 classification

**Table 4** Random effects cloglog coefficient estimates: cohort trends by gender, geographical area and sector of economic activity, 1985–2004

| | Overall Employment | | Permanent Contract | | Atypical Contract | |
|---|---|---|---|---|---|---|
| | Coeff. | SE | Coeff. | SE | Coeff. | SE |
| Cohort 1971–1980 | 0.103 | 0.045* | 0.155 | 0.052*** | 0.081 | 0.091 |
| Cohort 1971–1980 × male | −0.130 | 0.025*** | −0.135 | 0.029*** | −0.149 | 0.046*** |
| Cohort 1971–1980 × north–west | −0.011 | 0.033 | 0.023 | 0.038 | −0.102 | 0.060* |
| Cohort 1971–1980 × north–east | −0.014 | 0.033 | −0.010 | 0.038 | −0.064 | 0.059 |
| Cohort 1971–1980 × South-Islands | −0.057 | 0.034* | −0.040 | 0.039 | 0.275 | 0.071*** |
| Cohort 1971–1980 × blue-collar | 0.162 | 0.030*** | 0.090 | 0.034*** | 0.221 | 0.067*** |
| Cohort 1971–1980 × construction | −0.120 | 0.034*** | −0.159 | 0.039*** | 0.111 | 0.066* |
| Cohort 1971–1980 × commerce | 0.015 | 0.034 | −0.032 | 0.039 | 0.088 | 0.062 |
| Cohort 1971–1980 × tourism | −0.086 | 0.033*** | −0.051 | 0.038 | 0.087 | 0.064 |
| Cohort 1971–1980 × transport | −0.061 | 0.063 | −0.028 | 0.069 | 0.166 | 0.155 |
| Cohort 1971–1980 × intermediation-business | 0.009 | 0.043 | 0.032 | 0.049 | 0.016 | 0.090 |
| Cohort 1971–1980 × other sectors | 0.003 | 0.035 | 0.014 | 0.040 | 0.101 | 0.075 |
| Cohort 1981–1988 | −0.061 | 0.080 | −0.056 | 0.102 | −0.260 | 0.126** |
| Cohort 1981–1988 × male | −0.195 | 0.039*** | −0.066 | 0.050 | −0.340 | 0.057*** |
| Cohort 1981–1988 × north–west | 0.021 | 0.051 | −0.106 | 0.067 | 0.169 | 0.075** |
| Cohort 1981–1988 × north–east | −0.055 | 0.050 | −0.158 | 0.066** | −0.002 | 0.074 |
| Cohort 1981–1988 × South-Islands | 0.238 | 0.055*** | 0.403 | 0.070*** | 0.640 | 0.089*** |
| Cohort 1981–1988 × blue-collar | 0.161 | 0.055*** | −0.028 | 0.069 | 0.000 | 0.090 |
| Cohort 1981–1988 × construction | −0.048 | 0.052 | −0.105 | 0.071 | 0.193 | 0.079** |
| Cohort 1981–1988 × commerce | 0.066 | 0.052 | 0.026 | 0.072 | 0.090 | 0.076 |
| Cohort 1981–1988 × tourism | −0.097 | 0.048* | 0.160 | 0.062*** | 0.028 | 0.076 |
| Cohort 1981–1988 × transport | 0.018 | 0.101 | 0.402 | 0.119*** | 0.025 | 0.198 |
| Cohort 1981–1988 × intermediation-business | 0.129 | 0.057* | 0.325 | 0.072*** | 0.093 | 0.098 |
| Cohort 1981–1988 × other sectors | 0.050 | 0.067 | 0.045 | 0.092 | 0.296 | 0.099*** |

Source: our elaborations of WHIP data

* Significant at the 10 % level; ** significant at the 5 % level; *** significant at the 1 % level

# References

Acocella, N., & Leoni, R. (2007). *Social pacts, employment and growth. Reappraisal of Ezio Tarantelli's thought*. Heidelberg: Springer.

Addison, J. T, Centeno, M., & Portugal, P. (2004). Reservation wages, search duration and accepted wages in Europe. Discussion Paper No. 1252, IZA, Bonn.

Azmat, G., Guell, M., & Manning, A. (2006). Gender gaps in unemployment rates in OECD countries. *Journal of Labor Economics, 24*(1), 1–37.

Bardazzi, R., & Duranti, S. (2012). 'Atypical contracts and Italian firms' labour productivity', mimeo, presented at the AIEL Conference of Labour Economists in 2012.

Becker S., Bentolila S., Fernandes A., & Ichino, A. (2004). Job Insecurity and Children's Emancipation. *CESifo Working Paper* Series No. 1144, CESifo Group Munich.

Bentolila, S., Cahuc, P., Dolado, J., & Le Barbanchon, T. (2012). Two-tier labour markets in the great recession: France Versus Spain. *The Economic Journal, 122*(562), F155–F187.

Bentolila, S., & Dolado, J. (1994). Labour flexibility and wages: lessons from Spain'. *Economic Policy, 9*(18), 53–99.

Bertola, G., & Garibaldi, P. (2003). The structure and history of Italian Unemployment. *CESifo Working Paper* Series No. 907.

Berton, F., Devicienti, F., & Pacelli, L. (2011). Are temporary jobs a port of entry into permanent employment? Evidence from matched employer-employee. *International Journal of Manpower., 32*(8), 879–899.

Blanchard, O., & Landier, A. (2002). The perverse effects of partial labour market reform: fixed-term contracts in France. *The Economic Journal, 112*(480), F214–F244.

Boeri, T., & Garibaldi, P. (2007). Two tier reforms of employment protection: a honeymoon effect. *The Economic Journal, 117*, F357–F385.

Booth, A., Francesconi, M., & Frank, J. (2002). Temporary jobs: stepping stones or dead-ends? *The Economic Journal, 112*, F189–F213.

Cappellari, L., Dell'Aringa, C., & Leonardi, M. (2012). Temporary employment Job flows and productivity: a tale of two reforms. *The Economic Journal, 122*(562), F188–F215.

Casadio, P. (2003). Wage formation in the Italian private sector after the 1992–93 income policy agreements. In J. Morgan, G. Fagan, & P. Mongelli (Eds.), *Institutions and wage formation in the New Europe*. Cheltenham: Edward Elgar Publishing Ltd.

Contini, B., & Grand, E. (2010). Disposable Workforce in Italy. Institute for the Study of Labor (IZA) Discussion Paper no. 4724, Bonn, Germany.

Contini, B., & Poggi, A. (2012). Employability of young Italian men after a jobless period, 1989–98. *Labour Review of Labour Economics and Industrial Relations, 26*(1), 66–89.

Cook, R. J., Kalbfleisch, J. D., & Grace, Y. Y. (2002). A generalized mover–stayer model for panel data. *Biostatistics, 3*(3), 407–420.

D'Addio, A. C., & Rosholm, M. (2005). Exits from temporary jobs in Europe: a competing risks analysis. *Labour Economics, 12*(4), 449–468.

Dell'Aringa, C., & Lucifora, C. (2000). La "scatola nera" dell'economia italiana: mercato del lavoro, istituzioni, formazione dei salari e disoccupazione. *Rivista di Politica Economica, 3*, 21–70.

Dickson, M., Postel-Vinay, F., & Turon, H. (2014). The lifetime earnings premium in the public sector: the view from Europe. *IZA Discussion Paper* no. 8159.

Gagliarducci, S. (2005). The dynamics of repeated temporary jobs. *Labour Economics, 12*(4), 429–448.

Grand, E. & Quaranta, M. (2011). Completamento delle carriere lavorative WHIP con i dati del Casellario degli Attivi INPS. WHIP Technical Report no. 3/2011, Labor Laboratorio Riccardo Revelli, Centre for Employment Studies.

Howell, D., Baker, D., Glyn, A., & Schmitt, J. (2006). Are protective labor market institutions really at the root of unemployment? A critical perspective on the statistical evidence. WP 2006–14, Center for Economic and Policy Research.

Güell, M., & Petrongolo, B. (2007). How binding are legal limits? Transitions from temporary to permanent work in Spain. *Labour Economics, 14*(2), 153–183.

Ichino, A., Mealli, F., & Nannicini, T. (2005). Temporary work agencies in Italy: a springboard to permanent employment? *Giornale degli Economisti e Annali di Economia., 64*(1), 1–27.

ISTAT. (2004). *Forze di lavoro—Media 2003*. Roma: Istat.

Jenkins, S. (2005). Survival analysis. Unpublished manuscript. University of Essex.

Krugman, P. (1996). Are currency crises self-fulfilling? *NBER Macroeconomics Annual*.

Kugler, A., & Pica, G. (2008). Effects of employment protection on worker and job flows: evidence from the 1990 Italian Reform. *Labour Economics, 15*(1), 78–95.

LABORatorio Revelli (2009) WHIP Data House. http://www.laboratoriorevelli.it/whip/.

Lazear, E. P. (1990). Job security provisions and employment. *Quarterly Journal of Economics, 105*(3), 699–726.

Leonardi, M., & Pica, G. (2013). 'Who pays for it? The heterogeneous wage effects of employment protection legislation. *The Economic Journal, 23*, 1236–1278.

Manacorda, M. (2004). Can the Scala mobile explain the fall and rise of earnings inequality in Italy? A semiparametric analysis, 1977–1993. *Journal of Labor Economics, 22*(3), 585–613.

Montanino, A., & Sestito, P. (2003). Le molte funzioni del lavoro interinale in Italia: da strumento di flessibilità a contratto di prova. *Rivista di Politica Economica., 93*(3–4), 115–148.

Mussida, C., & Sciulli, D. (2015). Flexibility policies and re-employment probabilities in Italy. *BE J Econ Anal Policy, 15*(2), 621–651.

Narendranathan, W., & Stewart, M. (1993). Modelling the probability of leaving unemployment: competing risks models with flexible baseline hazards. *Applied Statistics, 42*, 63–83.

Nicoletti, C., & Rondinelli, C. (2010). The (mis)specification of discrete time duration models with unobserved heterogeneity: a Monte Carlo study. *Journal of Econometrics, 159*(1), 1–13.

OECD. (2000). *OECD Employment Outlook*. Paris: OECD.

OECD. (2011). OECD studies on tourism: Italy: review of issues and policies. *OECD Publishing,*. doi:10.1787/9789264114258-en.

OECD Statistics (2013). http://stats.oecd.org/.

Ordine, P. (1992). Labour market transitions of prime age Italian unemployed. *Labour Review of Labour Economics and Industrial Relations, 6*(2), 123–143.

Pastore, F. (2010). Assessing the impact of incomes policy: the Italian experience. *Discussion Paper* No. 5082, IZA, Bonn.

Prentice, R. L., & Gloecker, L. A. (1978). Regression analysis of grouped survival data with application to breast cancer data. *Biometrics, 34*(1), 57–67.

Ricciardi, L. (1991). La disoccupazione di lunga durata in Italia: un'analisi dell'evidenza empirica nel periodo 1977–1989. *Economia and Lavoro, 25*(2), 69–94.

Torelli, N., & Trivellato, U. (1989). Youth unemployment duration from the Italian labour force survey: accuracy issues and modelling attempts. *European Economic Review, 33*(2–3), 407–415.

Tronti, L., & Ceccato, F. (2005). Il lavoro atipico in Italia: caratteristiche, diffusione e dinamica. ARGOMENTI, Franco Angeli Editore, vol. 14.