



Associazione Studi e Ricerche  
Interdisciplinari sul Lavoro

**Working Paper n° 21/2016**

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BEGINNING OF THE CAREER: EVIDENCE FROM ITALY**

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Anno 2016

**ISSN 2280 – 6229 -Working Papers - on line**

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esemplare fuori commercio  
ai sensi della legge 14 aprile 2004 n.106

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# **Labour market deregulation and workers' prospects at the beginning of the career: evidence from Italy**

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## **Abstract**

Exploiting an innovative longitudinal individual dataset, we evaluate early career of a sample of Italian workers who attained the tertiary degree between 1998 and 2005 and estimate whether the career patterns changed after the reform that deregulated fixed-term arrangements in 2001. Assuming that the year of graduation is exogenous to the reform, we compare the first six years of the career of those who attained the degree before and after 2001, taking into account short- and medium-term individual outcomes in the labour market. We find that the searching time for the first job reduces for those graduated after 2001, while these individuals start working more frequently through atypical and fixed-term arrangements. Furthermore, those graduated after 2001 worsen their economic condition with respect to the previous cohort as their weekly wages – both at the entry and after six-years– significantly drop. However, no significant differences between the two cohorts along the first phase of the career emerge as concerns yearly working weeks and annual earnings.

## **1. Introduction**

Since the mid of the 1990s up to the mid of the 2000s several labour market reforms were introduced in Italy (in 1995, 1997, 2001, 2003; see Berton et al. 2012) with the main aim of weakening the Employment Protection Legislation (EPL) for new entrants, mostly by easing the chances to hire employees on a temporary basis and introducing and liberalizing atypical contractual arrangements. In particular, a reform that eased the possibility to hire employees through fixed-term contracts was introduced in December 2001 (Decree 368/2001).

According to the proponents, this set of reforms would have shortened the time of entry in the labour market, thus reducing youth unemployment and improving younger workers' prospects. Several studies have investigated whether this set of reforms has created a two-tier labour market in Italy or has represented a port of entry for young workers towards standard contracts. However, also due to data availability, these studies usually considered a limited time span and focused only on a single dimension of the working career, most of all on the type of contractual arrangement at the entry into activity or on the frequencies of upgrade towards open-ended arrangement in the short-term.

In this article, exploiting an innovative longitudinal dataset built merging IT-SILC survey data with the administrative longitudinal records provided by the Italian Social Security Institute (INPS), we evaluate in a longer time span the working histories of the cohorts of individuals who entered the labour market since the start of the reforming process. We focus on several individual outcomes during the first six-year of the career: i.e., duration of the searching time, first contractual arrangement, entry wages and – along the six-year period – working weeks, weekly wages and annual earnings.

In particular, we aim at evaluating whether the increase in labour market flexibility realized in 2001 has been associated to a change in workers' economic conditions. To this aim we compare – by means of econometric estimates and controlling for business cycle and several individual's and firm's covariates – the starting working histories of individuals with the same level of education, who entered in the labour market when the reform process that started in the '90s had already begun, but who differ because the youngest have entered the labour market after the further liberalizing reform introduced at the end of 2001.

We constrain our analysis to those who attained a tertiary degree in the 1998-2005 period. Thus, in order to evaluate a possible influence of the 2001 reform, we distinguish two cohorts of tertiary graduates – those who attained the degree, respectively, in the 1998-2001 period and in the 2002-2005 period – and estimate whether the career pattern in the six-year period after the graduation changed across cohorts.

Focusing on tertiary graduates allows us to distinguish individuals according to the year when they attained their highest degree and stopped to study, i.e. according to an individual feature that we can assume to be exogenous to the reform. Thus, the information on the tertiary graduation year allows us to distinguish those individuals less or more exposed to the reform, i.e. those who became active before or after the end of 2001. Conversely, as explained in Section 4, available data prevent us from distinguishing two cohorts of lower and upper secondary educated according to a characteristic exogenous to the reform.

Anyhow, inquiring the case of tertiary graduates is crucial due to some peculiarities of the Italian labour market. Despite of a slight increase over the last decades, the share of tertiary graduates in Italy is still much lower than the EU-28 average (according to Eurostat data, in 2014 the share of tertiary graduates among those aged 25-39 was 22.9% in Italy and 36.7% in EU-28). Therefore, according to a labour demand-supply argument linked to the diffusion of a skill biased technological change, which suggests that the new technology should foster the demand for high-skilled workers more than its supply (Katz and Autor 1999), we should expect that the relative scarcity of skilled workforce has improved tertiary graduates prospects. On the contrary, as found by Naticchioni et al. (2016), compared to those born in previous years, tertiary graduates born after 1975 have suffered in Italy an earnings penalty at the beginning of the career much more severe than that experienced by those holding a lower education.

Our analysis differs from other studies on similar issues because our empirical strategy is not based on a comparison of outcomes of individuals that started to work through different types of contracts, but, as mentioned, it is based on comparing the outcomes of individuals who belong to two cohorts differently exposed to labour market deregulation. We find that the searching time for the first job reduces for those graduated after 2001 and that these individuals more frequently start to work through atypical and fixed-term arrangements. However, the most original result is that those graduated since 2002 worsen their condition with respect to the previous cohort, as their weekly wages – both at the entry and during the six-year period – significantly drop. Gaps between the two cohorts of tertiary graduates, disadvantaging the youngest cohort, emerge also

as concerns yearly working weeks and earnings, but these differences are not statistically significant.

The paper is organized as follows. Section 2 reviews the related literature, while section 3 summarizes the institutional background concerning the labour market reform process in Italy. Sections 4 and 5 present, respectively, the dataset and the empirical strategy. Main findings on the comparison outcomes of those belonging to the two cohorts of tertiary graduates at entry and in each year of the six-year period after the graduation are shown in section 6, while mean earnings profiles along the six-year period of the two cohorts are compared in section 7. Section 8 concludes framing our results in the economic policy debate.

## **2. Related literature**

The idea of labor market flexibility has been at the center of the political and economic debate over the last three decades. In order to cope with high unemployment rates, the aim behind flexibilization was to make labor market equilibria and wages more responsive to demand and supply trends by removing the so-called rigidities, e.g. centralized bargaining, hiring and firing costs, automatic wage indexation mechanisms (OECD 1994, 1997). According to European Commission (2007), labor market flexibility would allow a wage moderation process benefiting productivity and country competitiveness.

In order to achieve these goals, a two-pronged strategy was advocated since the beginning of the '90s and concerned, on the one hand, the introduction of temporary and atypical contracts and, on the other hand, the reduction of firing costs in standard open-ended contracts. However, the reforming process in European countries has been usually characterized by a higher emphasis on the flexibilization at the margin, i.e. on easing the possibilities to hire by using deregulated temporary and atypical arrangements (Boeri 2011). In some countries, especially Italy and Spain, the process ended up with the setting up of the so-called two-tier system where the diffusion of temporary employment greatly increased and both flexible and permanent contracts coexist. A variety of research questions has driven the academic agenda in order to assess the outcomes of these reforms on workers' employability, on new entrants' chances to achieve permanent contracts, on possible earnings gaps between atypical and standard workers and, in general, on a possible influence of labour market deregulation on wage and productivity trends. However, the empirical evidence has not been unambiguous.

As concerns employability, Boeri and Garibaldi (2007) find a positive effect of flexibility at the margin on the employment rate in Italy, but counterbalanced by a negative impact on productivity, while Avdagic (2015) argues that the empirical evidence does not provide a clear support for the argument that a more rigid EPL increases unemployment. Instead, according to Blanchard and Landier (2002) and Dolado et al. (2002), the introduction of fixed-term contracts has increased unemployment because the prevailing outcome has been a higher turnover in temporary jobs.

One major concern refers to the effect of temporary contracts liberalization on the career dynamics, i.e. whether these arrangements serve as port of entry into the standard labor market or risk being a dead end into a precariousness trap. On the empirical side, contrasting results emerge: some evidences for the stepping-stone hypothesis have been provided for the UK (Booth et al. 2002), Germany (Hagen 2003) and France (Abowd et al. 1999), while other authors found risks of precariousness traps for atypical workers, e.g. De Lange et al. (2014) for Netherlands,

García-Pérez and Muñoz-Bullón (2011) for Spain, Scherer (2004) for Germany, Italy and the UK, Autor and Houseman (2005) and Segal and Sullivan (1997) for the US.

As concerns Italy, the port of entry hypothesis seems to hold when fixed-term contracts embody formal training (Berton et al. 2011, Picchio 2008, Barbieri and Sestito 2008). However, other studies signaled the existence of a possible precariousness trap for a large share of the Italian workforce (e.g. Muehlberger and Pasqua 2009, Corsini and Guerrazzi 2007, Scherer 2004) and all studies agree that most of the transitions from temporary to permanent arrangements occurs within the same firm and only once employers have exhausted the number of renewals of fixed-term arrangements that they are allowed to offer to the same employee.

At the same time, the literature has emphasized that temporary workers suffer along various dimensions, which encompass uncertainty about employment prospects, job quality, adverse wage gaps, reduced access to training and social security rights (Lucidi and Raitano 2009, Green et al. 2010). In spite of economic theories predicting a wage premium for atypical workers in order to off-set the risk of not being hired permanently (Rosen 1986), empirical evidences based on both individual-level and firm-level wage equations (e.g., Booth et al. 2002, de Lange et al. 2014, Dolado et al. 2002) show that atypical and fixed-term workers earn less than standard workers, even after individuals' and firms' characteristics are controlled for and this gap persists along the career path.

Beside differences in earnings between standard and atypical workers, the literature has also investigated whether an increase in labour market flexibilization can slacken wage dynamics also for standard workers. From the theoretical side, a negative link could be due to two (not alternative) mechanisms: i) a weakening of the bargaining position of insiders in a two-tier labour market (Boeri 2011); ii) a negative effect of flexibilization on productivity (Cappellari et al. 2012).

As concerns the first mechanism, two-tier reforms could generate a widening of institutional asymmetries that may affect the bargaining position of insiders, thus reducing their earnings due to a change in the bargaining power or to a downward shift of labor demand (Boeri 2011). Conversely, a higher EPL could strengthen the outside option of workers so that they may claim higher wages (Garibaldi and Violante 2005). Ordine and Rose (2016) point out that, after the creation of a two-tier labour market, new entrants face a new bargaining situation since firms have gained credible outside options which can be used to improve their bargaining outcome lowering wages. Consistently with their expectations, focusing on a sample of Italian tertiary graduates, Ordine and Rose (2016) found that entrants with standard contracts experienced a reduction in earnings of about -4.5% after the reforms introduced at the beginning of 2000s. At the macro level, the economic literature also pointed out the existence of a negative association between labour market flexibility and wage share. Labor market flexibility might be considered as a shift in the bargaining power between labor and capital in favor of the latter, as confirmed by Stockhammer (2015) who finds that the decrease in workers' bargaining power and the establishment of wage pacts had a negative impact on the wage share.

As concerns the second mechanism, reviewed by Cappellari et al. (2012), despite of certain mechanisms that could engender a positive link between flexibilization and productivity (e.g. a higher EPL could decrease productivity hampering the reallocation of workers and jobs across industries and firms or reducing workers effort or the undertaking of risky activities), various mechanisms suggest a positive relationship between EPL and productivity (e.g. more stringent EPL might provide insurance and promote specific investments and might make firms more selective when hiring workers). For instance, Blanchard and Landier (2002) and Cahuc and Postel-Vinay (2002) model temporary contracts as churning policies that negatively affect wage setting and may generate higher unemployment and lower productivity. In general, the effect of temporary

contracts on productivity, and then on wages, depends on whether temporary positions complement or displace permanent jobs. As concerns Italy, Cappellari et al. (2012) find that the process of labour market deregulation reduced capital intensity, generating productivity losses.

Finally, Rosolia and Torrini (2007) and Naticchioni et al. (2016) analyzed wage patterns at the beginning of the career of various cohorts of Italian workers and find that generations entering the labour market over the 1990s – i.e. in the decade characterized by the labour market deregulation – experienced, compared to the previous generations, a permanent loss in earnings during the first phase of the career due to a lower entry wage not offset by a faster career. Furthermore, Naticchioni et al. (2016) show that the deterioration of the earnings dynamics in the early career has not been homogenous across skills: tertiary graduates have suffered, compared to previous cohorts, an earnings penalty much more severe than that experienced by those holding at most an upper secondary or a lower secondary degree. From this perspective, Italy seems to be an outlier as no evidence of a relatively worsening trend for the high skilled emerged in the other OECD countries where this phenomenon has been investigated (Fitzenberger et al. 2001 for Germany, Beaudry and Green 2000 for Canada and Mishel 2012 for the US). Naticchioni et al. (2016) suggest that the deterioration of earnings patterns for the high skilled could have been due, on the one hand, to a weak trend of labour demand for the high skilled linked to features of the Italian productive system and, on the other hand, to the institutional changes, because the increase in flexibility could have entailed a reduction in bargaining power of young individuals.

### **3. Institutional background in Italy in the mid of 1990s-2000s**

Up to the mid of 1990s, the Italian labour market was considered as strictly regulated and characterized by a high level of rigidity. According to the OECD EPL index, Italy ranked fourth as the most rigid within EU15 countries in 1995. However, since the mid of the 1990s up to the mid of the 2000s, the Italian labour market experienced several reforms aimed at introducing numerous flexible contractual arrangements. The increase in labour market flexibility occurred at the margin: reforms released many of the legal constraints to hire workers on fixed-term contracts and defined various types of atypical arrangements without modifying EPL for permanent workers. Indeed, the process of labour market deregulation was defined “partial and targeted” (Esping Andersen and Regini 2000), as the new flexible arrangements mostly applied to new entrants in the labour market. Instead, a significant reduction in the protection of standard workers in case of unfair firing has been introduced only by two reforms introduced in 2012 and 2015, while a further deregulation of fixed-term contracts has been established in 2014

Though the milestone for the introduction of labour flexibility is usually set in 1997, when the so-called “Treu package” (Law 196 of 1997) was approved, the change in attitude was already evident in 1995, when the pension reform introduced a special fund for “parasubordinate” workers, i.e. low-paid workers that appear formally as self-employed, but that in practice are economically dependent on a single employer. Indeed, the introduction of this fund gave a powerful impulse to the proliferation of parasubordinate contracts, which were entitled to the lowest degree of social security rights and paid a reduced pension contribution rate (10% versus 33% for employees).

Then, the “Treu package” set the bases for a more systematic reform. This reform introduced temporary help agencies and internship contracts and provided a first re-modulation of the rules (dating back to 1962) concerning fixed-term employment, because it weakened the constraints to hire fixed-term employees and reduced the sanctions in case of violation of the discipline regulating the transformation of temporary contacts into open-ended arrangements.

The constraints on using fixed-term arrangements were largely removed by the Legislative Decree 368 of 2001 – on which we focus in this article – that transposed the EU directive 1999/70/CE, which compelled Member States to adopt a framework intended to ensure equal treatment between open-ended and fixed-term employees. The 2001 reform eased the use of fixed-term contracts by relieving employers from the obligation of writing in the contract the specific reasons for choosing a temporary arrangement. The rigid inventory of admissibility clauses for hiring on a temporary basis provided by the former regulation (allowed, for instance, in case of peaks in production or replacement of workers on sick or maternity leave) was replaced by a vague rule, according to which it became possible to hire fixed-term employees for “technical, productive, organizational or substitution” reasons.

The process of flexibilization of the Italian labour market was finally completed by the Law 30 of 2003 (“Biagi law”), that introduced new “atypical” arrangements for parasubordinate workers, as the “job on call”, the “staff leasing” and the “job sharing”.

After this intense phase of reforms, the regulatory framework appeared fragmented. On the one hand, the legislation on permanent contracts had not been affected by the liberalization process until the 2012 reform (the OECD EPL index for permanent workers remained constant at a value of 2.76 since the 1980s). On the other hand, the introduction of labour flexibility “at the margin” led to an impressive decrease in the EPL index for temporary workers from 5.25 in the late 1980s to 2.00 in 2003, and the value of this index suddenly reduced from 3.25 to 2.00 thanks to the 2001 reform.

The increasing role of temporary contracts in Italy over the mid of 1990s-2000s is clearly confirmed also by Eurostat figures showing that the share of employees hired on a temporary basis rose from 6.0% in 1993 to 13.1% in 2006 and the increase was further higher for workers aged 15-29 (from 11.4% in 1993 to 29.3% in 2006).

Finally, it has to be remembered that, in order to achieve wage moderation and reduce inflation, the automatic wage indexation was abolished in 1992 and a new binding agreement on wage bargaining among the social partners was introduced in 1993, establishing that the renewal of national collective contracts had to refer to the programmed inflation rate rather than to the expected inflation rate. According to some authors (e.g. Tronti 2007), the introduction of the 1993 agreement was effective in reducing inflation but was responsible of the wage deflation experienced in Italy since the mid of the 1990s, weakening the capacity of trade unions to bargain a steeper wage growth and favoring the reduction in the wage share of the GDP.

#### **4. Data**

We use the AD-SILC longitudinal dataset, constructed by merging cross-sectional waves 2004-2012 of IT-SILC (i.e. the Italian version of the European Union Statistics on Income and Living Conditions – EU-SILC) and the administrative longitudinal records provided by the Italian National Social Security Institute (INPS). The dataset concerns all individuals interviewed in the various waves of IT-SILC. In detail, cross-sectional variables collected in IT-SILC – that records crucial information about educational attainments and the year when the highest education was attained – have been enriched by longitudinal social security records since entry in the labour market up to 2013 of those interviewed in IT-SILC.

Social security records offer a comprehensive picture of the career of all types of Italian workers (i.e. public and private employees “parasubordinates” and all self-employed categories), as they

report, on a yearly basis and for each working relationship, gross earnings (including personal income taxes and social insurance contributions paid by the workers), working weeks, and the type of working relationship (exactly distinguishing the various categories of employees and self-employed). Therefore, INPS data allow us to perfectly reconstruct year by year the effective labour market experience (in weeks). Furthermore, once INPS data are matched with IT-SILC, we can also compute possible individuals' labour market experience when they attended the college or the high school. For private employees, INPS data also record the contractual arrangement (full-time versus part-time and fixed-term versus open-ended), the region of work, firm's size and productive sector (coded at the 2-digit NACE level). Therefore, crucial for our purposes, the AD-SILC dataset couples very detailed information on working histories obtained from social security archives with time-invariant information on workers' education recorded in IT-SILC.

As mentioned, we only focus on those who attained a tertiary degree in the 1998-2005 period for a couple of reasons. Firstly, in terms of earnings profiles, tertiary graduates emerge as the most penalized in the last decades in Italy when compared to older cohorts (Naticchioni et al. 2016). Secondly, focusing on tertiary graduates – and using the information on the year of graduation that is recorded in IT-SILC – allows us to distinguish individuals more or less exposed to the 2001 reform, grouping individuals according to a variable that can be considered exogenous to the reform, i.e. according to the year when they stopped studying and became active, thus distinguishing those graduated before or after the introduction of the 2001 reform.

As concerns tertiary graduates, the year of completion of University is then a very good proxy of the year when they became active, i.e. of their degree of exposition to the reform<sup>1</sup>. On the contrary, as concerns upper and lower secondary educated, we cannot distinguish those more or less exposed to the reform using an exogenous feature because we do not have an exact information on the year when they actually finished studying and became active. Indeed, the information about possible periods spent studying without attaining a tertiary degree is absent in IT-SILC, while we have only information on the year when workers attained the diploma. However, a high drop-out from high schools and from University characterizes Italy<sup>2</sup>, thus preventing us from using the year when the lower and upper secondary diploma was obtained as a proxy of the year when these individuals became active.

Assuming that the tertiary graduation year is not affected by the labour market reform, we can thus distinguish individuals according to the graduation year in order to identify those more exposed to the 2001 reform, i.e. those who became active as a tertiary graduate in the 2002-2005 period, and those less exposed, i.e. those who became active in the 1998-2001 period.

Using the longitudinal dimension of AD-SILC, each individual is followed for six years since the tertiary graduation year. We exclude from the sample individuals without the Italian citizenship because the retrospective AD-SILC panel under-represents immigrants in past years. Our balanced sample includes 19,374 observations, corresponding to 3,229 individuals tertiary graduated between 1998 and 2005, followed for six years after the graduation. The year of graduation is not included in our longitudinal sample, but we use retrospective information about possible labour market experience until the graduation year.

Our dataset records on an annual basis detailed job experiences of all types of workers, i.e. public and private employees, parasubordinate workers and all types of self-employed. Therefore, we are able to follow the career pattern of all individuals included in our sample as concerns, searching time, types of arrangements and worked weeks. When we focus on weekly wages and annual earnings (converted at constant prices 2015), we restrain our attention to private employees and parasubordinate workers because earnings of public employees present some

flaws in administrative INPS archives, while self-employed earnings are plagued by problems of underreporting in administrative archives (however, note that labour market experience, before and after the graduation, is computed taking into account also periods spent working as a public employee or a self-employed).

Preliminary descriptive evidence motivates our investigation as it shows different patterns for the two cohorts of tertiary graduates. As concerns average annual gross earnings received by private employees in the six years following the graduation, a clear gap disadvantaging those graduated since 2002 emerges and the gap keeps roughly constant during the observation period (Figure 1).

*Insert Figure 1 here*

However, the gap in earnings patterns across cohorts does not seem to be due to differences in the number of worked weeks per year, because no clear differences across cohorts in the patterns of yearly worked weeks by private employees in the six years after the graduation emerge (Figure 2).

*Insert Figure 2 here*

## **5. Empirical Strategy**

We aim at evaluating the influence of the deregulation of fixed-term employment arrangement approved in 2001, comparing working histories of individuals differently exposed to the reform. We cannot distinguish individuals according to their entry year in the labour market because the entry year can be clearly endogenous to the reform. Therefore, as mentioned, we distinguish individuals more or less affected by the reform according to the year when they attained the tertiary degree, assuming that the graduation year is exogenous to the reform. Hence, we define two cohorts of individuals, whose working history is compared in this article: those who attained the tertiary degree between 2002 and 2005, i.e. after the introduction of the reform that liberalized the usage of fixed-term arrangements, and those who graduated in the period between 1998 and 2001. Supporting the assumption of exogeneity between graduation age and the introduction of the reform, the median graduation age in our dataset is the same for both cohorts of tertiary graduates and is equal to 26.

Once identified the two cohorts to be compared, we run a set of regressions in order to investigate whether some individual outcomes – proxies of the success of the early career – changed across cohorts.<sup>3</sup>

In all regressions we control for individual characteristics (gender and the graduation age and its square), regions of work (we include dummies for regions, coded according to the NUTS-2 classification) and macroeconomic conditions, proxied by the yearly unemployment rate in the region of work. As mentioned, we follow individuals since the year after the graduation for a six-year period. However, in all regressions we also control for the workers' (possible) labour market experience (measured in weeks) until the graduation year (also including the square of the experience "pre-graduation") and, in some specifications, we also include a dummy identifying those individuals who, after the graduation, continued working in the same firm where they were employed before the graduation. Moreover, in additional specifications we control for further individual characteristics (experience since graduation measured in weeks, dummies on

contractual arrangement and searching time for the first job after the graduation) and, when focusing on private employees, on firm's features (size and sector, coded at 2 digits NACE).

We run three different groups of regressions, according to the type of outcome variable. We firstly focus on outcomes achieved at the entry in the labour market after the graduation: i) searching time for the first job after graduation (controlling, as clarified, for those we were already working)<sup>4</sup>, ii) type of contractual arrangement of this first job and iii) (log) weekly wages and (log) annual earnings obtained in the year when the individual started working after graduation. These estimates are run through OLS, apart from the regressions on contractual arrangements that are run through a multinomial logit model, according to the following equation:

$$y_{icj} = \alpha + \beta D_{ic} + \delta UR_{ij} + X'_{icj}\rho + \varepsilon_{icj} \quad (1)$$

where  $y_{icj}$  is the outcome of interest ( $i$  is the individual,  $c$  the graduation cohort and  $j$  the entry year after the graduation),  $D$  is a dummy with value 1 for those graduated since 2002 and 0 for those graduated until 2001,  $UR$  is the annual regional unemployment rate and  $X'_{icj}$  is the aforementioned set of individual characteristics used as controls. Thus, the main coefficient of interest is  $\beta$ , that captures whether the outcomes differ for those belonging to the two cohorts of tertiary graduates.

The second group of regressions runs equation (1) by each year  $t$  of distance from the graduation year ( $t$  varies from 1 to 6 and takes value 1 the year after the graduation) and considering as dependent variables annual working weeks, (log) weekly wages and (log) annual earnings, thus:

$$y_{ict} = \alpha + \beta D_{ic} + \delta UR_{it} + X'_{ict}\rho + \varepsilon_{ict}; \forall t(1, 6) \quad (2)$$

where  $i$  is the individual,  $c$  the graduation cohort and  $t$  the distance from the graduation year.<sup>5</sup>

Finally, we follow an estimation model proposed by Jenkins (2011) and Naticchioni et al. (2016) in order to depict mean weekly wages and annual earnings profiles in the six-year period after graduation of individuals belonging to the two cohorts under comparison. We estimate through OLS a simple model to identify the components of earnings dynamics that are cohort-specific and experience-specific, while controlling for workers' and firms' characteristics and for the business cycle (we use an OLS instead than a fixed-effect estimate because the cohort dummy, the core of our analysis, would not be identified in a fixed-effect model). In detail we estimate:

$$\begin{aligned} \log(w_{ict}) = & \beta_c * Cohort_{ic} + \gamma_c * Distance * Cohort_{ic} + \delta_c * Distance^2 * Cohort_{ic} \\ & + \vartheta_c * Distance^3 * Cohort_{ic} + \delta UR_{it} + X'_{ict}\rho + \varepsilon_{ict} \end{aligned} \quad (3)$$

where  $w_{ict}$  is the log of annual earnings or weekly wages of individual  $i$  of cohort  $c$  at distance  $t$  from the entry after graduation. The time earning dynamics is captured using for each cohort an intercept for the entry cohort and a trend for the six years of career after graduation. Hence, we include as covariates the cohort dummy, to allow for different intercepts, and the interaction terms between the cohort dummy and the distance (in year) from the graduation. In order to capture possible non-linearities we make use of a third degree polynomial in the distance from graduation. Therefore, estimated mean earnings along the first six years of the working life after graduation are computed for each cohort adding the predicted value of the third grade polynomial to the cohort specific  $\beta_c$  coefficient.

## 6. Individual labour market outcomes since the graduation

In this section evidences about individual labour market outcomes in the first six years of the working career after the tertiary graduation are presented. We firstly show results concerning searching time, contractual arrangement and weekly wages at entry and working weeks and annual earnings in the entry year and then analyze how weekly wages, annual earnings and working weeks evolve by year of distance since the graduation. Estimates are carried out by using OLS, apart from estimates for contractual arrangement at the entry that are carried out through a multinomial logit model.

As mentioned, searching time is measured, in months, by computing the distance from January of the year after the graduation and the month when the individual starts to work as a tertiary graduates. Because individuals may have experienced working periods before graduation, we also restrain the analysis to those who had never worked before the tertiary graduation or did not continue to work in the same firm where they worked before the graduation. Anyway, as highlighted, our dataset allows us to precisely control for possible working weeks experienced until up to the graduation year.

OLS estimates show that those graduated after the reform entry in the labour market sooner than their colleagues graduated before 2002 (Table 1), even if the estimated coefficient is not statistically significant when we take into account the whole sample of tertiary graduates (column 1, Table 1), i.e. without excluding those who already worked before the graduation. However, when we exclude those who had at least 52 weeks of experience until the graduation year, the coefficient turns out statistically significant (column 2, Table 1), showing that, on average, the cohort 2002-2005 starts to work around 1.2 month before the previous cohort. Interestingly, the effect is significant also when we exclude from the analysis those who after the graduation are still employed in the firm where they worked the year before the graduation (column 3, Table 1). It is also interesting to remark that, in all specifications, a higher age at graduation is associated with a sooner entry (but this effect could be due to a greater experience of late graduates, as the sign is no significant when we exclude those with a large experience before graduation; column 2, Table 1), while, as expected, experience prior graduation significantly reduces entry time.

*Insert Table 1 here*

The decrease in searching time can be considered as a success of the deregulation process. Coherently, new entrants in the post reform cohort start to work more frequently than the previous cohort through atypical arrangements (i.e. as fixed term employees or parasubordinate workers). Descriptive evidence on the frequencies of contractual arrangements at the entry clearly confirms this trend (Table 2), as the share of new entrants as full-time open ended employees is lower for the 2002-2005 cohort, especially when we restrain our attention to those not starting to work in the firm where they were employed before the graduation.

*Insert Table 2 here*

These results are confirmed when multinomial logit regressions are run (Tables 3A and 3B, where the omitted category refers to entry as an open-ended full-time employee). Indeed, when looking at the whole sample (Table 3A), the 2002-2005 cohort – compared to the 1998-2001 cohort – is characterized by a significantly higher probability to start working as a parasubordinate worker or as a fixed-term employee (full-time or part-time) than as an open-ended full-time employee and

these findings are confirmed when we exclude from the analysis those who continue to work in the pre-graduation firm (Table 3B).

*Insert Table 3A here*

*Insert Table 3B here*

Hence, our preliminary results show that the youngest cohort experienced a sort of trade-off between a relatively earlier entry and a higher risk to be employed through an atypical and less secure arrangement. The comparison between pre and post reform cohorts has then to be carried out by taking into account further dimensions, namely earnings and working weeks.

A striking result concerns gross weekly wages earned in the entry year (Table 4). Consistently with literature predictions who argues that labour market liberalization can engender wage moderation for new entrants (independently on their contractual arrangement), due to the interplay of a weakened bargaining power and a lower productivity by firms interested at reducing labour costs increasing workers turnover (see Section 2), the post-reform cohort is characterized by a wage significantly lower than the previous cohort.

As mentioned, analysis about earnings and wages are carried out restraining our attention to private employees and parasubordinate workers, as earnings of public employees and self-employed are plagued by measurement errors and under-reporting in administrative archives. When focusing on both private employees and parasubordinate workers (column 1, Table 4), post reform workers experience a weekly wage penalty amounting around 5.9% and this penalty increases over 7% when we consider private employees only (columns 2 and 3, Table 4, where in column 3 we also control for the type of employment contractual arrangement). The wage gap turns out weakly significant (p value amounts to 0.10) only in the "full covariates" specification (column 4, Table 4), i.e. when we control for several individual's and firm's characteristics (as firm's size and sector) that could mediate the relationship between entry into activity after the reform and receiving a lower wage.

*Insert Table 4 here*

However, a significant wage gap between the two cohorts disappears when we consider as dependent variable annual earnings in the entry year, even if the estimated coefficient keeps negative when we restrain the analysis to private employees (Table 5).

*Insert Table 5 here*

The contradictory effect between weekly wages and annual earnings could be due to both a lower searching time for the post-reform cohort that compensates for lower unitary wages and to a greater number of working weeks in the entry year. However, our estimates do not support the idea that the employability of the 2002-2005 cohort increases, since no significant increase in working weeks by those graduated after 2001 emerges neither in the year after the graduation nor in the following ones, independently on the considered subsample (Table 6, where in panel 1 we consider all individuals – also those working 0 weeks –, while in panels 2 and 3 we focus, respectively, on private employees and parasubordinate workers and on private employees only).

*Insert Table 6 here*

Conversely, the significant gap in weekly wages for the 2002-2005 cohort persist along each year following the graduation (Table 7) in all specifications and also when we restrain the analysis to private employees and control for contractual type, firm's sector and size (panel 3, Table 7). Looking at private employees in the "parsimonious" specification (panel 2, Table 7), the wage gap is roughly constant and amounts around 8% until the fourth year after the graduation and reduces afterwards.

*Insert Table 7 here*

Consistently with the results about the entry year, significant wage gaps disappear when we focus on annual earnings (Table 8), even if the estimated coefficients are negative unless in the more demanding specification when we also control for firm's characteristics and contractual arrangement (panel 3, Table 8).

*Insert Table 8 here*

## **7. Wage profiles along the six-year period after the graduation**

As explained in Section 5, we follow an estimation model proposed by Jenkins (2011) and Naticchioni et al. (2016) in order to depict mean weekly wages and annual earnings profiles in the six-year after graduation of individuals belonging to the two cohorts under comparison. In detail, to control for the changing composition of the labour force and for the business cycle and to identify the components of earnings dynamics that are cohort-specific and experience-specific, we resort to a regression framework, using OLS.

Figures 3A-3C show the estimated trends of gross weekly wages relative only to the cohort and experience variables, obtained using OLS estimates of equation (3) and also showing the 90% intervals of confidence for each estimated curve, while Figures 4A-4C focuses on estimated trends of gross annual earnings (confidence intervals are computed using bootstrapping on predicted values of the cohort polynomials). Therefore, each curve expresses, for each cohort, the predicted values from the estimates of the term:

$$\beta_c * Cohort_{ic} + \gamma_c * Distance * Cohort_{ic} + \delta_c * Distance^2 * Cohort_{ic} + \vartheta_c * Distance^3 * Cohort_{ic} \quad (4)$$

For the sake of comparison, values are expressed relatively to earnings in the first year after graduation of the cohort of graduates in the 1998-2001 period, thus values express the percentage changes with respect to starting wages of the 1998-2001 cohort.

A look at the graphs confirms the evidence of the analysis by year shown in Section 6. As concerns weekly wages, the post-reform generation is characterized by a wage profile always lower than that characterizing the 1998-2001 cohort (Figure 3A, 3B and 3C, focusing, respectively, on private employees and parasubordinate workers, on private employees controlling for employment arrangement and on private employees also controlling for firm's size and sector; a slight overlapping of intervals of confidence emerges when this more demanding specification is run).

*Insert Figure 3A-3C here*

As concerns annual earnings, instead, the gaps turn out not significant. Indeed, even if the earnings profiles of the 2002-2005 cohort are always below those of the previous cohort, the intervals of confidence of the estimated curves overlap, especially when additional firm's controls are included among the covariates (Figure 4A, 4B and 4C, focusing, respectively, on private employees and parasubordinate workers, on private employees controlling for employment arrangement and on private employees also controlling for firm's size and sector).

*Insert Figure 4A-4C here*

## **8. Conclusions**

In this article, exploiting an innovative longitudinal dataset for Italy, we evaluated the starting working histories of two cohorts of tertiary graduates who entered the labour market since the second mid of the 1990s, i.e. since the start of the reform process that greatly deregulated the Italian labour market, mostly easing the chances for firms to hire through atypical and temporary arrangements. In order to evaluate a possible influence of the reform that further liberalized fixed-term arrangement at the end of 2001, we compared (through econometric estimates and controlling for business cycle and dozens of covariates) the starting working histories of two cohorts of tertiary graduates – those who attained the degree in the 1998-2001 period and in the 2002-2005 period – thus comparing outcomes of individuals with the same education, who entered in the labour market when the reform process had already begun, but who differ because the youngest entered the labour market after a reform that further liberalized the labour market. We focused on several individual outcomes during the first six-year of the career: i.e., duration of the searching time, first contractual arrangement, entry wages and – along the six-year period – working weeks, weekly wages and annual earnings.

We find that the searching time for the first job decreased for those graduated after 2001, thus signaling the efficacy of the reform in reducing unemployment spells after the graduation. However, new entrants in the post reform cohort start working more frequently through atypical and temporary arrangements, that are characterized in Italy by lower wages and welfare state guarantees.

Our most novel and interesting result concerns wage profiles in the starting phase of the career. Indeed the youngest cohort is characterized by significantly lower weekly wages both at the entry and along the first six years of the working life. On the contrary no evidence of an increase in employability emerges, since no significant differences in working weeks along the initial phase of the career between those graduated before and after 2001 emerge. However, when looking at annual earnings, the gap disadvantaging the 2002-2005 cohort persists, but it is not statistically significant.

The economic literature has not extensively inquired whether the process of labour market flexibilization has been associated to a process of wage moderation, even if some authors have pointed out that – reducing outside options for both standard and atypical workers – the reduction in EPL could weak workers' and trade unions' bargaining power in a two-tier labour market thus reducing wages. Furthermore, when labour market reforms lack of effective complementary industrial policies, the deregulation process could engender a slackening of productivity that further devaluates wage growth.

Our findings are, therefore, consistent with theoretical predictions of a possible negative link between flexibilization and wage dynamics, even if our analyses do not allow to distinguish

between the two (not alternative) explanations of this possible link. However, our findings clearly suggest that several short- and medium-term effects of the reforms have to be taken into account when policy measures are considered, because the reforms could engender a trade-off between the different outcomes. Therefore, in order to assess the acceptability of a reform that reduces searching time and negatively affects wage profiles, the net welfare effects on individuals should be taken into account. Before carrying out this type of analysis in future works, we can conclude that a reform associated to a decrease in wages might not be considered as welfare enhancing.

## Endnotes

1. In IT-SILC also post tertiary degree are recorded (i.e. further master classes or PhD) and the year of completion of studies for post tertiary graduates (a very limited share of Italian workers) refers to the year when the post tertiary degree was attained. Furthermore, we exclude from the analysis the few tertiary graduates that were still studying at the time of interview in IT-SILC.
2. According to OECD figures for 2002 reported by Cingano and Cipollone (2002), the drop-out rate from university amounted to 57.8% in Italy, while it was 36.3% in France, 28.5% in Germany, 23.7% in Spain and 17.0% in the UK.
3. Individuals graduated before 2001 are also hit by the reform during their career. However, following insights by Oreopoulos et al (2012), we compare outcomes of the two cohorts because we argue that conditions at entry are crucial drivers because of the path dependency process that characterizes individuals' working career.
4. Searching time is measured (in months) as the distance of the starting month of the first job after graduation from January of the year following the graduation. Therefore, being individuals observed in a six-year period, searching time can vary from 1 to 72 (for those who start working at December of the sixth year after the graduation).
5. Estimates of weekly wages and annual earnings in the year after graduation can differ from estimates related to the first job after graduation because in the latter case also work relationship started after the end of the first year after graduation are considered, while in the estimates at "distance 1" only individuals earning a positive wage in that year are included in the analysis.

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Tab. 1: OLS estimates of searching time of the first job after graduation

	Full sample	Excluding those with large experience before graduation <sup>a</sup>	Excluding those who continue to work in the pre-graduation firm
<i>cohort 2002-2005</i>	-0.7103 [0.5591]	-1.2426* [0.7366]	-1.0908* [0.6402]
female	0.1660 [0.4866]	0.0585 [0.6417]	0.2799 [0.5565]
graduation age	-2.4910* [1.3743]	-3.1228 [1.9502]	-2.6974* [1.6255]
graduation age <sup>2</sup>	0.0433* [0.0250]	0.0558 [0.0361]	0.0471 [0.0298]
exp. pre-graduation	-0.0636*** [0.0051]	-0.4284*** [0.0788]	-0.0695*** [0.0074]
exp. pre-graduation <sup>2</sup>	0.0001*** [0.0000]	0.0057*** [0.0020]	0.0001*** [0.0000]
Regional unemp. rate	Yes	Yes	Yes
Regional F.E.	Yes	Yes	Yes
Obs.	3,229	2,314	2,793

<sup>a</sup> Only individuals with less than 52 worked weeks until the graduation year are considered.

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source: elaborations on AD-SILC data

Tab. 2: Distribution of the of the first contractual arrangements after graduation (% values)

	Whole sample			Individuals not starting to work in the pre-graduation firm		
	All cohorts	Cohort 1998-2001	Cohort 2002-2005	All cohorts	Cohort 1998-2001	Cohort 2002-2005
Open-ended F.T. pr. emp.	22.4	23.7	21.4	20.9	23.1	19.2
Open-ended P.T. pr. emp.	5.0	5.3	4.8	4.6	5.4	4.0
Fixed-term F.T. pr. emp.	17.7	17.9	17.5	19.6	19.7	19.5
Fixed-term P.T. pr. emp.	4.5	3.1	5.7	5.1	3.3	6.6
Public employee	13.6	14.6	12.8	13.0	13.5	12.6
Parasubordinate	20.6	18.9	22.0	21.7	19.5	23.5
Self-employed	16.2	16.6	15.9	15.1	15.7	14.6

Source: elaborations on AD-SILC data

Tab. 3A: Multinomial logit estimates of the of the first contractual arrangement after graduation (full-time open-ended private employee as the reference category). Full sample

	Part-time open-ended private emp.	Full-time fixed-term private emp.	Part-time fixed-term private emp.	Public emp.	Parasub. worker	Self- employed
<i>cohort 2002-2005</i>	0.0511 [0.2023]	0.3219** [0.1301]	0.7906*** [0.2198]	-0.0641 [0.1433]	0.3764*** [0.1253]	0.0772 [0.1329]
unemp. rate	1.0389*** [0.1978]	0.1100 [0.1160]	1.0606*** [0.2117]	0.7503*** [0.1300]	0.2886*** [0.1119]	0.1706 [0.1179]
female	-0.8458* [0.4705]	0.6120* [0.3617]	0.2443 [0.5882]	-0.7286** [0.3379]	0.3127 [0.3294]	0.5046 [0.3443]
graduation age	0.0160* [0.0085]	-0.0108 [0.0067]	-0.0044 [0.0109]	0.0143** [0.0061]	-0.0045 [0.0060]	-0.0066 [0.0062]
grad. age^2	-0.0006 [0.0017]	-0.0063*** [0.0016]	-0.0053 [0.0033]	0.0023* [0.0012]	-0.0053*** [0.0013]	-0.0025** [0.0012]
exp. pre-grad.	0.0000 [0.0000]	0.0000 [0.0000]	0.0000 [0.0000]	-0.0000** [0.0000]	0.0000 [0.0000]	0.0000 [0.0000]
Regional unemp. rate	Yes	Yes	Yes	Yes	Yes	Yes
Regional F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	3,229	3,229	3,229	3,229	3,229	3,229

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source: elaborations on AD-SILC data

Tab. 3B: Multinomial logit estimates of the of the first contractual arrangements after graduation (full-time open-ended private employee as the reference category).  
Excluding those who continue to work in the pre-graduation firm

	Part-time open-ended private emp.	Full-time fixed-term private emp.	Part-time fixed-term private emp.	Public emp.	Parasub. worker	Self- employed
<i>cohort 2002-2005</i>	-0.0279 [0.2257]	0.3448** [0.1368]	0.9066*** [0.2275]	0.0411 [0.1580]	0.4536*** [0.1343]	0.1107 [0.1477]
unemp. rate	1.0808*** [0.2227]	0.1324 [0.1222]	1.0968*** [0.2172]	0.8182*** [0.1449]	0.3202*** [0.1201]	0.1840 [0.1319]
female	-0.4348 [0.5543]	0.9711** [0.3897]	0.3661 [0.5947]	-0.6728* [0.3805]	0.5957* [0.3602]	0.8862** [0.3988]
graduation age	0.0091 [0.0101]	-0.0176** [0.0072]	-0.0065 [0.0110]	0.0131* [0.0069]	-0.0101 [0.0066]	-0.0138* [0.0073]
grad. age^2	-0.0001 [0.0031]	-0.0015 [0.0021]	-0.0019 [0.0036]	0.0043** [0.0017]	-0.0042*** [0.0016]	-0.0082*** [0.0018]
exp. pre-grad.	0.0000 [0.0000]	0.0000 [0.0000]	0.0000 [0.0000]	-0.0000** [0.0000]	0.0000 [0.0000]	0.0000*** [0.0000]
Regional unemp. rate	Yes	Yes	Yes	Yes	Yes	Yes
Regional F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,793	2,793	2,793	2,793	2,793	2,793

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source: elaborations on AD-SILC data

Tab. 4: OLS estimates of weekly wage in the first working year after graduation<sup>a</sup>

	Priv. emp. or parasub.	Priv. emp.	Priv. emp. plus contractual arrang. <sup>b</sup>	Priv. emp. Full covariates <sup>c</sup>
<i>cohort 2002-2005</i>	-0.0585*** [0.0221]	-0.0747** [0.0302]	-0.0704** [0.0324]	-0.0503* [0.0309]
female	0.1512*** [0.0580]	0.1962** [0.0781]	0.0951 [0.0639]	0.0015 [0.0617]
graduation age	-0.0026** [0.0011]	-0.0034** [0.0014]	-0.0015 [0.0012]	0.0002 [0.0011]
grad. age <sup>2</sup>	0.0009*** [0.0002]	0.0009*** [0.0003]	0.0008*** [0.0003]	0.0008*** [0.0002]
exp. pre-grad.	0.0000 [0.0000]	0.0000 [0.0000]	0.0000 [0.0000]	-0.0000* [0.0000]
same pre-grad. firm	-0.0665* [0.0370]	-0.0715 [0.0501]	-0.0310 [0.0414]	-0.0340 [0.0385]
open-ended P.T. pr. emp.			-0.8212*** [0.0384]	-0.6594*** [0.0374]
fixed-term F.T. pr. emp.			0.0469 [0.0344]	0.0129 [0.0330]
fixed-term P.T. pr. emp.			-0.6228*** [0.0492]	-0.4944*** [0.0477]
cohort 02-05*fixed-term			0.0050 [0.0441]	0.0220 [0.0415]
searching time				-0.0018** [0.0009]
Regional unemp. rate	Yes	Yes	Yes	Yes
Regional F.E.	Yes	Yes	Yes	Yes
Obs.	2,159	1,509	1,500	1,477

<sup>a</sup> In all regressions the following control variables are included: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, worker's type (private employee vs parasubordinate worker). <sup>b</sup> Dummies about the type of contractual arrangements for employees plus the interaction between the cohort dummy and the dummy on fixed-term employment arrangement are added. <sup>c</sup> Searching time for the first job after graduation and dummies on class of firm size and sector fixed effects are added. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source: elaborations on AD-SILC data

Tab. 5: OLS estimates of annual earnings in the first working year after graduation<sup>a</sup>

	Priv. emp. or parasub.	Priv. emp.	Priv. emp. plus contractual arrang. <sup>b</sup>	Priv. emp. Full covariates <sup>c</sup>
<i>cohort 2002-2005</i>	0.0087 [0.0542]	-0.0172 [0.0645]	-0.0447 [0.0786]	-0.0607 [0.0754]
female	0.3286** [0.1421]	0.2772* [0.1671]	0.1900 [0.1550]	-0.0068 [0.1505]
graduation age	-0.0059** [0.0026]	-0.0050 [0.0031]	-0.0033 [0.0028]	0.0002 [0.0028]
grad. age <sup>2</sup>	0.0052*** [0.0006]	0.0047*** [0.0007]	0.0041*** [0.0006]	0.0034*** [0.0006]
exp. pre-grad.	-0.0000*** [0.0000]	-0.0000*** [0.0000]	-0.0000*** [0.0000]	-0.0000*** [0.0000]
same pre-grad. firm	0.1018 [0.0913]	0.0322 [0.1073]	0.0196 [0.1004]	0.0333 [0.0940]
open-ended P.T. pr. emp.			-1.0380*** [0.0931]	-0.7334*** [0.0912]
fixed-term F.T. pr. emp.			-0.2815*** [0.0833]	-0.1691** [0.0804]
fixed-term P.T. pr. emp.			-1.3882*** [0.1192]	-0.9554*** [0.1164]
cohort 02-05*fixed-term			0.1658 [0.1070]	0.1704* [0.1012]
searching time				-0.0168*** [0.0022]
Regional unemp. rate	Yes	Yes	Yes	Yes
Regional F.E.	Yes	Yes	Yes	Yes
Obs.	2,256	1,510	1,501	1,478

<sup>a</sup> In all regressions the following control variables are included: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, worker's type (private employee vs parasubordinate worker). <sup>b</sup> Dummies about the type of contractual arrangements for employees plus the interaction between the cohort dummy and the dummy on fixed-term employment arrangement are added. <sup>c</sup> Searching time for the first job after graduation and dummies on class of firm size and sector fixed effects are added. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Source: elaborations on AD-SILC data

Tab. 6: OLS estimates of annual working weeks by distance from the year of graduation.  
Estimated coefficient of the cohort dummy<sup>a</sup>

	Total working weeks <sup>b</sup>			Working weeks as a private employees or parasubordinate workers			Working weeks as a private employee		
	Coeff.	S.D.	Obs.	Coeff.	S.D.	Obs.	Coeff.	S.D.	Obs.
Year 1	-1.0044	[0.8105]	3,229	-0.9916	[0.7689]	2,150	-0.6650	[1.0595]	1,113
Year 2	0.6585	[0.8440]	3,229	-0.1945	[0.6732]	2,503	-0.1148	[0.9353]	1,266
Year 3	-0.1929	[0.8205]	3,229	-0.0837	[0.6052]	2,716	-1.1117	[0.8193]	1,369
Year 4	-0.1996	[0.7371]	3,229	-0.0293	[0.5368]	2,860	0.2648	[0.6907]	1,408
Year 5	0.3849	[0.6341]	3,229	0.1448	[0.4547]	2,914	-0.3059	[0.6041]	1,461
Year 6	0.3622	[0.6636]	3,229	0.4819	[0.4869]	2,972	0.1441	[0.6802]	1,466

<sup>a</sup> In all regressions the following control variables are included: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square. <sup>b</sup> Individuals working zero weeks in a year are included. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.  
Source: elaborations on AD-SILC data

Tab. 7: OLS estimates of weekly wages by distance from the year of graduation.  
Estimated coefficient of the cohort dummy<sup>a</sup>

	Private employee or parasubordinate worker <sup>b</sup>			Private employee			Private employee. Full covariates <sup>b</sup>		
	Coeff.	S.D.	Obs.	Coeff.	S.D.	Obs.	Coeff.	S.D.	Obs.
Year 1	-0.0555**	[0.0243]	1,526	-0.0799**	[0.0311]	1,113	-0.0242	[0.0243]	1,093
Year 2	-0.0651***	[0.0237]	1,732	-0.0816***	[0.0301]	1,264	-0.0432*	[0.0237]	1,247
Year 3	-0.0688***	[0.0219]	1,817	-0.0753***	[0.0261]	1,367	-0.0468**	[0.0196]	1,349
Year 4	-0.0692***	[0.0237]	1,840	-0.0800***	[0.0288]	1,407	-0.0407*	[0.0240]	1,387
Year 5	-0.0588***	[0.0198]	1,835	-0.0494**	[0.0229]	1,461	-0.0312*	[0.0183]	1,444
Year 6	-0.0630***	[0.0229]	1,812	-0.0393	[0.0260]	1,465	-0.0206	[0.0209]	1,445

<sup>a</sup> In all regressions the following control variables are included: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, worker's type (private employee vs parasubordinate worker) and experience since the year after the graduation. <sup>b</sup> The following control variables are added: type of contractual arrangement, class of firm size, sector fixed effects. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.  
Source: elaborations on AD-SILC data

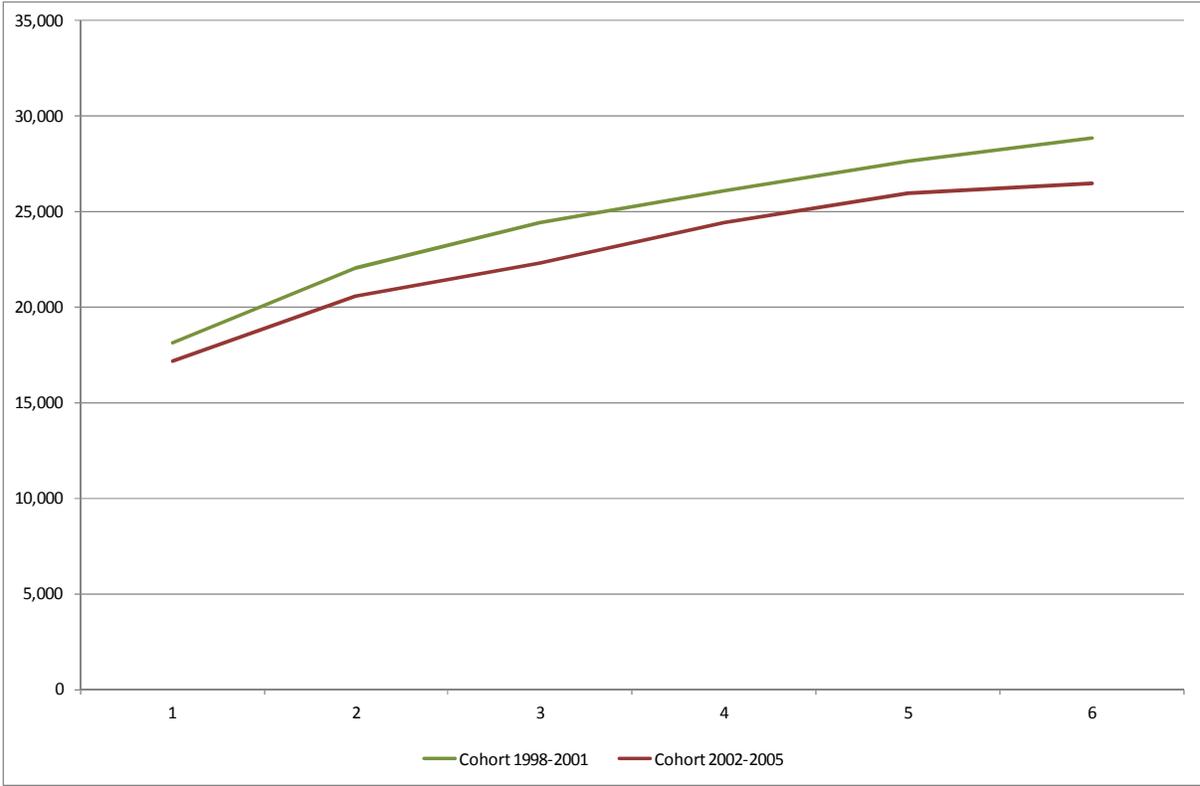
Tab. 8: OLS estimates of annual earnings by distance from the year of graduation.  
 Estimated coefficient of the cohort dummy<sup>a</sup>

	Private employee or parasubordinate worker <sup>b</sup>			Private employee			Private employee. Full covariates <sup>b</sup>		
	Coeff.	S.D.	Obs.	Coeff.	S.D.	Obs.	Coeff.	S.D.	Obs.
Year 1	-0.0200	[0.0305]	1,580	-0.0499	[0.0355]	1,113	-0.0055	[0.0308]	1,093
Year 2	-0.0083	[0.0400]	1,766	-0.0292	[0.0474]	1,267	0.0374	[0.0441]	1,249
Year 3	-0.0603	[0.0380]	1,844	-0.0631	[0.0410]	1,371	-0.0495	[0.0353]	1,351
Year 4	-0.0291	[0.0364]	1,864	-0.0427	[0.0395]	1,409	0.0052	[0.0368]	1,389
Year 5	-0.0264	[0.0324]	1,862	-0.0308	[0.0346]	1,465	0.0095	[0.0319]	1,448
Year 6	-0.0206	[0.0363]	1,831	-0.0157	[0.0383]	1,469	0.0123	[0.0344]	1,448

<sup>a</sup> In all regressions the following control variables are included: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, worker's type (private employee vs parasubordinate worker) and experience since the year after the graduation. <sup>b</sup> The following control variables are added: type of contractual arrangement, class of firm size, sector fixed effects. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

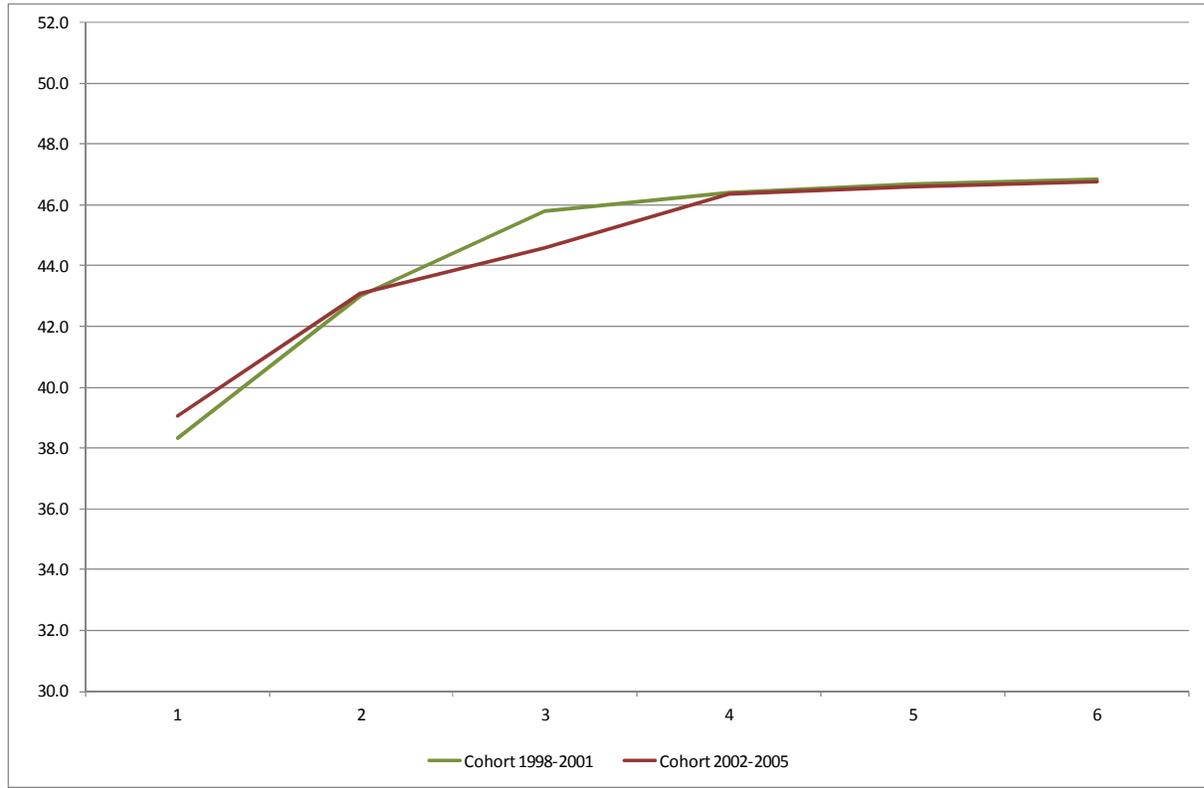
Source: elaborations on AD-SILC data

Fig. 1: Average real gross annual earnings of private employees in the six years following the graduation year, by cohort of graduation



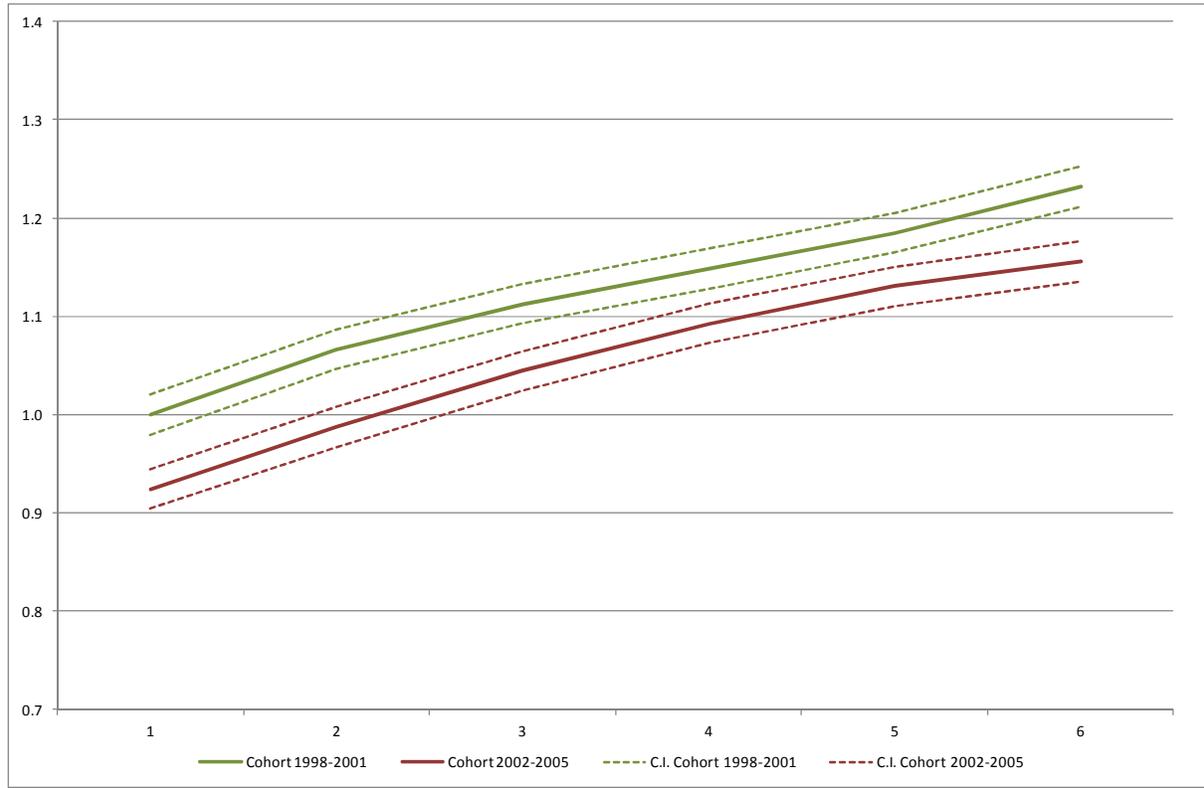
Source: computations on AD-SILC data

Fig. 2: Average number of yearly working weeks as a private employee in the six years following the graduation year, by cohort of graduation



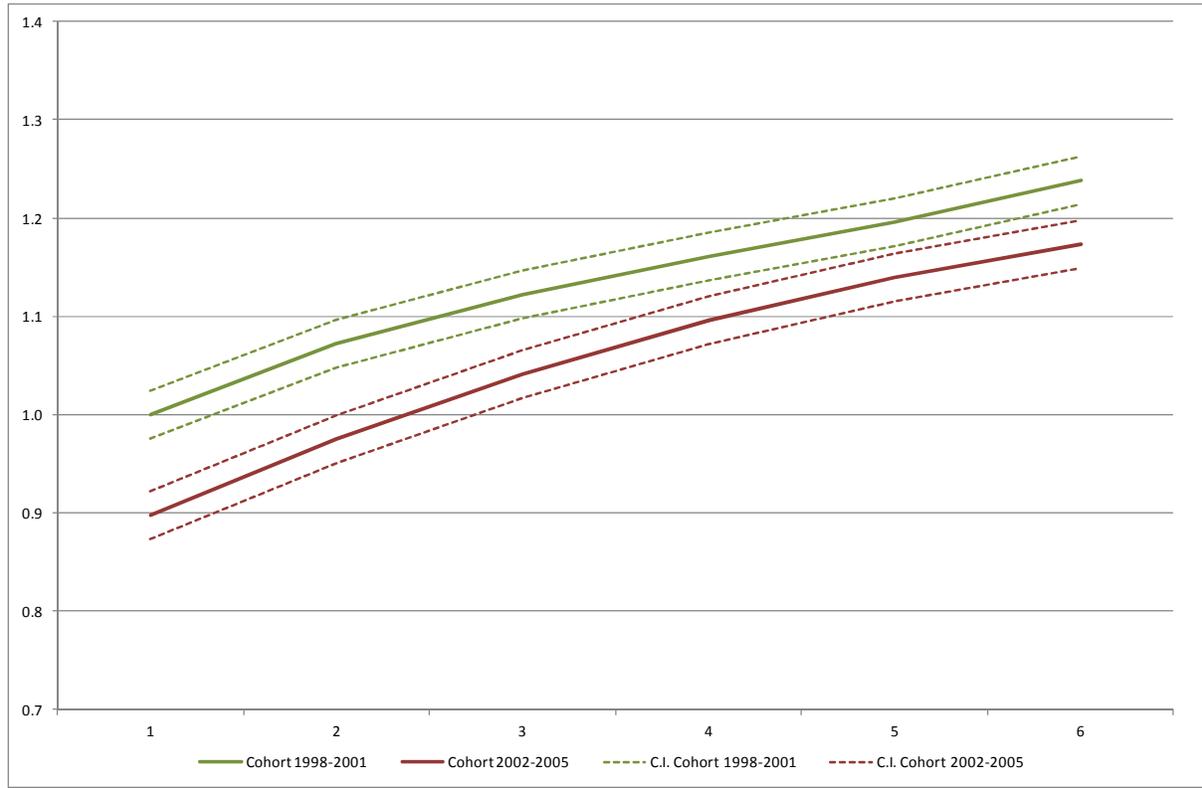
Source: computations on AD-SILC data

Fig. 3A: OLS estimates of weekly wages by graduation cohort in the six years following the graduation. Private employees and parasubordinate workers<sup>a</sup>



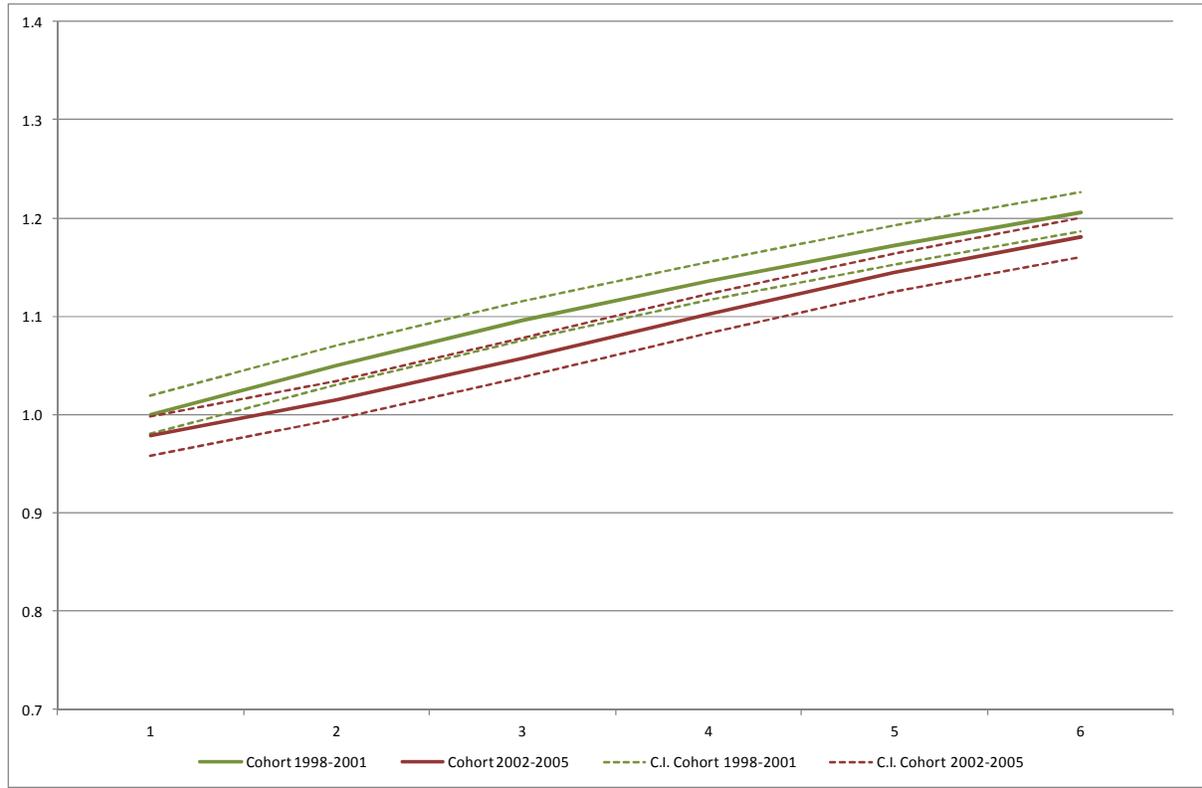
<sup>a</sup> Predicted values from OLS estimates on gross log weekly wages of the term  $\hat{\beta}_j * Cohort_{ij} + \hat{\gamma}_j * Distance_{ijt} * Cohort_{ij} + \hat{\delta}_j * Distance_{ijt}^2 * Cohort_{ij} + \hat{\eta}_j * Distance_{ijt}^3 * Cohort_{ij}$ , expressed relatively to the earnings in the starting year of the cohort 1998-2001. Control variables included in the regression: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, worker's type (private employee vs parasubordinate worker). Source: computations on AD-SILC data

Fig. 3B: OLS estimates of weekly wages by graduation cohort in the six years following the graduation. Private employees<sup>a</sup>



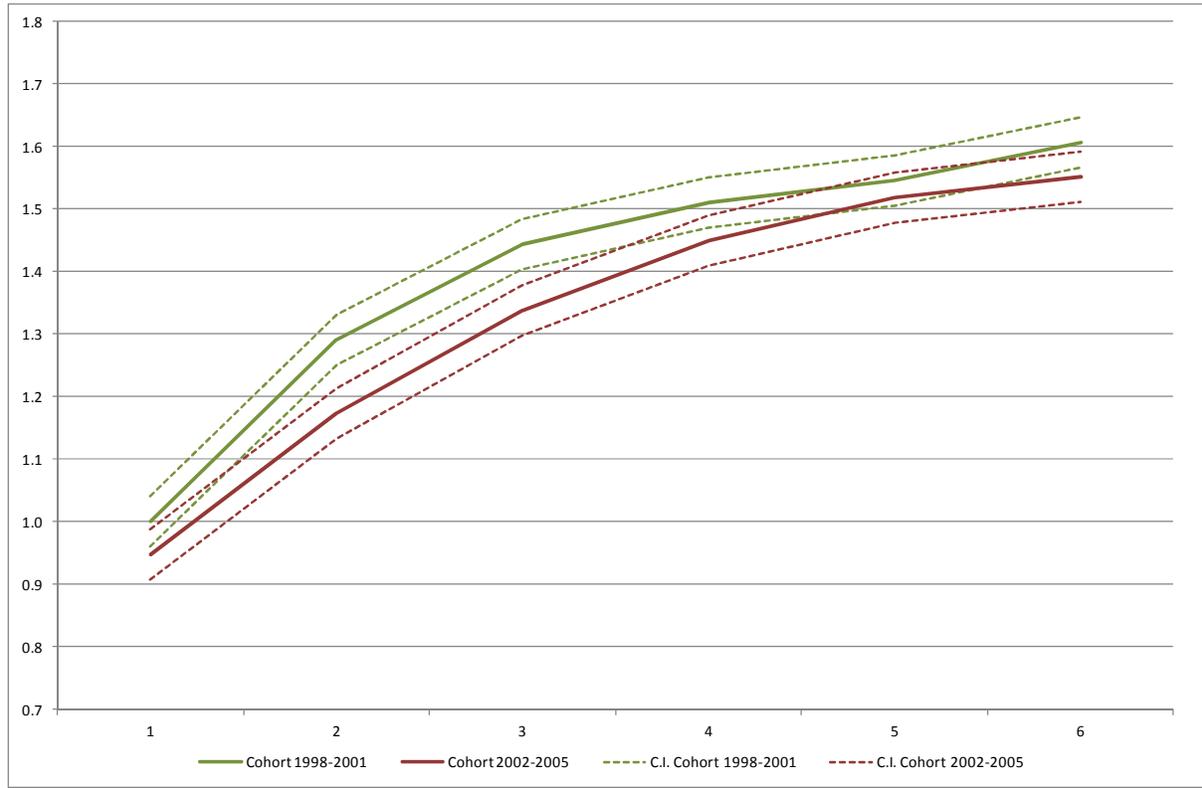
<sup>a</sup> Predicted values from OLS estimates on gross log weekly wages of the term  $\hat{\beta}_j * Cohort_{ij} + \hat{\gamma}_j * Distance_{ijt} * Cohort_{ij} + \hat{\delta}_j * Distance_{ijt}^2 * Cohort_{ij} + \hat{\eta}_j * Distance_{ijt}^3 * Cohort_{ij}$ , expressed relatively to the earnings in the starting year of the cohort 1998-2001. Control variables included in the regression: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square. Source: computations on AD-SILC data

Fig. 3C: OLS estimates of weekly wages by graduation cohort in the six years following the graduation. Private employees. Full covariates <sup>a</sup>



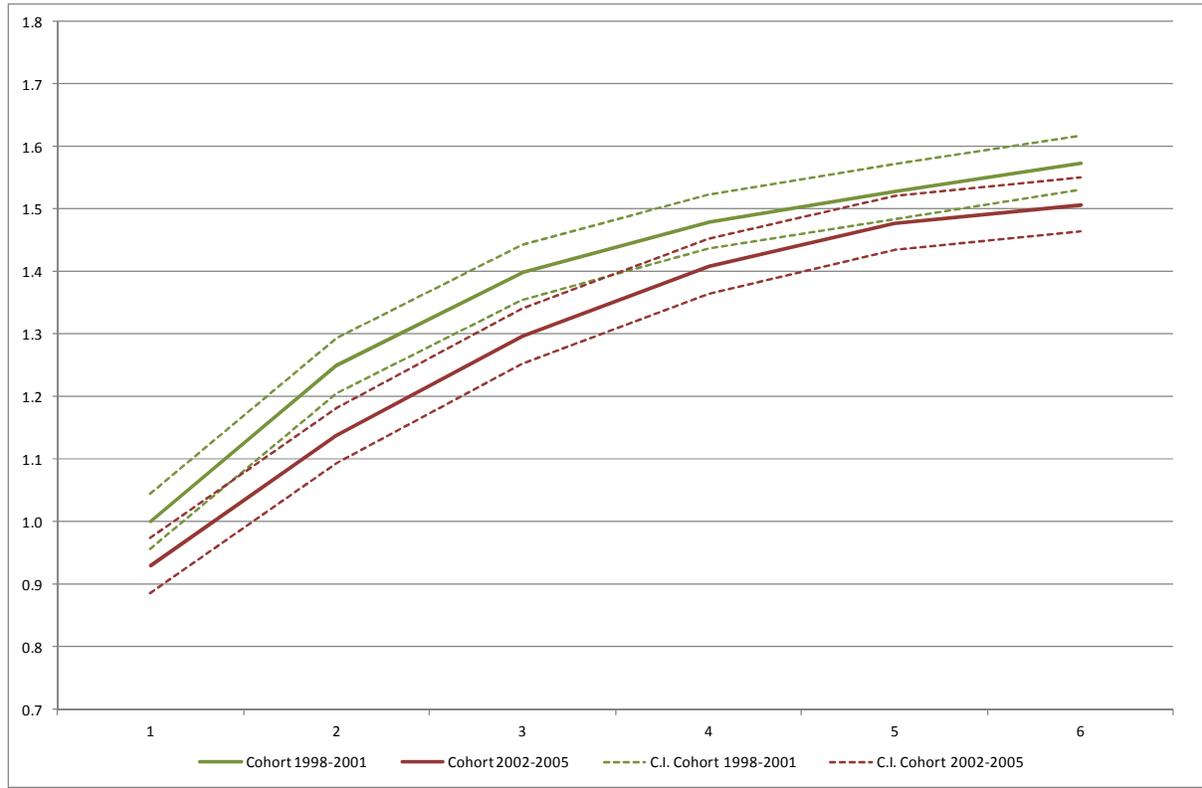
<sup>a</sup> Predicted values from OLS estimates on gross log weekly wages of the term  $\hat{\beta}_j * Cohort_{ij} + \hat{\gamma}_j * Distance_{ijt} * Cohort_{ij} + \hat{\delta}_j * Distance_{ijt}^2 * Cohort_{ij} + \hat{\eta}_j * Distance_{ijt}^3 * Cohort_{ij}$ , expressed relatively to the earnings in the starting year of the cohort 1998-2001. Control variables included in the regression: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, dummies about the type of contractual arrangements for employees plus the interaction between the cohort dummy and the dummy on fixed-term employment arrangement, searching time for the first job after graduation and dummies on class of firm size and sector fixed effects. Source: computations on AD-SILC data

Fig. 4A: OLS estimates of annual earnings by graduation cohort in the six years following the graduation. Private employees and parasubordinate workers<sup>a</sup>



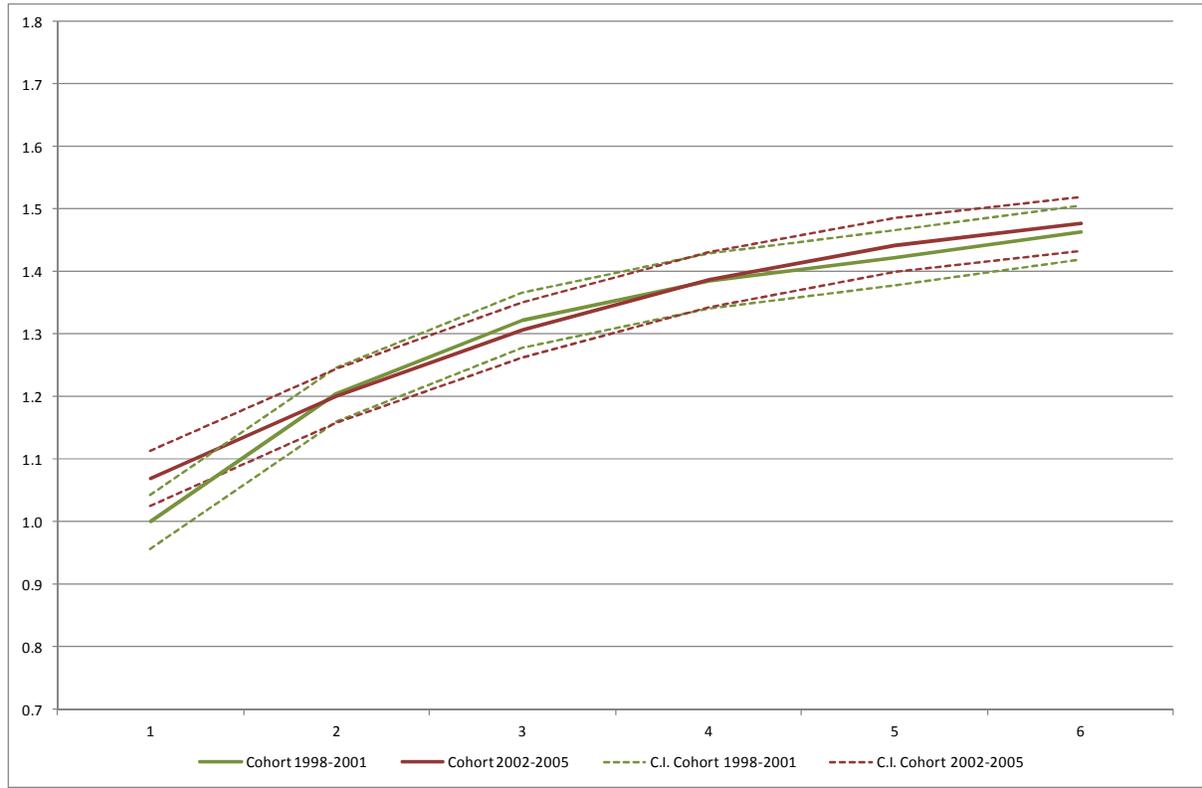
<sup>a</sup> Predicted values from OLS estimates on gross log weekly wages of the term  $\hat{\beta}_j * Cohort_{ij} + \hat{\gamma}_j * Distance_{ijt} * Cohort_{ij} + \hat{\delta}_j * Distance_{ijt}^2 * Cohort_{ij} + \hat{\eta}_j * Distance_{ijt}^3 * Cohort_{ij}$ , expressed relatively to the earnings in the starting year of the cohort 1998-2001. Control variables included in the regression: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, worker's type (private employee vs parasubordinate worker). Source: computations on AD-SILC data

Fig. 4B: OLS estimates of annual earnings by graduation cohort in the six years following the graduation. Private employees<sup>a</sup>



<sup>a</sup> Predicted values from OLS estimates on gross log weekly wages of the term  $\hat{\beta}_j * Cohort_{ij} + \hat{\gamma}_j * Distance_{ijt} * Cohort_{ij} + \hat{\delta}_j * Distance_{ijt}^2 * Cohort_{ij} + \hat{\eta}_j * Distance_{ijt}^3 * Cohort_{ij}$ , expressed relatively to the earnings in the starting year of the cohort 1998-2001. Control variables included in the regression: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square. Source: computations on AD-SILC data

Fig. 4C: OLS estimates of annual earnings by graduation cohort in the six years following the graduation. Private employees. Full covariates <sup>a</sup>



<sup>a</sup> Predicted values from OLS estimates on gross log weekly wages of the term  $\hat{\beta}_j * Cohort_{ij} + \hat{\gamma}_j * Distance_{ijt} * Cohort_{ij} + \hat{\delta}_j * Distance_{ijt}^2 * Cohort_{ij} + \hat{\eta}_j * Distance_{ijt}^3 * Cohort_{ij}$ , expressed relatively to the earnings in the starting year of the cohort 1998-2001. Control variables included in the regression: regional fixed effects, regional unemployment rate, gender, graduation age and its square, experience before graduation and its square, dummies about the type of contractual arrangements for employees plus the interaction between the cohort dummy and the dummy on fixed-term employment arrangement, searching time for the first job after graduation and dummies on class of firm size and sector fixed effects. Source: computations on AD-SILC data