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A FIRST IMPACT
EVALUATION OF THE
ITALIAN DIGNITY
DECREE'S EFFECTS ON
YOUNG WORKERS

Nicola Caravaggio



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A first impact evaluation of the Italian Dignity Decree's effects on young workers*

NICOLA CARAVAGGIO^{a,†}

^a*University of Molise, Campobasso - Italy*

[†]nicola.caravaggio@unimol.it

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Abstract

The so-called Dignity Decree (DD), entered into force in summer 2018, represented one of the main legislative interventions of employment protection within the Italian labor market. The aim of this work is to evaluate the impact of DD on the career paths of young workers (15-29) recently entered in the labor market. Specifically, we focus on their probability of being employed after 1 year or more from the implementation of DD as well as the probability of reaching an open-ended contract within the same time horizons. The analysis relies on an exclusive sample of Compulsory Communications data using a Propensity Score Matching estimation. Results show a poor effect of the reform in boosting the persistence in the labor market. Nonetheless, the positive impact is more pronounced when focused on the probability of being employed with an open-ended contract, which increased by 2.3% after one year.

Keywords: Italian labor market, Dignity Decree, Employment, Propensity Score Matching

JEL Classification: J080, J210, C550

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I Introduction

Since the early nineties, the Italian labor market has embarked a profound path of reforms aimed at aligning it to the European labor market. With the Italy's entrance within the European Monetary Union (EMU) in 1992, followed the necessity to reduce the inflation rate. Therefore, in the following year the Italian government signed an agreement with contractors and trade unions aimed at shrinking the inflationary spiral. However, of the various policies which characterized the so-called "1993 July agreement", that of wage moderation became the one actually applied (*e.g.*, Sestito and Rossi, 1995; Lilla, 2005; Tronti, 2005; Tridico, 2015).

Afterward, in order to align with the new European framework, the Italian labor market has been profoundly modified by introducing much more flexibility within it. First the so-called "Pacchetto Treu" (L. 196/1997) and then the Biagi's law (L. 30/2003) represented two of the most important reforms in that sense. Those legislative interventions represented the Italian response to the European employment strategy framework of 1997, subsequently converged within the Lisbon strategy of 2000, first, and the Europe 2020 strategy of 2010, after. European countries were then channeled through a dichotomous path named *flexicurity*, where a reduction of labor market's rigidity counterbalances an increase of worker's social securities. Therefore, new forms of atypical jobs with low level of protection were introduced in Italy—but leaving intact the protection rule scheme for permanent contracts (Pinelli et al., 2017).

After this first round of interventions, in 2012 the Fornero's reform (L. 92/2012) introduced more flexibility on both hiring and dismissal sides also providing compensation funds for specific categories of layoffs. Nonetheless, these measures left substantially unchanged the segmentation between workers with permanent contracts, characterized by high employment protection, and those with temporary contracts, with low employment protection, on the contrary (Liotti, 2020). The subsequent Poletti's decree (D.L. 23/2014) highly boosted the use of fixed-term contracts by extending their duration and favoring their reiteration. The Jobs Act reform that followed, implemented by a center-left government, attempted to reduce the segmentation among Italian workers in different ways: it eased young workers' entrance in the labor market; it removed article 18 from the labor's chart, hence reduced the number of workers covered by the previous protection system by also limiting the possibility of their reinstatement. Accordingly, a new type of open-ended contract with "increasing protections" has been introduced (*i.e.*, *contratto a tutele crescenti* – CTC) (Pinelli et al., 2017). Furthermore, the reform also provides unemployment benefits for specific contracts. Nonetheless, while the Jobs Act aimed at reducing the

plethora of flexible work contracts in favor of the new CTC, results of this reform have been allegedly limited and mostly driven by monetary incentives (Cirillo et al., 2017).

With the assignment of a new government in June 2018 led by the M5S-Lega coalition, the Italian labor market has been shaken one more time. In fact, one of the main legislative interventions of the newly established government has been the so-called “Dignity Decree” (hereafter DD), announced on June 16th, 2018, the approved as legislative decree on July 12th (D.l. 87/2018)—effective as of July 14th—and then into law on August 9th of the same year (L. 96/2018). The reform—arose in strong opposition with the previous Jobs Act—aimed at fighting precariousness in the Italian labor market, therefore to discourage an excessive recourse to fixed-terms contracts. However, interventions in the decree involved also areas not related to the labor market (*e.g.*, contrast to corporate reallocation and to gambling addiction, reduction of firm-related bureaucracies).

The purpose of this work is to conduct an impact evaluation of the DD on young workers (15-29 years) careers. More precisely, we attempt to evaluate whether the introduction of fixed-term contracts’ limitation increased the persistence—*i.e.*, remain employed—of these workers in the labor market after specific time frames. The analysis relies on an exclusive sample of Compulsory Communications (Comunicazioni Obbligatorie – CO) data which also includes contracts pledges by employment agencies, hence able to catch the entire labor demand in Italy. The evaluation, conducted through the use of a Propensity Score Matching (PSM) technique, shows how the DD increases about 1% the probability of you workers to be employed after one year from the entry into force of the reform. This positive outcome is higher, about 2.7%, for the probability of being employed, after one year, with an open-ended contract.

The reminder of the paper are organized as follows. The next Section II analyzes in detail the DD reform in light of the corresponding labor market context providing an essential background for the proposed analysis. Section III describes the data and the methodology adopted while results fo the analysis are reported and discussed in Section IV. Eventually, Section V concludes the article.

II Background

With the global economic crisis of 2008, first, and the subsequent European sovereign debt crisis, after, mostly all countries in the old continent experienced an increase in unemployment rate due to repercussion of these shock within national and international labor markets (Figure 1a). Within the EU 27 the rate (age class 15-74) moved from 9.3% of 2009 up to 11.6% of 2013—an increase of 2.3 percentage

points—with the only exception of Germany whose rate continued along a decreasing path. Among PIIGS countries Spain and Greece were those that suffered the most from the crisis, with rates that exceeded 26%. In Italy the peak has been reached in 2014—much later than the other countries considered—when the unemployment rate reached 12.9%. After 4 to 5 years from the overspread of the financial crisis, the European labor market entered in a phase of continuous decrease in unemployment rates until the global pandemic crisis arrived in 2020.

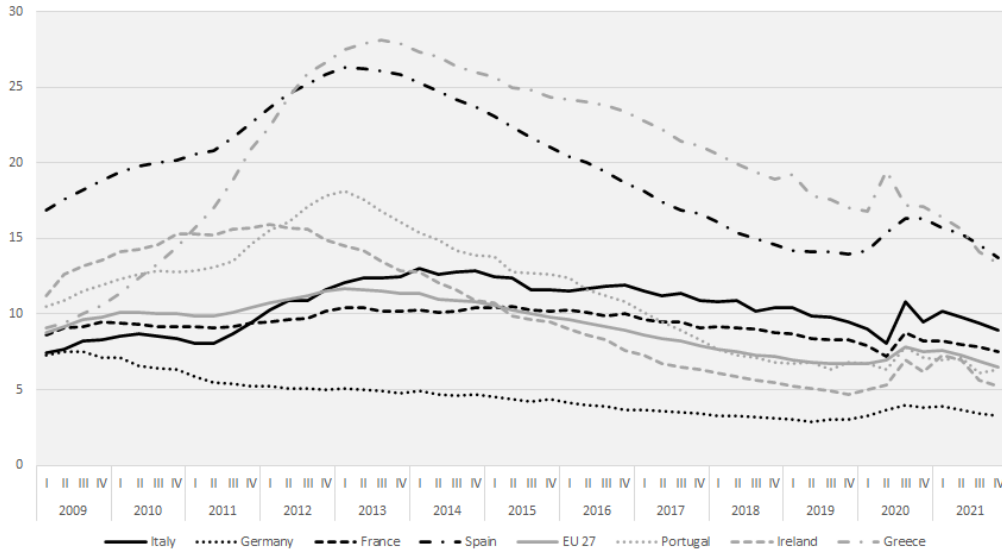
Young workers between 15 and 29 years (Figure 1b) showed higher unemployment rates, reaching in 2013 49.1% and 42.4% for Greece and Spain, respectively. Conversely from the entire labor market, Italy represented the third country in terms of unemployment rates for young workers with a peak of 31.9% achieved in 2014. In fact, here the labor market is highly segmented between young and adult workers as showed by Liotti (2020) who demonstrates how the economic downturn has a detrimental effect mostly on young worker between 15 and 24 years. Structural weakness of the Italian labor market, especially related to young workers, are also stressed by Cirillo et al. (2017). Nonetheless, the flexibility introduced along the years is also interpreted as a route to address this fragility since temporary contracts are expected to facilitate the entrance within the labor market for young workers (Barbieri and Scherer, 2009).

The picture emerged from Figures 1a and 1b clearly show how the European labor market is characterized by huge disparities between youth and total unemployment (OECD, 2021; ILO, 2022a,b). These differences, which can more generally be found in all industrialized countries, escalate especially in correspondence with the recessions periods. In fact, during crisis, young workers are those who pay the higher costs after these occurrences (Verick, 2009; Scarpetta et al., 2010), with effects that may persist up to five years after the outbreak of the crisis (Choudhry et al., 2012). Nonetheless, during the pandemic crisis young people experienced the sharpest decline in employment (Weber et al., 2021).

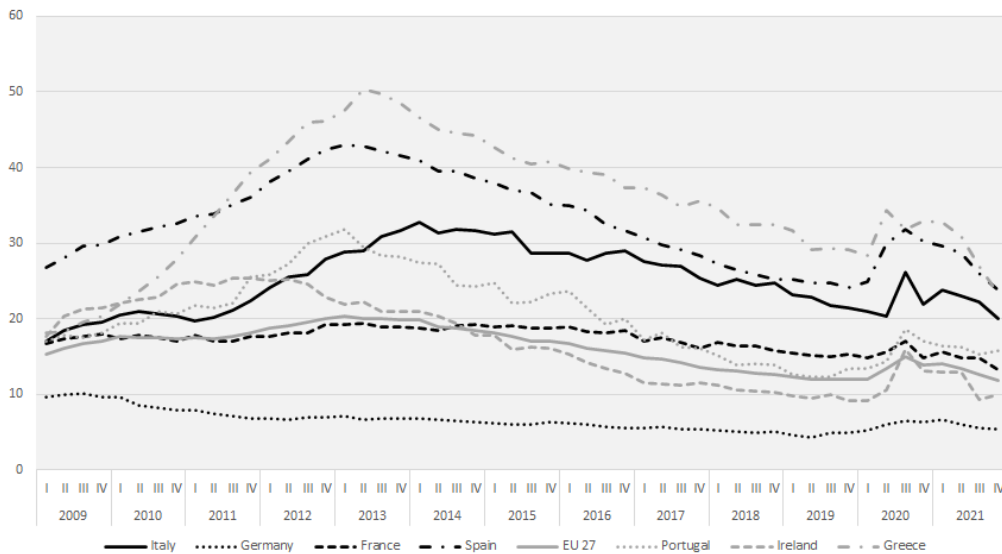
2.0.1 Flexibilization, employment protection, and youth (un)employment

Young employment is generally associated with temporary contracts and precariousness, hence DD's objectives should provide positive effects especially to this group of workers. Three specific characteristics, or rather weaknesses, for this group—in opposition to adult employment—could be gathered from literature: (i) greater sensitivity to the economic cycle (O'higgins, 1997; Tomić, 2018); (ii) the fact that in case of recession, due to their low work experience, higher propensity in being employed through fixed-term contracts and the low firms' cost-opportunity they are the first

Figure 1: *Unemployed workers as percentage of reference labor force for selected European countries (2009–2021, quarterly)*



(a) *Age class 15-74*



(b) *Age class 15-29*

Source: Author's elaboration based on Eurostat (2022).

to be fired (Choudhry et al., 2012; Demidova et al., 2015); (iii) the possibility, with prolonged periods of unemployment, of a discouragement effect leading young workers to become inactive, hence fostering the NEET (not in education, employment or training) phenomenon (Bynner and Parsons, 2002; Bruno et al., 2014).

Nonetheless, other characteristics could be found in the literature, for example related to the specific case of youth unemployment in Europe: (i) increased labor market flexibility which hamper job stabilization; (ii) expansion of education, skill, and qualifications mismatch; (iii) youth migration; (iv) family legacies; (v) European policy initiatives (O'Reilly et al., 2015).¹

Labor market flexibilization is considered one of the core determinants of youth unemployment which result to be employed largely through temporary contracts, making them the first to be replaced by companies in times of need (Stewart, 2007; O'Reilly et al., 2015). Nonetheless, the mainstream approach which corroborate labor market's deregulation opposes this view claiming how higher rates of unemployment would be only temporary after shocks, leading to a fast supply-demand adjustment, instead.

The reforms which lead to a more flexibility within the European labor market through a higher deregulation, follows the mainstream approach based on the explanation of unemployment through the NAIRU (Non-accelerating inflation rate of unemployment). Following this pattern, higher deregulation reduces unemployment by lowering labor market frictions and speed up its adjustment after economic shocks (*e.g.*, Siebert, 1997; Di Tella and MacCulloch, 2005; Lucifora et al., 2005; Forteza and Rama, 2006; Zemanek, 2010). The resulting reforms lowered the degree of employment protection (EP) for workers and facilitated the possibility for young workers to find a job and to firm to adjust their demand in line with the business cycle through the introduction of atypical contracts and the reduction of both hiring and firing costs. According with Bernal-Verdugo et al. (2012), while in a recession phase countries with a less rigid labor market tend to experience higher level in unemployment, in the long run this higher flexibility has a positive effect on employment. Analyzing data from OECD countries from 1960 to 1990 Nickell et al. (2005) show how labor market rigidities were positively correlated with unemployment rate.

Within this framework, regarding young workers, a stringent EP legislation has negative effects on youth entry into labor market according to a study conducted by for OECD economies (Bassanini and Duval, 2006). Furthermore, rigid employment laws are associated with high unemployment especially for young workers (Botero

¹Further drivers of youth unemployment for the specific European case could be retrieved in the work of Tomić (2018) where, among other drivers already mentioned we can find; low GDP growth, low share of construction activity, and high public debt.

et al., 2004) while Breen (2005) stresses how countries with more flexible labor markets have lower levels of youth unemployment.

By looking at the Portugal case, the work of Cahuc et al. (2022) evaluates the effect of the 2009 reform which restricted the use of fixed-term contracts. Their results show how while the reform effectively reduced temporary contracts, it did not increase permanent jobs. Furthermore, the EP introduced by the reform slightly reduced aggregate employment also with negative welfare effects for both employees and unemployed workers. Still within the Portuguese context, Martins (2021) evaluates an opposite scenario or rather whether fixed term contracts represented a tool able to promote employment during downturns periods. The author examined a national law which extended the use of flexible contracts during the 2012 recession period by extending their maximum duration from three up to four and half years. Results show how contracts' extensions have been preferred to conversions to open-end contracts, dropped by 20%, instead. Moreover, worker churning and mobility was reduced while employment increases, but only for younger workers. Generally, the work of Martins (2021) demonstrates how during recession fixed-term contracts' flexibilisation promotes employment representing a tool able to minimize employment fluctuations during recessive phases of the business cycle.

By analyzing a sample of Italian firms active in 2006 during the period 2001–2009,² Hijzen et al. (2017) show how EP accounted for about 12% of total temporary work. Furthermore, their analysis stressed also how EP increases workers turnovers as well as an inevitable reduction in their productivity. Those results were in line to what showed for the French case by Blanchard and Landier (2002) and in the model of proposed by Cahuc and Postel-Vinay (2002).

Nevertheless, other contributions cast doubts about the effectiveness of labor market deregulation in halting unemployment (*e.g.*, Krishna Dutt et al., 2015; Brancaccio et al., 2018). For example, over 21 countries in the post crisis period (2008–2012), Ferreiro and Gómez (2018) conclude that higher and lower flexibility were not associated with better and worse permanent employment outcomes, respectively. Along a similar time-arch (2008-2014) deregulation is also found to decrease employment rates and increase unemployment rates in developed countries (Adascalitei and Morano, 2015). Another study conducted by Liotti (2022) over 28 European countries between 2000 and 2018 concludes that labor flexibility did not help those countries in reducing their youth unemployment rates. For the Spanish case, the large liberalization in the use of fixed-term contracts of 1984 has been investigated by García-Pérez et al. (2019) showing a differentiated effect of those contracts on low-skilled youths' work

²Before the Fornero's reform of 2012 the Italian labor market was characterized by a greater disparity in the EP's degree between firms above and below the threshold of 15 employees.

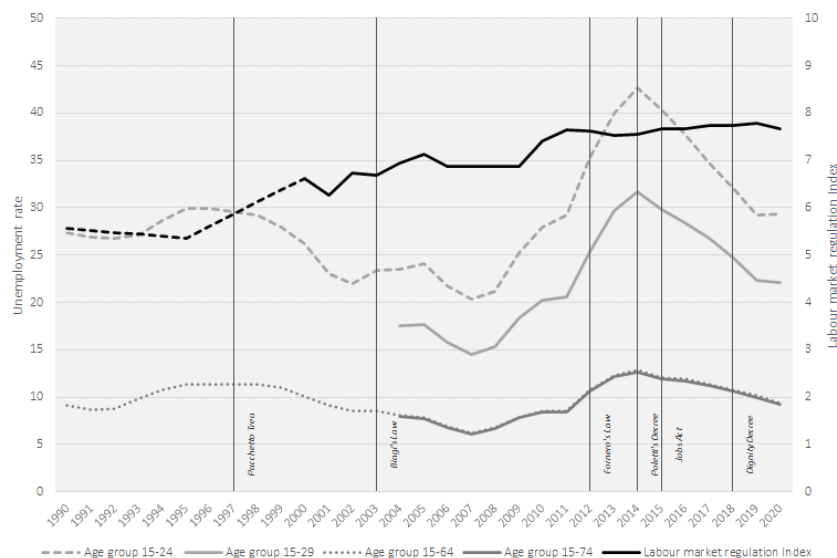
paths. While in the short-run fixed-terms contracts helped those workers in finding a first job, in the long-run the reform reduced both the number of days worked (-4.5%) and earnings (-9%). For the specific Italian case the works of Barbieri and Scherer (2009) and Liotti (2020) show no evidence that higher labor market flexibility would improve youth employment.

Therefore, what is generally identified as "IMF-OECD Consensus" (Howell, 2004), where labor market deregulation increases employment and reduces unemployment, does not seem, even for the specific Italian case, to represent a necessary truth. In fact, a meta-analysis conducted by Brancaccio et al. (2018) over 53 academic paper, shows how only 28% corroborate the consensus approach. For sure, great attention should be paid to what kind of stiffness are smoothed or toughen since they effect on labor market outcomes would be highly different (Nickell, 1997).

Eventually, still within the debate between employment flexibilization and protection, another element which affects youth employment is represented by minimum wages. In fact, Gorry (2013) demonstrates how higher minimum wages negatively impact both the ability of young workers to gain experience as well as their ease of entry within the labor market leading also to increases in youth unemployment. Evidences from the work of Neumark and Wascher (2004) suggests how minimum wages have a dis-employment effect for young workers, in particular for countries with higher flexible labor market; hence, this effect could be smoothed—according with the authors—through EP laws. In fact, the study of O'higgins and Moscariello (2017) found that an increase in the minimum wage within a context of high employment protection does not lead to an increase in unemployment rate.

2.0.2 Evolution of the Italian labor market and characteristics of the Dignity Decree

Figure 2: *Unemployment rate and Labor market regulation index in Italy (1990–2020)*



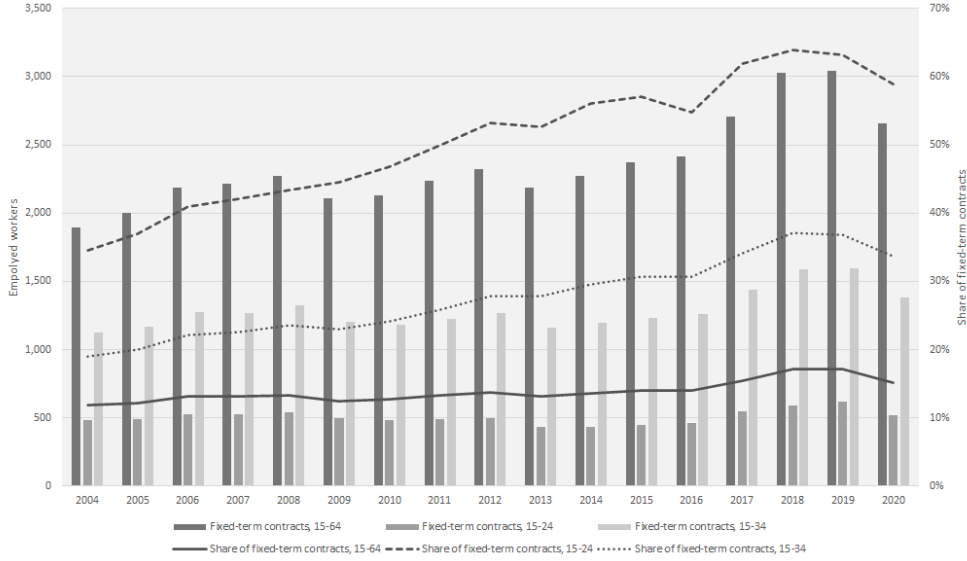
Source: Author's elaboration based on Fraser Institute (2022) and Istat (2022).

To better understand the evolution of the Italian labor market since its entrance within the EU, Figure 2 show the national unemployment rate over 20 years, starting from 1990, along with the Labor market regulation index (LMRI), able to capture the labor market deregulation's degree³. The LMRI shows a continuous increasing pattern over time, in line with the main labor market reforms which provided more flexibility within the Italian labor market until the achievement of a plateau in correspondence with the introduction of the DD, in 2018. In this year the unemployment rate was equal to 10.6% (age class 15-74) while that for young workers (age class 15-29) to 24.8%. In the following year they decreased to 10.2% and 22.4%, respectively. Therefore, the DD clearly was introduced along a period of positive years for the labor market in terms of unemployment rates—with a stable amount of inactive population until the mid-2019—, also favored by a positive phase of the business

³This index, provided by the Fraser Institute (2022), is an unweighted average of six different indicators: 1) hiring regulation and minimum wage; 2) hiring and firing; 3) collective bargaining; 4) hours regulations; 5) mandated cost of worker dismissal; 6) conscription. Its value ranges from 1 to 10 with increasing levels of flexibility in the labor market

cycle, abruptly interrupted in the first quarter of 2020 by the lockdown measures adopted to counter the spread of the Covid-19 virus.

Figure 3: *Employed workers with fixed-term contracts in Italy (2004–2020)*

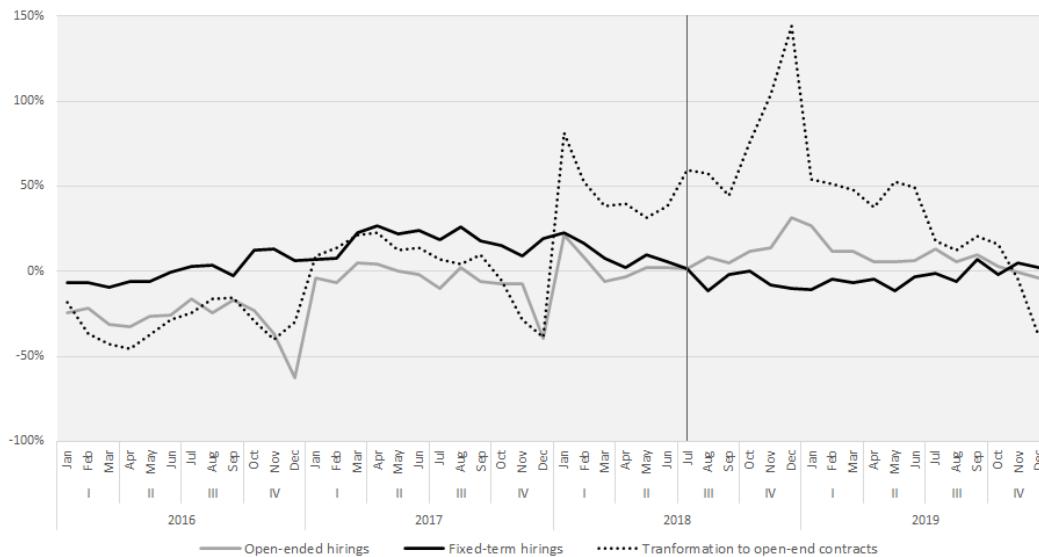


Source: Author's elaboration based on Istat (2022).

Because the primary goal of the DD was to tackle precariousness, Figures 3⁴ and 4 provide some general evidence of how the labor market effectively responded to this reform. The amount of workers employed with fixed-term contracts, whose trend had always grown starting from 2014, stopped between 2018 and 2019. Similarly, even the share of employed workers with a fixed-term contracts followed a similar pattern remaining stable around 17.1% in both 2018 and 2019. Furthermore, by looking at the trend variation in hiring, after the introduction of DD fixed-term contracts continued to register negative percentages, conversely to open-end hiring. For example, in the fourth quarter of 2018 the number of direct open-end hiring were 17% greater than those recorded in the same quarter of the previous year. Similarly, fixed-term hiring were 5.3% lower. Moreover, a large plethora of employers have resorted to fixed-terms transformations during the last months of 2018 probably due to the supervening impossibility of further extending those contracts.

⁴Data for the age group 15-29 is available only starting from 2018. Henceforth, for the seek of graphical representation the age class 15-34 has been preferred.

Figure 4: *Trend variation in hiring by contract type and fixed-term transformations (2016–2019, monthly)*



Source: Author's elaboration based on CO data.

The interventions of the DD in the labor market could be grouped into two macro categories: 1) limitations in the use of fixed-term contracts; 2) limitation to unjustified dismissals. Regarding the first and most substantial group of interventions which represented the reform's core, the DD reform introduced several modification to temporary—no seasonal—contracts regulation in strong opposition with the previous Poletti's decree. The maximum duration for fixed-term contracts changes from 36 down to 24 months while the maximum number of extensions reduced from 5 down to 4. Furthermore, after the twelfth month, fixed-term contracts can be extended only through specific motives (*i.e.*, *causalità*): i) temporary and objective needs, unrelated to ordinary activities, or replacement of other workers; ii) needs related to temporary, significant and non-programmable increases in ordinary activity. These motives also apply for the renewal of fixed-term contracts after 12 months and they also become more onerous for employers due to a NASpI⁵ tax rate increase. Eventually, the DD clearly specify how provisions envisaged for fixed-term contracts also concern those with temporary employment agencies (*i.e.*, *agenzie di somministrazione*). Limitations in the use of temporary contracts were introduced

⁵NASpI stands for *Nuova Assicurazione Sociale per l'Impiego*, a monthly unemployment benefit introduced with the Jobs Act (D.L. 22/2015).

also through specific quota limits (*i.e.*, *limiti di contingentamento*) in the hiring of fixed-term workers in the company workforce: up to 20% of workers with fixed-term contracts and up to 30% with the inclusion of workers hired through temporary agency work contracts.

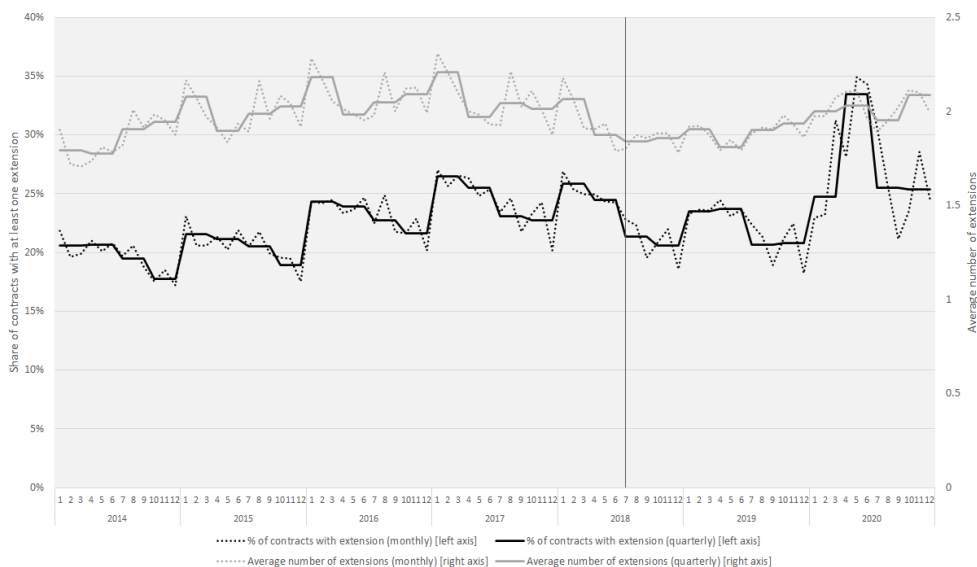
Eventually, the second group of interventions aimed at contrasting the ease of layoffs introduced with the new open-end contracts of the Jobs Act. The DD, in fact, modified the economic allowance for unjustified dismissal (ascertained by a judge) with the maximum limit of monthly payments moved from 24 up to 36.⁶

The DD was also accompanied by another important intervention that is the institution of a basic income (*i.e.*, *reddito di cittadinanza*) (D.L. 4/2019). The beneficiaries—1.8 million of families over a potential audience of 3 millions (Bergamante et al., 2022)—of this subsidy are individuals belonging to households with low incomes associated with a conditional system of labor market reintegration.

The effect of the DD on fixed-term contracts' extensions could be deduced from Figure 5 that shows the share of temporary contracts with at least one extension and the average number of extensions per contract. Although temporary contracts and their extension are highly affected by seasonality, it is clear of how the introduction of the DD led to an abrupt decrease both in terms of extended contracts as well as in the number of extensions. Since the second quarter of 2018, when the reform had not yet been legislated but only announced, the share of extended fixed-term contracts decreased by 4% compared with the corresponding quarter of the previous year. With the third and fourth quarter the decrease was even larger, with -7.4% and -9.5%, respectively. Even with the first quarter—the one seasonally characterized by the highest number of extensions—of 2019 the trend variation was negative, equal to -9.2%. As concern the average number of extensions, during the second quarter of 2018 they were equal to 1.87, -4.9% compared with second quarter of previous year. The trend variation further decrease to -9.9% during the third quarter while remained equal to -7.7% for the fourth quarter of 2018 and the first of 2019.

⁶Subsequently, the sentence n.194/2018 of the Italian constitutional court further increased the employment protection legislation concerning open-end contracts by in terms of higher firing costs. The legislator's intervention has ratified that dismissal's compensations must be granted not only on the basis of the worker's seniority but also based on other elements such as equality and reasonableness criteria.

Figure 5: *Fixed-term contracts and their extensions (2014–2020, monthly)*



Source: Author's elaboration based on CO data.

While several works attempted to investigate the effect of the Jobs Act reform (*e.g.*, Cirillo et al., 2017; Fana et al., 2017; Sestito and Viviano, 2018; Boeri and Garibaldi, 2019; Berton et al., 2022), the literature concerned the DD reform is relatively scant. Certainly the pandemic crisis that spread less than two years after shifted the general attention to studies focused on the impact of the global health crisis on national and international labor markets. Studies focused on the DD mainly investigate legislative aspect of this reform with a particular focus on temporary employment agencies' contracts, now equated to directly subordinate fixed-term contracts (*e.g.*, Passalacqua, 2018; Ferrara, 2019). However, a rather critical and skeptical picture emerges about the effective possibilities of the DD to pursue its ambitious contrast to the precariousness. For example, Sartori (2018) stresses how the reform, hastily conceived, dangerously equates flexibility with precariousness and results may lead to work stagnation and excessive turnover of fixed-term workers, especially those low-skilled.

While Nannicini et al. (2019) carry out a political evaluation of the previous Jobs Act as well as of the main government interventions of the M5S-Lega coalition, with particular reference to the DD, one of the few works to offer a quantitative evaluation of the DD was conducted by the Centro Studi di Confindustria (Labartino and Mazzolari, 2019). The authors highlighted some interesting outcomes for the first half of 2019: i) results from a survey conducted on a sample of (4,000) companies

showed that in 50% of cases they expected a reduction in the use of fixed-term contracts. However, this was not accompanied by a necessary increase in permanent contracts (almost 19% of the companies would have opted for turnover with fixed-term contracts); ii) starting from July 2018 (and different from previous years), the number of workers with fixed-term contracts has remained stable (and this could be explained also by the responsiveness of temporary employment to the cycle) while the number of permanent workers has remarkably increased. This growth was greatly supported by the transformations of fixed term contracts into open-ended contracts. However, as early as mid-2019 that growth had faded, suggesting that the effects of DD were wearing off; iii) in the second half of 2018, fixed-terms hiring flows decreased, especially for temporary contracts. However, this reduction could have, in future, some side effects: a reduction today in the number of short-term contracts activated will lead tomorrow to a smaller pool of workers who can be potentially transformed from fixed-term to permanent positions.

Recently, the work of Palladino and Sartori (2023) investigates the impact of DD on firms' side analyzing the Veneto region and stressing out three major outcomes. First, the reintroduction of contracts' *causalità*, a reduction of fixed terms contracts lasting more than one year emerged side by side with a rise in similar contracts with a duration of less than one year or one month. Second, an increase in new direct open-end jobs as well as transformation of longer fixed term contracts. Third, a heterogeneity response of firms to the reform where the larger ones have been more interested in permanent hiring and transformations, especially in the manufacturing sector.

III Data and methodology

The following analysis relies on the use of an exclusive sample of Compulsory Communications (CO) data provided by the Italian Ministry of Labor and Social Policies (MLPS). Through this source, the aim of this study is to evaluate the impact of DD on young workers (15-29 years) recently entered in the labor market, in particular on their probability of being employed after 1 year or more from the implementation of the reform as well as the probability of reaching an open-ended contract within the same time horizons.

As stressed by O'higgins (1997), the definition of young workers—and their relative unemployment—depends on a plethora of national, political, and cultural factors. Usually national statistics tend to consider as youth those worker in the age group between 15—the minimum age to legally be able to work and be employed—and 25. Nonetheless, the proposed analysis enlarges this category including workers

up to the age of 29. In fact, workers in the age group 15-24 that have undertaken a university career would allegedly be employed mostly in seasonal and temporary contracts aimed at sustain their income and pay for their education. As a matter of fact, the average graduation age is equal to 25.7 years (24.5 years for first-level graduates, 27 for single-cycle master’s graduates and 27.1 years for two-year master’s graduates) (AlmaLaurea, 2022). Therefore, considering only workers up to 24 years would preclude the possibility to properly observe graduated workers in their pattern to job stabilization. Furthermore, by extending the age group up to 29 years would allow to consider the whole pool of workers employable through apprenticeships contracts which potentially represents a roadway to work stabilization (Inapp et al., 2021).

Therefore, while the first reason that justify the focus only on the age group 15-29 is mainly attributable to the highly proneness of this group to precariousness—hence those that should potentially benefit the most from the DD reform—, the second reason is associated to the specific characteristics of the data source used.

CO data is composed by all communication that private and public employers have to provide on a monthly basis to MLPS concerning all new hiring as well as extensions, transformations, terminations of any employment relationship.⁷ This system has been established starting from 2008 (D. Interm. October 30, 2007) becoming effectively operational throughout the entire national territory only in 2009. By including all subordinate, para-subordinate employment relationships as well as temporary working agencies contracts, CO data is able to capture the entire demand of the Italian labor market.⁸ Therefore, due to this characteristics it represents a pure flow variable, unable to identify, for example, the effective stock of employed workers in a specific reference period.⁹ However, with the necessity to use a stock of workers for the analysis, this is possible only by considering young workers from what presumably represents the first activation in their work history (first occurrence in the CO system) and thereafter. Eventually, also data characteristics lead to narrow the only on young individuals, hence representing a third reason for our choice to consider only workers between 15 and 29 years.

We evaluate the effect of DD on the probability of being employed identified as

⁷The CO sample used was updated to the second quarter of 2022.

⁸Data has been properly checked and an extensive work aimed at limiting administrative errors has been conducted. Additional information about the procedure adopted to process CO data could be found in methodology appendices of quarterly report carried out by the outlook on temporary agency work *Il lavoro in somministrazione in Italia* held by the School of Economics of Roma Tre University, Rome.

⁹For example, a worker hired through an open-end contract before 2008 which has not changed ever since, may allegedly not appear in the CO system.

a dichotomous variable Y_{t+s}^{DD} for each individual i at time $t + s$ conditional on the specific policy (DD). If the individual is employed the variable is equal to 1 and 0 otherwise. Therefore, the causal effect of DD would be identified as the difference in the expected proportion of workers employed at time $t + s$ with and without the policy (equation 1):

$$E\{Y_{t+s}^1 - Y_{t+s}^0 | DD = 1\} = E\{Y_{t+s}^1 | DD = 1\} - E\{Y_{t+s}^0 | DD = 1\} \quad (1)$$

where t is equal to July 14 and s refers to the outcome variable observed after specific time horizons (from 90 days up to 2 years). However, since it is not possible to estimate $E\{Y_{t+s}^0 | DD_i = 1\}$, we have to construct a counterfactual against which the impact of the intervention can be evaluated. Therefore, for each treated individual i , we have to identify its counterfactual at time $t + s$ without the DD.

To do this, we identified two groups of workers: (i) the group of treated, the workers affected by the introduction of the DD; and (ii) the control group, the workers not allegedly affected by the decree. The first group was constructed by identifying all workers aged between 15 and 29 years that entered the labor market from six to three months prior to July 14, 2018 (20,569 individuals).¹⁰ Similarly, the control group was identified with workers who entered the labor market from six to three months prior to July 14, 2016 and July 14, 2017, respectively (39,596 individuals). Figure 6 shows the cumulative number of workers entered in the labor market for each year from 2016 to 2019.¹¹ The select individuals for the two groups fall within the gray area. The patterns for 2017, 2018 are quite similar while 2016 show a lower amount of young workers entering in the labor market.¹² Nonetheless, the analysis

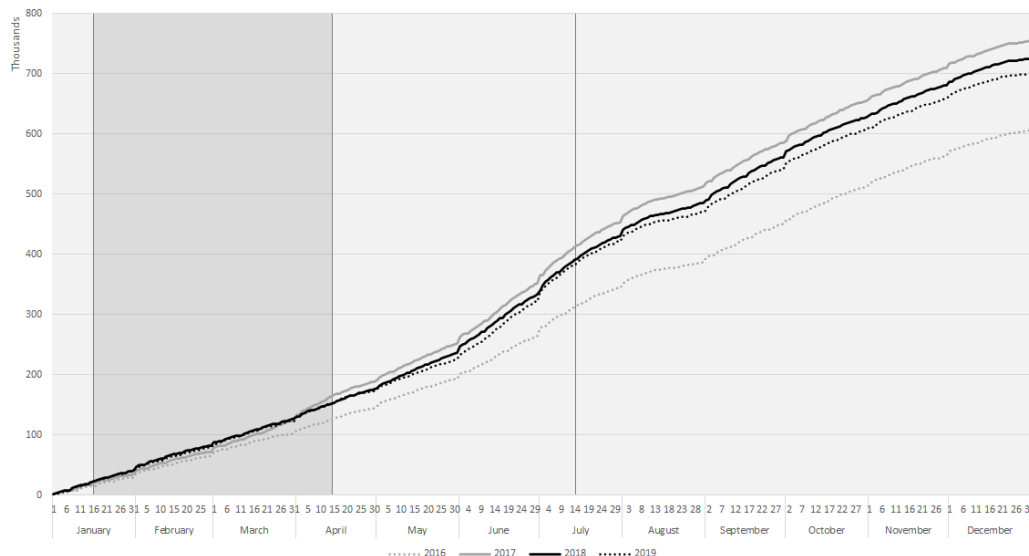
¹⁰The choice not to consider workers who entered the labor market too close to 14 July is twofold. Firstly, in order to identify the covariates in the analysis that follows, there was a need to be able to observe the career paths of young people for at least a few months. Secondly, it is presumable that the greatest impact of the reform has concerned workers already present in the labor market. Eventually, workers who died before July 14 of the corresponding year of entry into the labor market have been discarded.

¹¹Young workers entered in the labor market in 2019 were not considered for the purposes of the analysis. They are only reported in Figure 6 for completeness, also to show how the stock of workers entered in the labor market in this year, after the DD reform, where substantially in line with those of the previous two years, albeit decreasing.

¹²Also for the years 2014 and 2015 the trends of young workers (age class 15-29) entered in the labor market are similar to what observed for 2016. The difference with the subsequent years is probably associated to the presence of vouchers which represented the the least onerous employment contract for employers. These ancillary work contracts, introduced by the D.Lgs. 276/2003 and revised with the D.Lgs. 81/2015, were completely removed in April 2017 (D.Lgs. 25/2017). Therefore, since vouchers were not accounted for by the CO system, it is expected that several young workers effectively entered in the labor market through vouchers before 2017 but were accounted in

only considers individuals that fall into the gray area, where differences among years are relatively limited.

Figure 6: *Number of workers (age class 15-29) entered in the labor market, cumulative values (2016-2019, daily)*



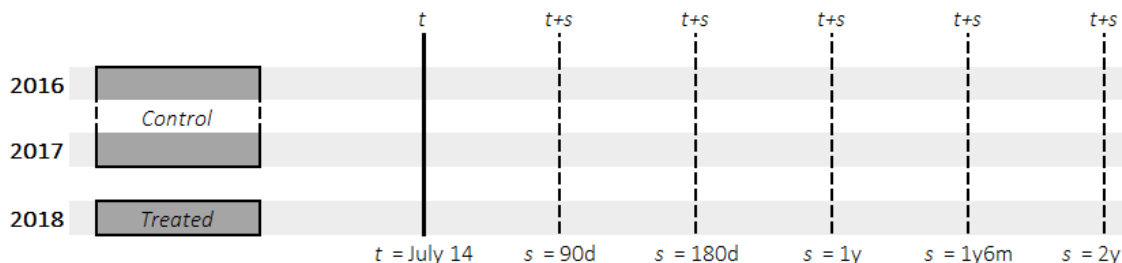
Source: Author's elaboration based on CO data.

In order to assess the causal impact of the treatment (implementation of the DD) on our treated units, we adopted a Propensity Score Matching (PSM) procedure (Rosenbaum and Rubin, 1983, 1985). Through the PSM we construct our unobserved counterfactual by paring each treated worker (entered in the labor market on 2018) with an untreated worker based on a vector of characteristics observed by following the work history of each individual from its entrance in the labor market until July 14 of each reference year.

To better understand the choice of individuals in the two groups of interest, they are identified along a timeline referred to each year under investigation in Figure 7. The threshold t differs for each group of interest as well as the relative values of Y_{t+s}^{DD} in the subsequent periods $t + s$.

the CO system only starting from April 2017 (to notice the slightly jump in the trend corresponding to this month). In fact, vouchers in 2016 involved more than 770 thousand of workers between 15 and 29 years while in 2017 around 285 thousands (Inps, 2022b).

Figure 7: *Identification of treated and control units*



The goal of matching is to produce a covariate balance between the two groups as they would be in a randomized experiment. In this way, it is possible to overcome the issue of selection bias which affects non-experimental method, hence yield to unbiased estimate of treatment impact. In particular, PSM computes the probability that a unit will be treated based on a vector of characteristics: $Prob(DD_i = 1) = F(X_i)$.

The selection of covariates (X_i) to balance, necessary to have a resulting treatment effect estimate free of confounding factors (VanderWeele, 2019), is based on characteristics retrieved directly from CO data. Unfortunately, the source does not provide further information about individuals such as marital status, family unit or earnings. Nonetheless, by following the entire work career of each individual starting from the first work contract, it is possible to enrich noticeably the list of covariates used for balancing. The matching was carried out using 23 covariates (of which 5 categorical):

- 1) gender (**sex**), a dummy variable equal to 1 for female and 0 for male workers;
- 2) citizenship (**citiz**), a dummy variable equal to 1 if the worker was Italian and 0 otherwise;
- 3) graduation level (**study**), a categorical variable divided into low, medium, and high education;¹³
- 4) a geographical variable (**geo**) which refer to the area where each individual worked the most from the first occurrence in the CO system until July 14, divided into 6 categories (North-West, North-East, Center, South, Islands, and N.D.);

¹³This division follows the Eurostat classification where low academic level refers to individuals with at most a secondary school degree (*i.e.*, *scuola media*), medium academic level refers to individuals with at most a high-school certificate (*i.e.*, *diploma*) while high academic level refers to individuals with at least a bachelor's degree (*i.e.*, *laurea*).

- 5) a categorical variable which embodies the mobility of each individual (*mobility*), computed based on the distance between home and work residence for each contract before July 14, divide into 5 categories (Low, Medium-Low, Medium, Medium-High, and High);¹⁴
- 6) age at first hiring (*age_first*);
- 7) type of work contract at the first occurrence in the CO system (*ct_first*), a categorical variable of 7 different work contracts;¹⁵
- 8) type of work contract at July 14 (*ct_dd*), a categorical variable similar to the previous one but with an additional category which account for non employed workers (N.A.);
- 9) number of days between the first occurrence in the CO system and the day July 14 of the corresponding year (*diff_gg_dd*);
- 10) number of stipulated contracts before July 14 (*att_dd*);
- 11) number of working days before July 14 (*gg1_dd*);¹⁶
- 12) a dummy variable equal to 1 if the worker had at least one work experience through a temporary agency work1 before July 14 and 0 otherwise (*mis_dd*);
- 13-15) share of days worked between the first occurrence in the CO system and the day July 14 in agricultural (*gg1_agr_dd*), industrial (*gg1_ind_dd*), and tertiary (*gg1_ser_dd*) sectors as identified by the ATECO classification of Istat;
- 16-23) share of days worked between the first occurrence in the CO system and the day July 14 among the nine macro professional groups (*i.e.*, *grandi gruppi professionali*) as identified by the CP2011 classification of Istat (from *gg1_cp1_dd* to *gg1_cp8_dd*).¹⁷

¹⁴Distances have been computed by calculating the linear distance between the two centroids of the municipality of residence and work. The classes have been identified by considering the quantiles of distances' distribution referred to all hiring occurred between 2016 and 2019 for workers (age class 15-29) entered in the labor market between these two years.

¹⁵The considered contracts are the following: open-end (CTI); fixed-term (CTD), intermittent (INT); apprenticeship (CAP); training (*i.e.*, *tirocinio* – ESP); para-subordinate (PAR); housework (*i.e.*, *lavoro domestico*) and colf (DOM-COLF). The analysis implements a broad view of open-end contract by considering within this category all contracts with no expected fixed end. For example, open-end contracts with temporary work agency fall within this category.

¹⁶The variable refers to days stipulated by contract. In case of overlapping contracts only one single working day has been accounted.

¹⁷The nine professional groups are the following: 1) legislators and managers; 2) highly specialized

The analysis used a 1:1 nearest-neighbors PSM model with *glm* (generalized linear model) as the distance and *probit* regression as the link function.¹⁸ One by one, each treated unit is paired with an available control unit that has the closest propensity score to it. Any remaining control units are left unmatched and excluded. Henceforth, after the matching the number of treated units remained unchanged (20,569) and each of them have been matched with a unit from the pool of controls. Since the size of the control group was almost double that of the treated group, 19,027 resulted unmatched. Eventually, no units resulted discarded by any of the groups.

The post matching results show an optimal balancing between the two groups with no treated units left unpaired. The Standard Mean Difference (SMD) after matching is always less than 0.02 for each covariate, therefore far lower than the level 0.1 as showed by the love plot in Figure 8 in Appendix where the SMD between the two group before and after the matching is reported. Moreover, Variance Ratio is always close to 1 for each non-categorical covariate, another indicator of good balancing. The contribution of the PSM in creating the “as good as random” scenario is clearly confirmed by the distribution of the propensity score before and after the PSM application as showed in Figure 9 in Appendix.

Once conducted the PSM we calculated the ATT (Average Treatment Effect on the treated) (Imbens, 2004) which represents the effect on individuals who have “benefited” from the reform (equation 2):

$$ATT_{PSM} = E_{P(X)|DD=1}\{E[Y_{t+s}^1|DD = 1, P(X)] - E[Y_{t+s}^0|DD = 0, P(X)]\} \quad (2)$$

where the ATT is computed as the difference between expected outcome values with and without treatment for those who actually participated in the treatment. Through the propensity score we identified the counterfactual values for those being treated. A benefit of matching is that the outcome model used to estimate the treatment effect is robust to misspecification when balance is achieved, such as in this case.

professions; 3) Technicians and associate professionals; 4) clerical support workers; 5) service and sales workers; 6) craft and skilled workers (also in agriculture); 7) plant and machine operators, and assemblers; 8) elementary occupations. Note that the professional group of armed forces is excluded from this analysis since it represents a residual class within the CO system; furthermore, no worker analyzed in the period previous to July 14 was found to have had an experience within this professional group.

¹⁸The matching procedure has been performed through the R package `MatchIt`.

IV Results and discussion

Once obtained a properly balanced database, the analysis estimate the ATT over the probability for a young worker (age class 15-29) entered in the market in 2018 (from six up to three months before the implementation of the DD reform) of still being employed after 90 days, 180 days, 1 year, 1 year and six month, and 2 years from the implementation of the DD reform. The regression uses cluster-robust standard errors with matching stratum membership as the clustering variable. In these models two ATT are reported: the first one (1) is obtained through a simple binomial regression where the unique regressor is the treatment dummy variable; the second (2), instead, derives from a regression which includes variables used for the balancing process (not reported) in order to provide additional robustness to some possible remaining imbalances. Results are showed on Table 1 where the test is conducted also for the probability of being employed with an open-end contract. To better quantify the effects of the treatment, the marginal effects or rather risk-difference have been calculated.

Results show how the positive impact of DD on the stability of workers' career has been modest if not absent. The immediate impact, considering a time-span of three months (90 days), led to an increase of 1,6% in the probability of being employed. However, this initial effect decreases after six months (180 days), moving to 0,7%. The effect after one year is even lower as well as not statistically significant while stops to 0,8% after one year and half. Eventually, after two years the probability is equal to -3,1%. However, in this case the negative outcome is mainly associated to the arrival of global pandemic which affected the working career of all employee, especially younger.

While the effect of the DD reform concerning young workers' persistence in the labor market was hardly deductible, regarding the probability of being employed with an open-end contract¹⁹ the results are higher and always statistically significant. After one year, the DD increased the probability of having a permanent contract by 2,3%, an effect which remained the same even after one year and half.

With the same approach other two variables have been tested: the number of activated contracts and the number of working contracted days (without overlapping). Results, reported in Appendix (Table 4), show a slight decrease in the former case and an increase in the latter. These outcomes are in line to what expected. In fact, the implementation of the DD lead to a remarkable decrease in the activation of short-term and very-short term contracts, especially within temporary agency

¹⁹To identify the achievement of an open-end contract, those only lasted one day have been excluded from the analysis.

works.²⁰

Table 1: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later*

Employed														
	90 days		180 days		1 year		1 year and 6 months		2 years					
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>				
ATT (1)	0.0450	0.0124	***	0.0204	0.0124	.	0.0050	0.0124	0.0198	0.0124	-0.0793	0.0124	***	
	<i>0.0175</i>	<i>0.0048</i>		<i>0.0081</i>	<i>0.0049</i>		<i>0.0019</i>	<i>0.0048</i>	<i>0.0078</i>	<i>0.0049</i>	<i>-0.0313</i>	<i>0.0049</i>		
ATT (2)	0.0595	0.0145	***	0.0242	0.0137	.	0.0028	0.0133	0.0232	0.0131	.	-0.0902	0.0131	***
	<i>0.0160</i>	<i>0.0039</i>		<i>0.0075</i>	<i>0.0042</i>		<i>0.0009</i>	<i>0.0043</i>	<i>0.0080</i>	<i>0.0045</i>		<i>-0.0313</i>	<i>0.0045</i>	

Employed with an open-ended contrat															
	90 days		180 days		1 year		1 year and 6 months		2 years						
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>					
ATT (1)	0.0166	0.0153		0.0492	0.0150	**	0.0936	0.0145	***	0.0843	0.0140	***	0.0493	0.0136	***
	<i>0.0036</i>	<i>0.0034</i>		<i>0.0115</i>	<i>0.0035</i>		<i>0.0244</i>	<i>0.0038</i>		<i>0.0239</i>	<i>0.0040</i>		<i>0.0149</i>	<i>0.0041</i>	
ATT (2)	0.0402	0.0229	.	0.0831	0.0191	***	0.1180	0.0167	***	0.1010	0.0153	***	0.0566	0.0147	***
	<i>0.0034</i>	<i>0.0019</i>		<i>0.0111</i>	<i>0.0025</i>		<i>0.0226</i>	<i>0.0032</i>		<i>0.0233</i>	<i>0.0035</i>		<i>0.0145</i>	<i>0.0037</i>	

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 41,138. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

To further validate those results, we excluded from the sample of workers those active with an open-end contract on June 14. After obtaining an optimal balancing with the PSM,²¹ results (Table 2) for the probability of being employed are non statistically significant when considering one year or one year and half. Conversely, when considering the probability of achieving a permanent contract, probabilities increase in both cases by 2.5% due to the affect of DD. Therefore, the boosting effect of the DD in promoting open-end contracts holds also (an more) for workers not previously employed with similar permanent contracts before the implementation of the reform.

²⁰Between 2017 and the first half of 2018 there has been heavy use of short-term contracts through temporary work agency, especially after the vouchers' suppression in April 2017. Nonetheless, after the DD entered into force a huge fall in these contracts followed. The trend in hiring through temporary agency works and its share over the entire demand is showed in Figure 20.

²¹The original sample fro this analysis was composed by 52,351 units (34,316 control and 18,035 treated) and the same matching procedure used for the main analysis has been implemented. The matched sample was composed by 36,070 units equally divided between the two groups. Balancing outcomes of the PSM are reported in Appendix (Figures 10 and 11).

Table 2: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (without considering workers with an active open-end contract on July 14)*

Employed												
	90 days			180 days		1 year		1 year and 6 months		2 years		
	<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	
ATT (1)	0.0442	0.0133	***	0.0171	0.0132	0.0032	0.0133	0.0019	0.0131	-0.0982	0.0132	***
	<i>0.0175</i>	<i>0.0053</i>		<i>0.0068</i>	<i>0.0052</i>	<i>0.0013</i>	<i>0.0052</i>	<i>0.0008</i>	<i>0.0052</i>	<i>-0.0389</i>	<i>0.0052</i>	
ATT (2)	0.0572	0.0152	***	0.0197	0.0144	0.0021	0.0142	0.0030	0.0139	-0.1107	0.0139	***
	<i>0.0161</i>	<i>0.0043</i>		<i>0.0063</i>	<i>0.0046</i>	<i>0.0007</i>	<i>0.0047</i>	<i>0.0011</i>	<i>0.0048</i>	<i>-0.0385</i>	<i>0.0048</i>	

Employed with an open-ended contrat												
	90 days			180 days		1 year		1 year and 6 months		2 years		
	<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	
ATT (1)	0.0526	0.0258	*	0.1092	0.0211	***	0.1480	0.0178	***	0.1143	0.0162	***
	<i>0.0038</i>	<i>0.0019</i>		<i>0.0129</i>	<i>0.0025</i>		<i>0.0268</i>	<i>0.0032</i>		<i>0.0261</i>	<i>0.0037</i>	
ATT (2)	0.0545	0.0267	*	0.1106	0.0220	***	0.1493	0.0187	***	0.1206	0.0169	***
	<i>0.0037</i>	<i>0.0018</i>		<i>0.0123</i>	<i>0.0020</i>		<i>0.0249</i>	<i>0.0033</i>		<i>0.0252</i>	<i>0.0035</i>	

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 36,070. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Because limitations to fixed-term contracts introduced by DD affected also temporary agency work contracts, the same analysis just proposed has been performed only considering young workers who had at least one work experience with temporary work agencies before the treatment period.²² Results are reported on Table 3. Regarding the probability of being employed, after one year the DD has a strong negative impact for this group of young workers. In fact, for those individuals the probability of being employed decreased by 4.2% suggesting that the reform strongly affected the environment of temporary agency work, especially for employed with fixed-term contracts. In fact, as reported in Appendix on Figure 20, after the implementation of this reform, the number of hiring through this institute suffered a sharp contraction.

While the reform seems to have negatively affected the persistence in the labor market for workers within temporary work agencies, when looking at the probability of being employed through a permanent contract, results are quite the opposite. In fact, after one year the those workers are have a 6.6% greater chance of being employed while after one year and half the probability is equal to 4.4%. This positive impact of the reform should be interpreted by looking at how the stock of workers employed in Italy through temporary work agency evolved over time, as showed in

²²By performing this sub-setting, the whole analyzed sample shrank to 4,864 units (1,775 treated and 3,089 control) and the same matching procedure used for the main analysis has been implemented—although here the *logit* link function has been preferred, instead. The matched sample was composed by 3,550 units equally divided between the two groups. Balancing outcomes of the PSM are reported in Appendix (Figures 12 and 13).

Appendix on Figure 21. In fact, established with the purpose to accommodate the cyclical demand of the market through temporary contracts, over time the share of employed with open-end contracts increased over time. Furthermore, in conjunction with the enforcement of the DD, a boost in new activation and fixed-term transformation occurred, a trend that lingered also during the pandemic and post-pandemic period. Eventually, the share of employed workers through temporary work agency with an open-end contract was higher than 20% in 2020 perhaps making the current nomenclature appear slightly outdated.

Table 3: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later for workers who have passed through temporary agency work*

Employed												
	90 days		180 days		1 year		1 year and 6 months		2 years			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>		
ATT (1)	0.0406	0.0428	0.0129	0.0423	-0.1063	0.0433	*	-0.0350	0.0427	-0.1867	0.0437	***
	<i>0.0158</i>	<i>0.0166</i>	<i>0.0051</i>	<i>0.0167</i>	<i>-0.0400</i>	<i>0.0163</i>		<i>-0.0135</i>	<i>0.0165</i>	<i>-0.0704</i>	<i>0.0164</i>	
ATT (2)	0.0451	0.0497	0.0086	0.0457	-0.1362	0.0466	**	-0.0453	0.0449	-0.2130	0.0460	***
	<i>0.0119</i>	<i>0.0131</i>	<i>0.0027</i>	<i>0.0144</i>	<i>-0.0423</i>	<i>0.0144</i>		<i>-0.0154</i>	<i>0.0153</i>	<i>-0.0709</i>	<i>0.0153</i>	

Employed with an open-ended contrat															
	90 days		180 days		1 year		1 year and 6 months		2 years						
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>					
ATT (1)	0.2312	0.0764	**	0.3278	0.0630	***	0.3328	0.0529	***	0.1796	0.0477	***	0.1051	0.0459	*
	<i>0.0208</i>	<i>0.0069</i>		<i>0.0468</i>	<i>0.0089</i>		<i>0.0732</i>	<i>0.0116</i>		<i>0.0507</i>	<i>0.0134</i>		<i>0.0332</i>	<i>0.0145</i>	
ATT (2)	0.2606	0.0924	**	0.3545	0.0704	***	0.3504	0.0580	***	0.1734	0.0510	***	0.0991	0.0485	*
	<i>0.0162</i>	<i>0.0058</i>		<i>0.0416</i>	<i>0.0078</i>		<i>0.0663</i>	<i>0.0107</i>		<i>0.0436</i>	<i>0.0127</i>		<i>0.0279</i>	<i>0.0136</i>	

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 3,550. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

In conclusion, the analysis proposed shows that the DD did not have a substantial effect on the persistence in the labor market of youths after one year and one year and half from the reform implementation. Nonetheless, despite the absence on an effective impact on the probability of being employed, a positive effect emerges when focusing on permanent contracts. In fact, over one year and one year and half the stability for young workers, hence the probability of being employed through an open-end contract, increased by 2.3%. Furthermore, this effect was even greater for workers with an experience through a temporary work agency in the period before the DD went into effect. However, this (partial) positive result should be taken with caution since it occurred along a positive phase of the business cycle, hence results may be partially driven by this effect to which young employment is highly sensitive (O'higgins, 1997). Eventually, the outbreak of the pandemic crisis less than two years after the reform thwarted the possibility to further investigate the impact of the DD over a longer time horizon.

Among the limitations of the current work there is the impossibility to properly consider the effect played by the business cycle due to the fact that the two groups (control and treated) are composed by workers entered in the labor market in different years. For the same reason, also specific government contributions and reliefs established yearly by the Italian government through Active Labor Market Policies (ALMP) are not taken into account. The average number of beneficiaries from ALMPs, greater than over 2.2 millions in 2016 and 2017, shrank to 1.6 in 2018 and even more in 2019 coming to affect slightly more than 1 million of workers (see Tables 12 and 13 in Appendix). However, the average number of beneficiaries workers in the age class 15-29 suffered less from this reduction while their share increased: 0.78 million of young workers in 2016, equal to 35.5% of total beneficiaries, 0.86 in 2017 (39.2%), 0.78 in 2018 (47.7%), and 0.76 in 2019 (72.8%). Henceforth, despite the average number of young beneficiaries from ALMPs did not increase in 2018 and 2019—compared to 2016 and 2017—, it is not possible to allegedly assume results were not positively affected by them. In order to overcome these problems, one possible extension of this analysis would be to conduct a complete different approach by comparing young workers with fixed-term contracts close to (expected) expiration before and after July 14 of 2018 with a Regression Discontinuity Design (RDD) (Imbens and Lemieux, 2008).

Eventually, another possible development of the proposed analysis would be to extend it to the whole stock of workers in Italy. However, this investigation would require a different source of data from the National Institute for Social Security (INPS). Nonetheless, this different source would allow to investigate the effect of the DD even from the firms' side, for example, in the use of turnovers instead of stabilization.

4.1 Robustness analysis

To further validate the obtained results, a set of robustness checks have been performed whose results are reported in Appendix. The first analysis is conducted only on workers within the age group 15-24. In fact, in the attempt to identify the stock of young workers from CO data, when considering the age group 15-29, there is a chance to not effectively capture all contracts from the history of (relatively) older workers. For example, a 29-year-old worker in 2018 would have been 20 years in 2009, when the CO system fully entered into force. Therefore, any possible open-end contract occurred before this year and without future changes until now would not be accounted for leading to possibly (wrongly) identify the worker as unemployed over specific time horizons. Although the possibility is relatively low, by considering

youngest age group 15-24 this possibility is completely avoided (a 24-year-old worker in 2018 would have been exactly 15 in 2009).²³

Results, reported on Table 5 in Appendix, are similar to what previously obtained although the effect on the probability of being employed is far less significant suggesting how the DD did not impacted on work persistence for the age group 15-24. Conversely, by looking at the probability of being employed with an open-end contract, results are always significant with marginal effects in line with what obtained on Table 1 with a probability of 2.4% after one year and 2.2% after one year and six months.

The second robustness analysis discharged from the group of young workers under investigation those that experienced mostly a career as public employee. Because the public sector could be characterized by greater stabilization, to seek whether or not the presence of workers embarked on public careers could affect the result, those that spent 50% or more of their contractual days before July 14 as public employee have been eliminated from the sample used in the main analysis. The identification was based on the relative national collective bargain agreement (*i.e.*, *Contratti Collettivi Nazionali di Lavoro – C.c.n.l.*)²⁴ as public employee associated to each hiring.²⁵

Results regarding the probability of being employed follows those from the main analysis with a general lack of statistical significance. Conversely, the probability of being employed with a permanent contract is higher for those workers with 2.7% after one year and 2.6% after one year and half. The justification for this result is due to the fact that those young workers, excluded from the analysis, are most exclusively employed with fixed-term contracts as primary and secondary school teachers and their path through stabilization could be remarkably long. The greatest

²³By performing this sub-setting, the whole analyzed sample shrank to 43,981 units (14,905 treated and 29,076 control) and the same matching procedure used for the main analysis has been implemented—although here the *logit* link function has been preferred, instead. The matched sample was composed by 29,810 units equally divided between the two groups. Balancing outcomes of the PSM are reported in Appendix (Figures 14 and 15).

²⁴The specific C.c.n.l. considered was the following: *per il personale delle Amministrazioni statali comprese quelle ad ordinamento autonomo, per il personale degli Enti Pubblici, delle Istituzioni pubbliche di assistenza e beneficenza, delle Istituzioni pubbliche sanitarie, delle Aziende autonome di turismo, cura e soggiorno del Parastato*, active until January 14, 2020, and subsequently replaced by the contracts *Pubblica Amministrazione* and *Personale del comparto Regioni ed Enti locali*. It should be noted that these classifications are two generic clusters which include a wide number of public collective bargain agreements (Cnel, 2023).

²⁵By performing this sub-setting, the whole analyzed sample shrank to 58,365 units (20,066 treated and 38,569 control) and the same matching procedure used for the main analysis has been implemented. The matched sample was composed by 40,132 units equally divided between the two groups. Balancing outcomes of the PSM are reported in Appendix (Figures 16 and 17).

work stability within the public sector is furthermore associated to more experienced (in terms of worked years) employee retracing the high generational segmentation which characterize the Italian labor market. Results are reported on Table 6 in Appendix.

The third robustness analysis considered only workers in the control group by dividing them according to the year in which they entered in the labor market identifying as treated those entered in 2017. In fact, by extending the analysis up to two years after July 14 of 2017, the reference period would effectively falls—for the treated workers in 2017—within the period in which the DD began to take effect. Accordingly, results which refer to 90 days up to one year and half would not be affected by the reform while only the outcome referred to two years would be.²⁶

Results, reported on Table 7, show a positive impact from 90 days up to 1 year and half of the probability of being employed. Therefore, it means that generally young workers entered in the market in 2017 had higher probabilities in being still employed in the labor market, regardless of the reform. However, the probability after two years—therefore, in a period in which the DD reform has effectively entered into force—becomes statistically not significant (and with a low marginal effect), hence in line to what previously obtained: the general lack in effectiveness for the DD reform, in boosting the persistence in the labor market for young workers. Conversely, results for the probability of being employed through an open-end contract show a negative signs between 90 days up to 1 year, suggesting how young workers entered in the market in 2016 initially had better chances in stabilizing, probably still due to incentives provided by the stability law for 2016 (L. 208/2015). Nonetheless, after one year and half the marginal effects sign switch to positive. In fact, by considering this time frame treated workers are effectively in a phase where the DD already entered into force. Moreover, when considering two years results are positive and statistically significant with a marginal effect in line with what obtained on Table 1.

For the last robustness analysis the PSM has been also associated with a Difference in differences (DiD) regression (Abadie, 2005). The model adopted follows the standard two-periods (pre- and post-) specification (Bertrand et al., 2004) through the following equation (3):

$$\Delta Employed_i = \alpha + \beta_1 DD_i + \beta_2 Post + \beta_3 (Post_i \cdot DD_i) + \varepsilon_i \quad (3)$$

²⁶Because the treated group (22,574) was greater than the control group (17,022), the PSM procedure adopted allowed for replacement up to a maximum of three to avoid a higher loss in precision while the preferred link function was the *logit* regression. Results were optimal even for this group of workers with no treated units discarded and the relative balancing results are reported on Figures 18 and 19. Eventually, the matched sample was composed by 45148 units with 22,574 treated and 11,271 used to have an equivalent number of controls.

where $\Delta Employed_i$ represents the difference in the population of employed workers before and after July 14 while the interaction between $Post_i$ and DD_i represents the effect of the policy over the treated group or rather the ATT. Results, reported on Table 8 are similar to what obtained on Table 1 and confirm the absence on an effective positive impact of the reform in the probability of being employed except for a slight significant positive impact after 90 days. Conversely, when focusing on the probability of being employed with an open-end contract, the impact is statistically significant and positive with a marginal effect equal to 1.4% after one year and 1.5% after one year and half. Therefore, albeit in line with the outcome of the basic model, the positive impact is reduced.

The application of DiD after PSM has been performed even for the three group of workers identified in the previous robustness analyses: (i) age group 15-24; (ii) exclusion of public employees; (iii) workers entered in the labor market in 2017 as treated units. In the first case results (Table 9) were in line with those of the primary model (Tables 1 and 5), even in this case with a slight reduction in the effect of the reform on the probability of being employed with an open-end contract after one year and one year and half. Also results from the second case are in line with what previously obtained. While the probability of being employed shows non statistical significance (Table 10), when considering the goal of an open-end contract, the interaction term is statistically significant showing, after one year and one year and half, an higher marginal effect compared to the baseline scenario. In the third case, results (Table 11) regarding the probability of being employed follows those already obtained only with the PSM (Table 7) stressing further the absence of an effective impact when considering the time spans of one year and half and two years, where the impact of DD would occur. Regarding the probability of being employed with open-end contracts, instead, the interaction term (ATT) shows a negative impact for results between 90 days and 1 year but they become positive after 1 year and half and 2 years, with increasing coefficients.

V Conclusions

Since the early nineties, the Italian labor market has embarked a profound path of reforms aimed at aligning it the European labor market. During the past decades the Italian labor market has been profoundly reshaped with the primary goal to line with the European framework of *flexicurity*. Therefore, the reforms adopted by the government introduced higher level of deregulation within the labor market together with new form of atypical temporary contracts. However, the beneficial effects of these policies are all but clear, especially within a labor market highly segmented.

In 2018, one of the first interventions of the M5S-Lega coalition government was the reform of the labor market with heavy opposition to the previous Job Act. Therefore, after years of legislative interventions aimed at flexibilise the national labor market, the so-called Dignity Decree introduced strong limitations to the use of temporary contracts with the goal to fight precariousness.

The aim of this work was to evaluate the impact of DD on the career paths of young workers (age class 15-29) recently entered in the labor market. Specifically, on their probability of being employed after specific time frame, from 90 days up to 1 year and more from the implementation of DD as well as the probability of reaching an open-ended contract within the same time horizons. The the best of our knowledge there are no empirical studies which investigates the effect of the DD reform over workers' stability. The analysis relies on an exclusive sample of Compulsory Communications (CO) data which also includes contracts pledges by temporary work agency. Through a Propensity Score Matching (PSM) estimation we were able to evaluate the effect of the DD over the working paths of young workers. Results show a poor effect of the reform in boosting the persistence in the labor market, hence the probability of being employed after one year and more since the entry into force of the reform. Nonetheless, an effective positive impact emerged while focusing on the probability of being employed with an open-ended contract, which increased, for example, by 2.7% after one year.

Although the reform does not seem to have boosted young worker's persistence within the labor market, by introducing limitations to the use of fixed-term contracts, it increased the achievement of an open-end contract, at least over relative short-time horizons. In fact, the subsequent overspread of the pandemic crisis less than two years after the implementation fo the DD undoubtedly represented an temporal limit of the analysis.

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Appendix A Sample characteristics

The main source of analysis for CO research purposes is the CICO database (integrated sample of mandatory communications) provided by the Italian Ministry of Labor and Social Policies (MLPS). However, the CO sample used for this analysis differs from CICO under manifold characteristics.

Different sample size and sampling approach

In the release relative to the second quarter of 2022, the number of observations in CICO was approximately 20 million. Differently, the specific CO sample used in this article was approximately 24 million. Furthermore, to these entries are added also data related to temporary work agencies (*i.e.*, *missioni* and *somministrazioni*), not included in CICO, reaching a total sample of over 27 million observations, able to account for the entire Italian labor demand from private and public employers. Therefore, the sample used is 23.5% larger than CICO.

The sampling is carried out solely on the basis of the individual tax code and not on the date of birth leading to a significantly lower margin of error when reporting to the entire population (-0.47% against 2.95% based on the period first quarter 2018 - second quarter of 2022). Moreover, the sampling procedure refers to a larger share of the entire population (16.6% against 13.2%) involving more than 4.5 million of different workers (3.9 million with CICO).

Presence of additional information

Additional variables such as those on extensions or contracts' expected end dates.

Greater dis-aggregation of variables such as territorial ones or those referring to professional codes (CP2011). The former at municipal level while the latter at 6 digit level (in both cases the maximum level of dis-aggregation allowable); conversely, with CICO they stop, instead, at regional and 4 digit level, respectively.

However, compared to CICO data, the Inps integration concerning wages is missing. Nonetheless, this variable covers only around 63% of all entries in CICO.²⁷

²⁷Alongside the CICO database the MLPS provides also another source, named LoSai, which represents a sample referred to autonomous workers. Nonetheless, the sampling strategies between CICO and LoSai is different. Therefore, they include different individuals resulting in the impossibility to follow workers which moves from dependent to autonomous works and *vice versa*.

Unlocked registry details

Data referred to nationality, domiciliary residence and academic degree are locked to the latest available occurrence in CICO. Conversely, in our sample these data are unlocked, allowing to follow academic evolution, domiciliary movements, and overcome possible imputation errors.

Appendix B Additional tables and figures

Figure 8: *Absolute standardized mean difference for covariates*

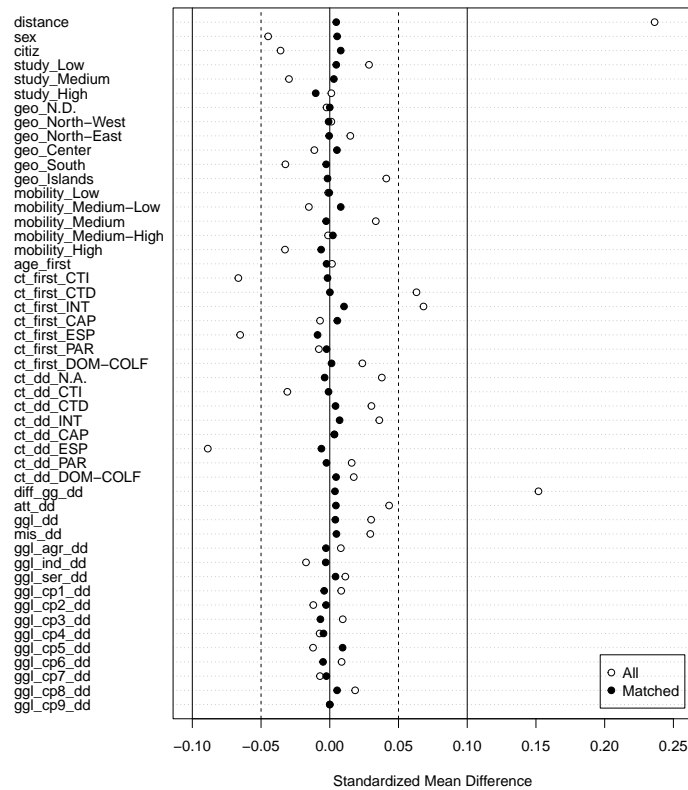


Figure 9: *Balancing graph before and after the PSM*

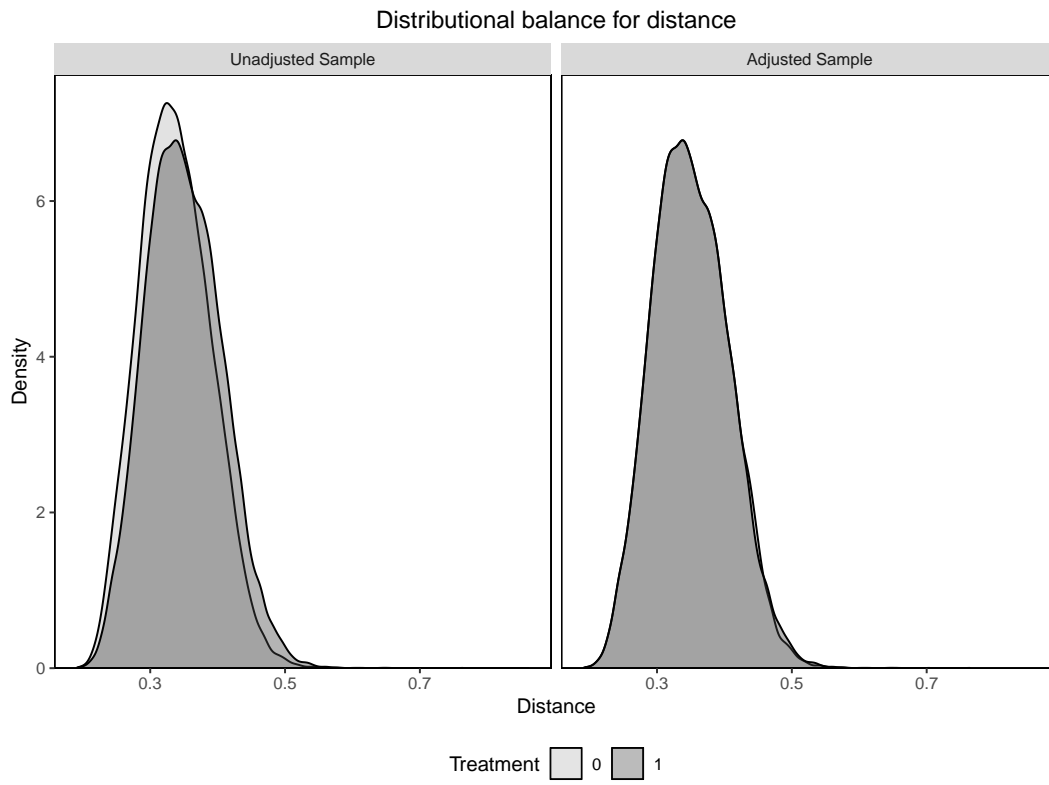


Figure 10: *Absolute standardized mean difference for covariates (without considering workers with an active open-end contract on July 14)*

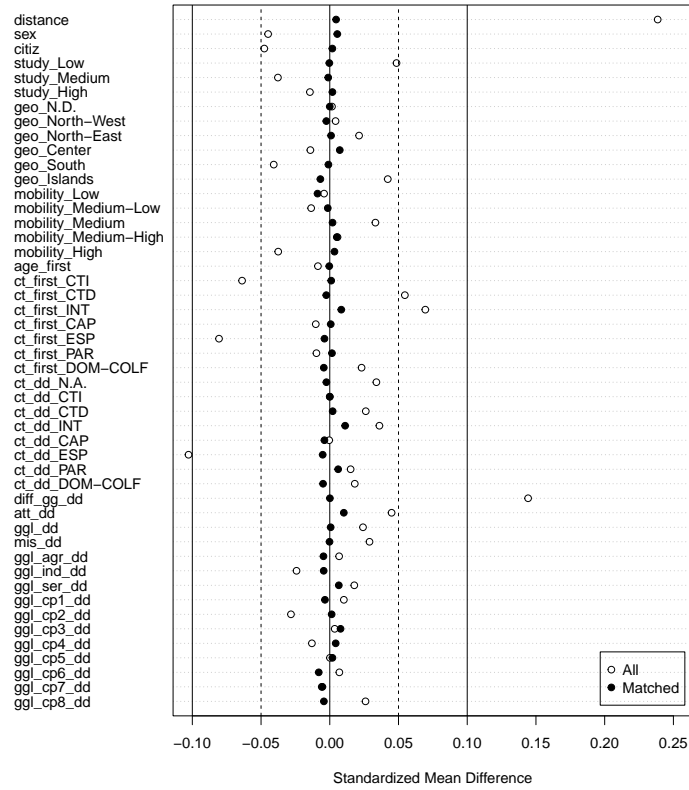


Figure 11: *Balancing graph before and after the PSM (without considering workers with an active open-end contract on July 14)*

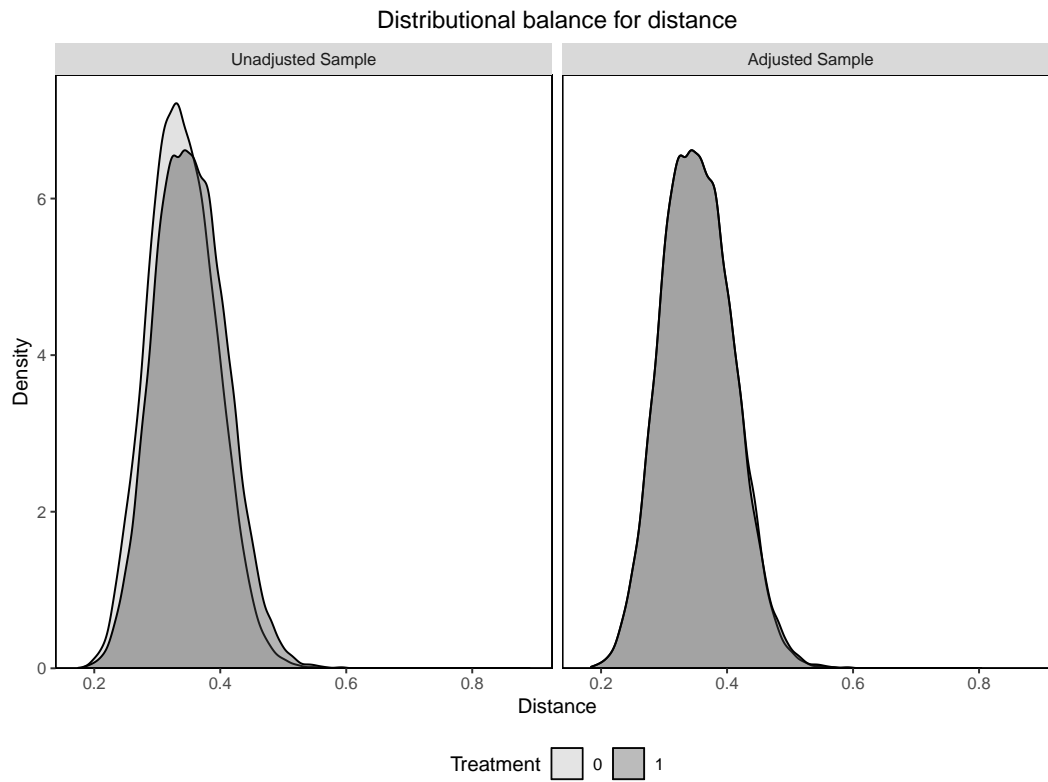


Figure 12: *Absolute standardized mean difference for covariates (only workers who have passed through temporary agency work)*

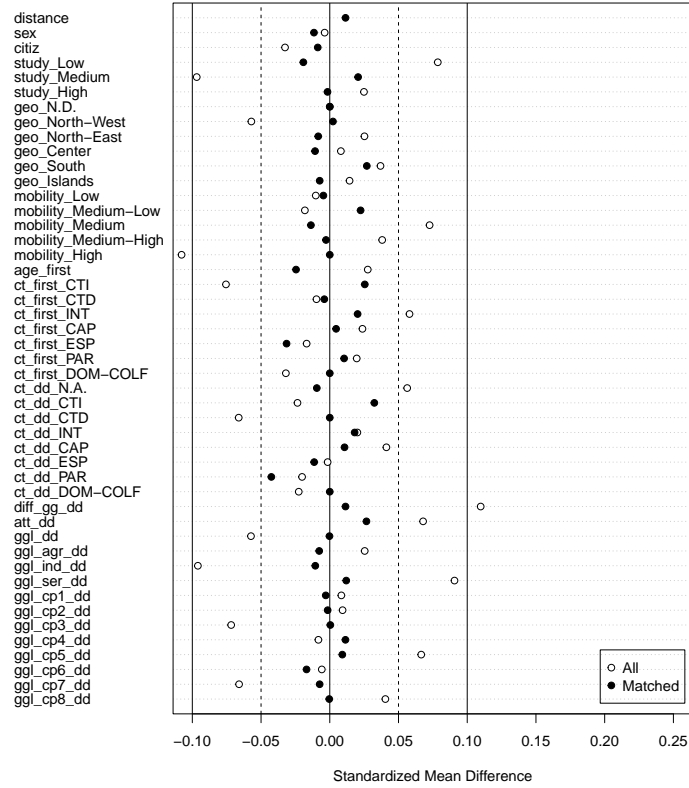


Figure 13: *Balancing graph before and after the PSM (only workers who have passed through temporary agency work)*

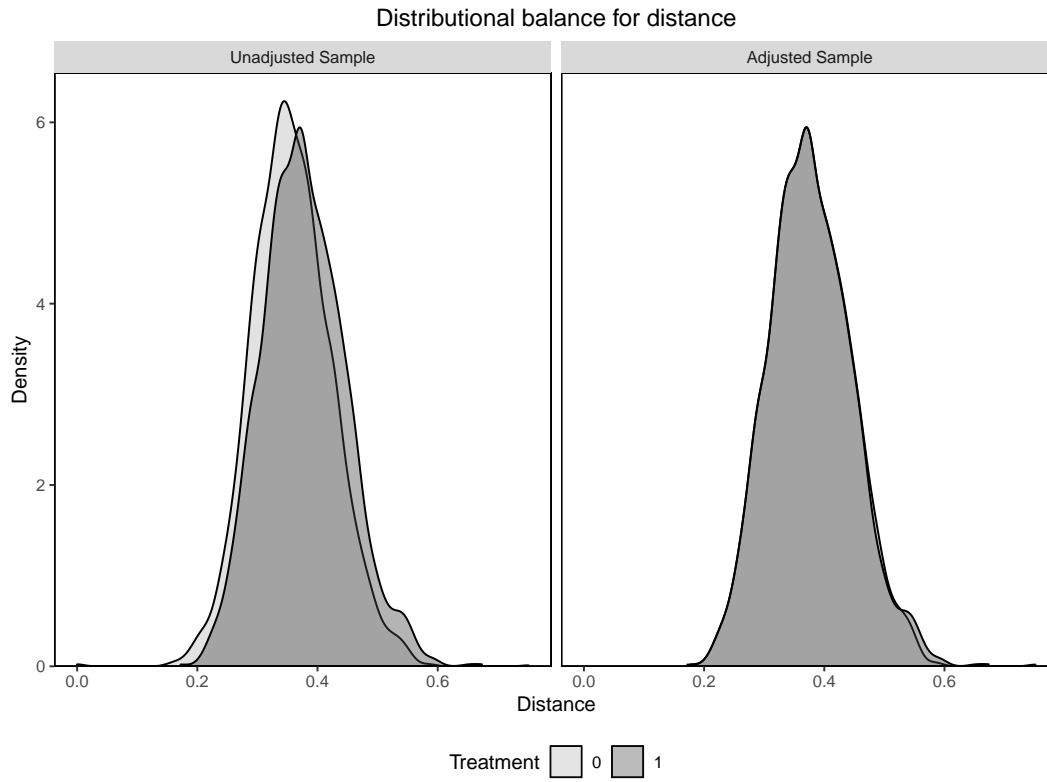


Figure 14: *Absolute standardized mean difference for covariates (age group 15-24)*

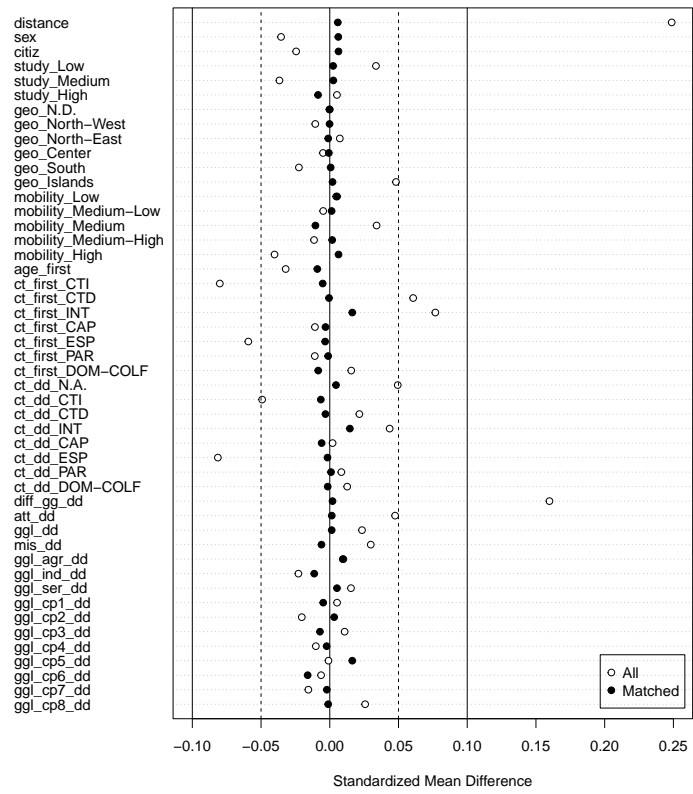


Figure 15: *Balancing graph before and after the PSM (age group 15-24)*

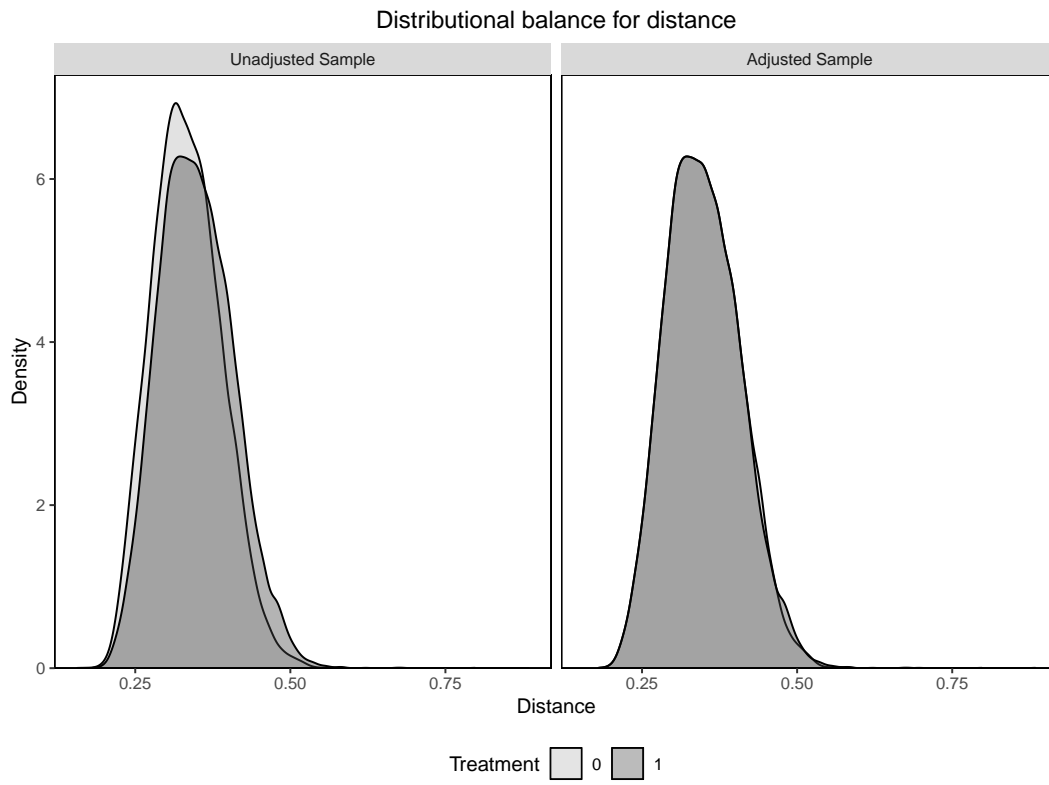


Figure 16: *Absolute standardized mean difference for covariates (without public employees)*

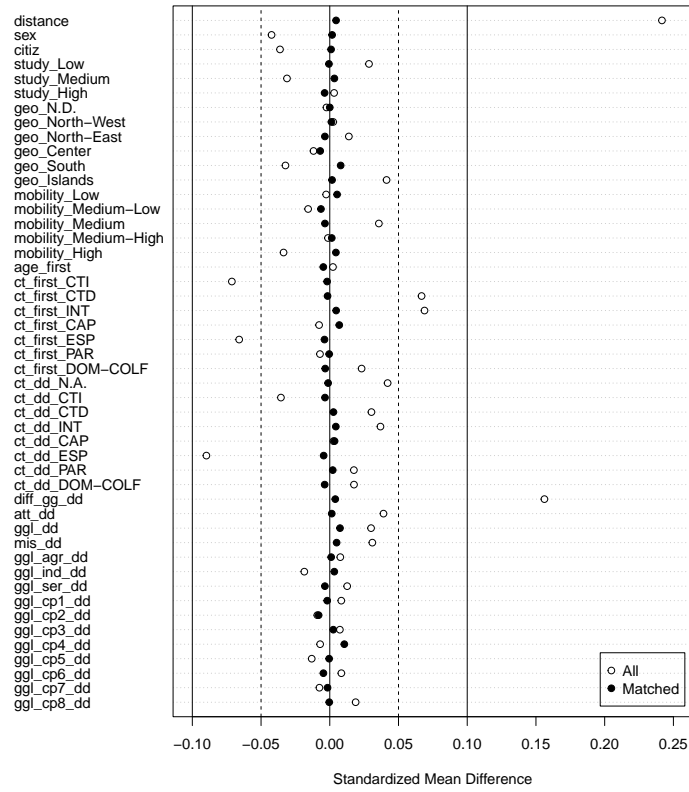


Figure 17: *Balancing graph before and after the PSM (without public employees)*

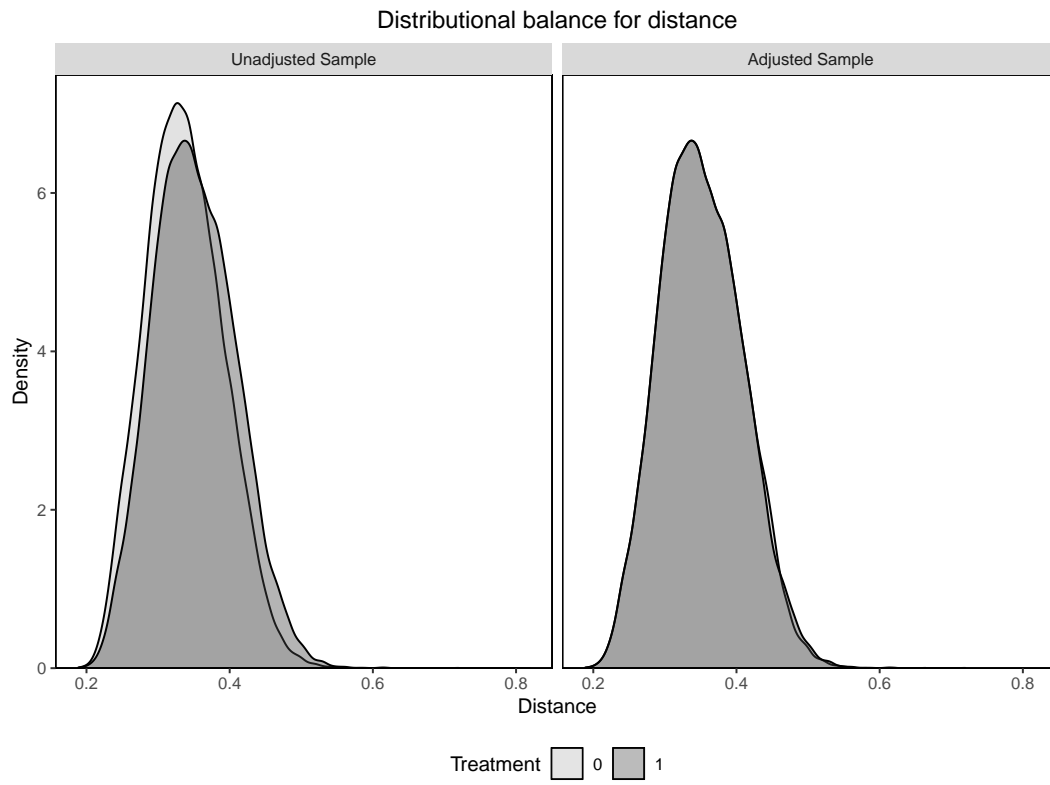


Figure 18: *Absolute standardized mean difference for covariates (2017 as treated)*

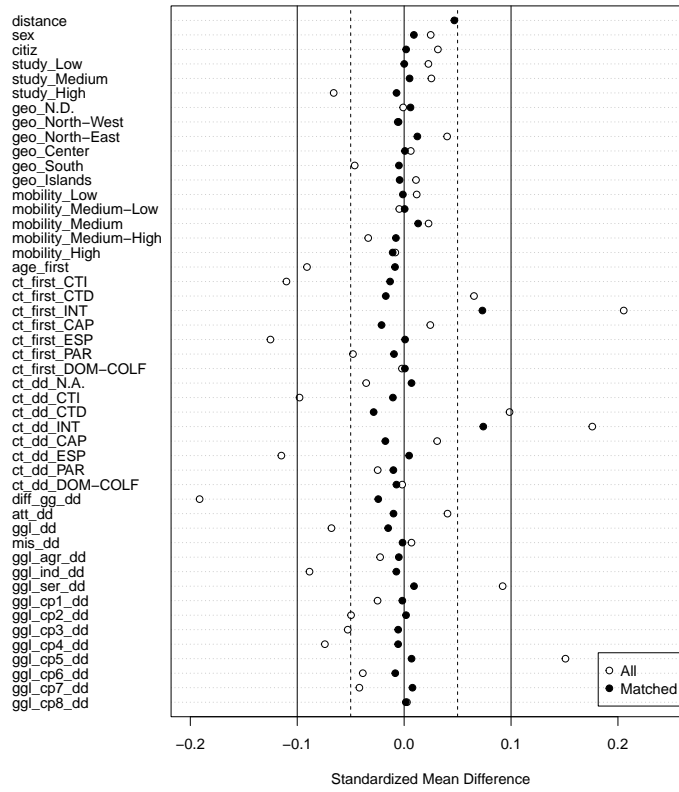


Figure 19: *Balancing graph before and after the PSM (2017 as treated)*

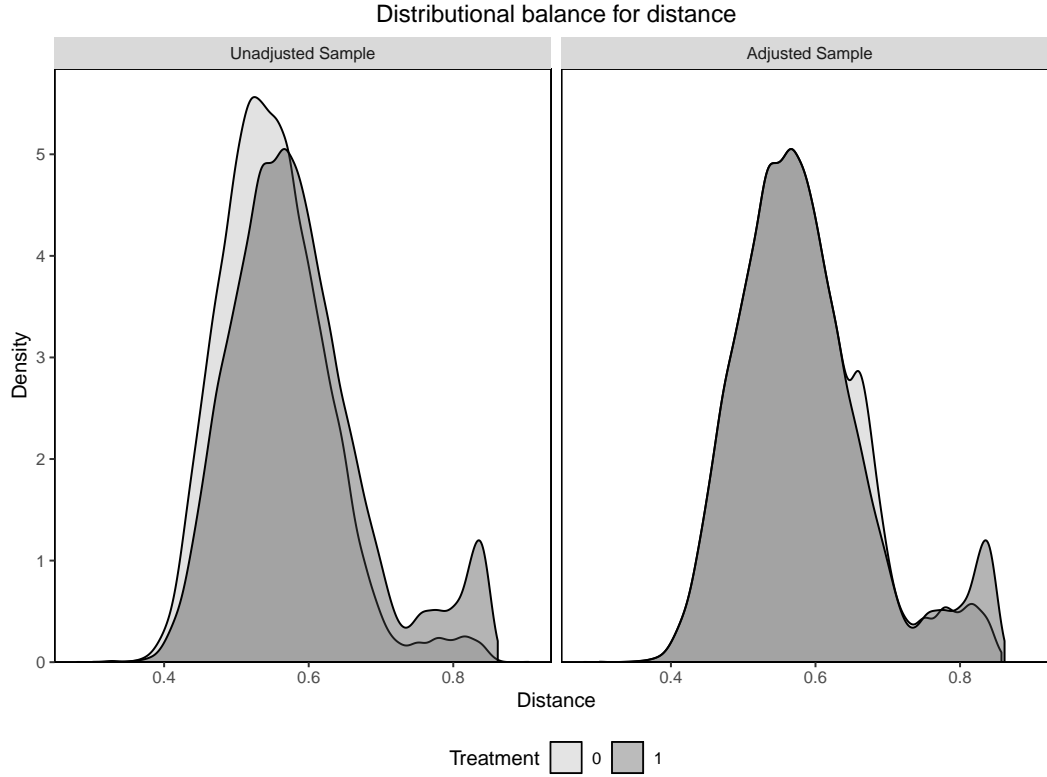


Table 4: *Effect of DD on the number of signed contracts and working days after 90 days up to 2 years later*

Number of signed contracts															
	90 days			180 days			1 year		1 year and 6 months		2 years				
	<i>Estimate</i>	<i>S.E.</i>		<i>Estimate</i>	<i>S.E.</i>		<i>Estimate</i>	<i>S.E.</i>	<i>Estimate</i>	<i>S.E.</i>	<i>Estimate</i>	<i>S.E.</i>			
DD	-0.0302	0.0077	***	-0.0839	0.0133	***	-0.1356	0.0248	***	-0.1577	0.0326	***	-0.3240	0.0389	***
R ²	0.2092			0.2358			0.2202			0.2003			0.1776		
Adj. R ²	0.2084			0.2350			0.2193			0.1995			0.1767		

Number of working days														
	90 days			180 days			1 year		1 year and 6 months		2 years			
	<i>Estimate</i>	<i>S.E.</i>		<i>Estimate</i>	<i>S.E.</i>		<i>Estimate</i>	<i>S.E.</i>	<i>Estimate</i>	<i>S.E.</i>	<i>Estimate</i>	<i>S.E.</i>		
DD	0.7500	0.2063	***	1.7551	0.4841	***	2.2306	1.0653	*	3.3946	1.6228	*	-0.4918	2.2071
R ²	0.7015			0.5625			0.4446			0.3920			0.3540	
Adj. R ²	0.7012			0.5621			0.4441			0.3914			0.3533	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects are in *italics*.

Table 5: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (age class 15-24)*

Employed												
	90 days		180 days		1 year		1 year and 6 months		2 years			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>		
ATT (1)	0.0272	0.0146	0.0073	0.0144	-0.0160	0.0146	-0.0096	0.0145	-0.1069	0.0146	***	
	<i>0.0107</i>	<i>0.0057</i>	<i>0.0029</i>	<i>0.0057</i>	<i>-0.0062</i>	<i>0.0057</i>	<i>-0.0038</i>	<i>0.0057</i>	<i>-0.0421</i>	<i>0.0057</i>		
ATT (2)	0.0452	0.0168	**	0.0170	0.0159	-0.0140	0.0157	-0.0043	0.0153	-0.1147	0.0153	***
	<i>0.0124</i>	<i>0.0046</i>		<i>0.0053</i>	<i>0.0050</i>	<i>-0.0046</i>	<i>0.0051</i>	<i>-0.0015</i>	<i>0.0053</i>	<i>-0.0402</i>	<i>0.0053</i>	

Employed with an open-ended contract															
	90 days		180 days		1 year		1 year and 6 months		2 years						
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>					
ATT (1)	0.0197	0.0185	0.0569	0.0181	**	0.0980	0.0173	***	0.0785	0.0168	***	0.0494	0.0164	**	
	<i>0.0040</i>	<i>0.0037</i>	<i>0.0122</i>	<i>0.0039</i>		<i>0.0238</i>	<i>0.0042</i>		<i>0.0210</i>	<i>0.0045</i>		<i>0.0141</i>	<i>0.0047</i>		
ATT (2)	0.0729	0.0278	**	0.1098	0.0232	***	0.1347	0.0200	***	0.1023	0.0185	***	0.0651	0.0177	***
	<i>0.0058</i>	<i>0.0024</i>		<i>0.0136</i>	<i>0.0028</i>		<i>0.0242</i>	<i>0.0034</i>		<i>0.0224</i>	<i>0.0041</i>		<i>0.0158</i>	<i>0.0043</i>	

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 29,810. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Table 6: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (without public employees)*

Employed												
	90 days		180 days		1 year		1 year and 6 months		2 years			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>		
ATT (1)	0.0394	0.0126	**	0.0199	0.0125	0.0094	0.0126	0.0156	0.0125	-0.0835	0.0125	***
	<i>0.0153</i>	<i>0.0049</i>		<i>0.0079</i>	<i>0.0049</i>	<i>0.0036</i>	<i>0.0049</i>	<i>0.0062</i>	<i>0.0050</i>	<i>-0.0328</i>	<i>0.0049</i>	
ATT (2)	0.0533	0.0146	***	0.0239	0.0137	0.0096	0.0135	0.0184	0.0133	-0.0941	0.0132	***
	<i>0.0142</i>	<i>0.0039</i>		<i>0.0074</i>	<i>0.0042</i>	<i>0.0031</i>	<i>0.0044</i>	<i>0.0063</i>	<i>0.0046</i>	<i>-0.0327</i>	<i>0.0046</i>	

Employed with an open-ended contract															
	90 days		180 days		1 year		1 year and 6 months		2 years						
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>					
ATT (1)	0.0211	0.0155	0.0583	0.0152	***	0.1078	0.0147	***	0.0926	0.0142	***	0.0530	0.0139	***	
	<i>0.0046</i>	<i>0.0034</i>	<i>0.0137</i>	<i>0.0036</i>		<i>0.0281</i>	<i>0.0038</i>		<i>0.0263</i>	<i>0.0040</i>		<i>0.0160</i>	<i>0.0042</i>		
ATT (2)	0.0605	0.0232	**	0.1019	0.0193	***	0.1413	0.0169	***	0.1134	0.0156	***	0.0611	0.0149	***
	<i>0.0052</i>	<i>0.0021</i>		<i>0.0137</i>	<i>0.0025</i>		<i>0.0269</i>	<i>0.0032</i>		<i>0.0261</i>	<i>0.0036</i>		<i>0.0157</i>	<i>0.0038</i>	

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 40,132. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Table 7: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (2017 as treated)*

Employed														
	90 days			180 days			1 year		1 year and 6 months		2 years			
	<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>		
ATT (1)	0.0724	0.0118	***	0.0800	0.0118	***	0.0280	0.0119	*	0.0276	0.0118	*	-0.0005	0.0119
	<i>0.0281</i>	<i>0.0046</i>		<i>0.0316</i>	<i>0.0047</i>		<i>0.0109</i>	<i>0.0046</i>		<i>0.0109</i>	<i>0.0047</i>		<i>-0.0002</i>	<i>0.0046</i>
ATT (2)	0.1050	0.0137	***	0.1108	0.0130	***	0.0406	0.0128	**	0.0429	0.0124	***	0.0081	0.0125
	<i>0.0288</i>	<i>0.0038</i>		<i>0.0347</i>	<i>0.0041</i>		<i>0.0133</i>	<i>0.0042</i>		<i>0.0148</i>	<i>0.0043</i>		<i>0.0028</i>	<i>0.0043</i>

Employed with an open-ended contrat															
	90 days			180 days			1 year		1 year and 6 months		2 years				
	<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>			
ATT (1)	-0.0209	0.0144		-0.0826	0.0143	***	-0.0442	0.0138	**	0.0425	0.0134	**	0.0700	0.0131	***
	<i>-0.0045</i>	<i>0.0031</i>		<i>-0.0187</i>	<i>0.0032</i>		<i>-0.0110</i>	<i>0.0034</i>		<i>0.0116</i>	<i>0.0037</i>		<i>0.0206</i>	<i>0.0039</i>	
ATT (2)	-0.0337	0.0219		-0.1324	0.0183	***	-0.0425	0.0159	**	0.0712	0.0148	***	0.0977	0.0142	***
	<i>-0.0028</i>	<i>0.0030</i>		<i>-0.0171</i>	<i>0.0012</i>		<i>-0.0077</i>	<i>0.0029</i>		<i>0.0157</i>	<i>0.0032</i>		<i>0.0244</i>	<i>0.0035</i>	

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 29,810. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Table 8: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (DiD)*

Employed															
	90 days			180 days			1 year		1 year and 6 months		2 years				
	<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>			
ATT (1)	0.0641	0.0293	*	0.0353	0.0355		0.0107	0.0355		0.0343	0.0355		-0.1243	0.0355	***
	<i>0.0205</i>			<i>0.0079</i>			<i>0.0023</i>			<i>0.0077</i>			<i>-0.0276</i>		
ATT (2)	0.1397	0.0390	***	0.0452	0.0359		0.0051	0.0365		0.0334	0.0336		-0.2165	0.0348	***
	<i>0.0092</i>			<i>0.0045</i>			<i>0.0005</i>			<i>0.0061</i>			<i>-0.0256</i>		

Employed with an open-ended contrat															
	90 days			180 days			1 year		1 year and 6 months		2 years				
	<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>		<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>			
ATT (1)	0.0336	0.0409		0.0927	0.0402	*	0.1693	0.0391	***	0.1497	0.0382	***	0.0873	0.0376	*
	<i>0.0022</i>			<i>0.0069</i>			<i>0.0155</i>			<i>0.0163</i>			<i>0.0109</i>		
ATT (2)	0.1822	0.0883	*	0.2954	0.0654	***	0.3670	0.0511	***	0.2726	0.0444	***	0.1508	0.0409	***
	<i>0.0004</i>			<i>0.0028</i>			<i>0.0101</i>			<i>0.0126</i>			<i>0.0092</i>		

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 41,138. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Table 9: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (DiD, age class 15-24)*

Employed												
	90 days		180 days		1 year		1 year and 6 months		2 years			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>		
ATT (1)	0.0569	0.0339	0.0520	0.0430	0.0224	0.0433	0.0432	0.0432	-0.1400	0.0433	**	
	<i>0.0188</i>		<i>0.0114</i>		<i>0.0047</i>		<i>0.0095</i>		<i>-0.0299</i>			
ATT (2)	0.1307	0.0447	**	0.0479	0.0410	-0.0089	0.0432	0.0277	0.0392	-0.2736	0.0412	***
	<i>0.0090</i>		<i>0.0049</i>		<i>-0.0008</i>		<i>0.0051</i>		<i>-0.0328</i>			

Employed with an open-ended contrat															
	90 days		180 days		1 year		1 year and 6 months		2 years						
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>					
ATT (1)	0.0564	0.0504	0.1240	0.0497	*	0.2094	0.0481	***	0.1782	0.0470	***	0.1091	0.0462	*	
	<i>0.0028</i>		<i>0.0070</i>			<i>0.0152</i>			<i>0.0158</i>			<i>0.0112</i>			
ATT (2)	0.2738	0.1069	*	0.3682	0.0807	***	0.4325	0.0622	***	0.3053	0.0541	***	0.1690	0.0498	***
	<i>0.0007</i>		<i>0.0033</i>		<i>0.0105</i>		<i>0.0124</i>		<i>0.0124</i>			<i>0.0091</i>			

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 29,810. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Table 10: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (DiD, without public employees)*

Employed												
	90 days		180 days		1 year		1 year and 6 months		2 years			
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>		
ATT (1)	0.0607	0.0297	*	0.0423	0.0357	0.0255	0.0358	0.0354	0.0357	-0.1253	0.0358	***
	<i>0.0191</i>			<i>0.0095</i>		<i>0.0055</i>		<i>0.0080</i>		<i>-0.0274</i>		
ATT (2)	0.1366	0.0388	***	0.0594	0.0354	0.0287	0.0367	0.0361	0.0342	-0.2144	0.0349	***
	<i>0.0089</i>			<i>0.0059</i>		<i>0.0027</i>		<i>0.0064</i>		<i>-0.0256</i>		

Employed with an open-ended contrat															
	90 days		180 days		1 year		1 year and 6 months		2 years						
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>					
ATT (1)	0.0496	0.0412	0.1169	0.0405	**	0.2025	0.0395	***	0.1719	0.0386	***	0.1014	0.0380	**	
	<i>0.0033</i>		<i>0.0088</i>			<i>0.0187</i>			<i>0.0188</i>			<i>0.0127</i>			
ATT (2)	0.2613	0.0900	**	0.3673	0.0668	***	0.4376	0.0520	***	0.3113	0.0452	***	0.1704	0.0416	***
	<i>0.0007</i>		<i>0.0036</i>		<i>0.0122</i>		<i>0.0142</i>		<i>0.0142</i>			<i>0.0104</i>			

Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 40,132. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

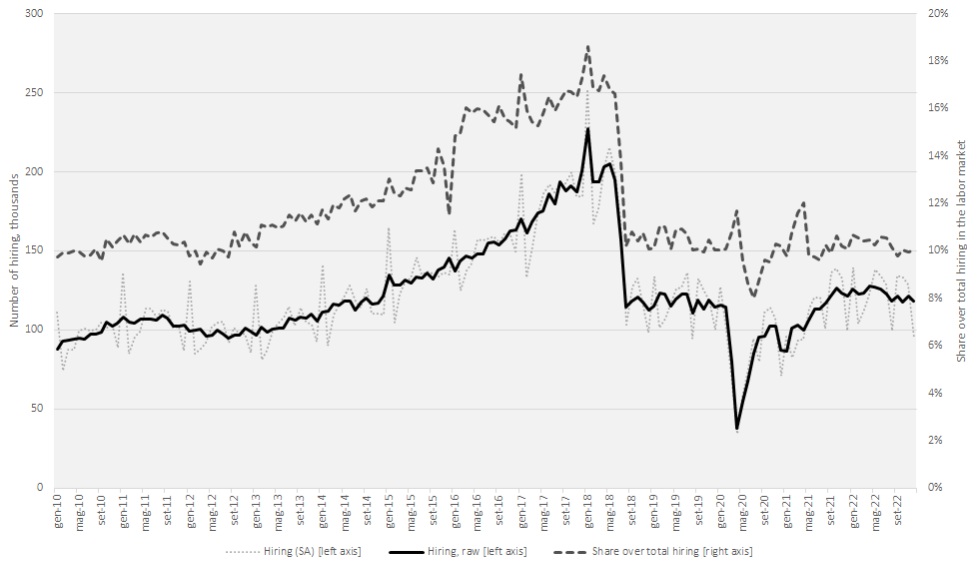
Table 11: *Effect of DD on the probability of being employed and employed with an open-end contract after 90 days up to 2 years later (DiD, 2017 as treated)*

Employed											
	90 days		180 days		1 year		1 year and 6 months		2 years		
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	
ATT (1)	0.1322	0.0283 ***	0.1599	0.0333 ***	0.0770	0.0334 *	0.0762	0.0333 *	0.0313	0.0334	
	<i>0.0402</i>		<i>0.0357</i>		<i>0.0165</i>		<i>0.0170</i>		<i>0.0067</i>		
ATT (2)	0.2641	0.0355 ***	0.2522	0.0329 ***	0.1020	0.0342 **	0.0835	0.0321 **	0.0214	0.0331	
	<i>0.0196</i>		<i>0.0267</i>		<i>0.0101</i>		<i>0.0151</i>		<i>0.0025</i>		

Employed with an open-ended contract											
	90 days		180 days		1 year		1 year and 6 months		2 years		
	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	<i>Coeff.</i>	<i>S.E.</i>	
ATT (1)	-0.0070	0.0384	-0.1201	0.0380 **	-0.0476	0.0371	0.1068	0.0362 **	0.1530	0.0356 ***	
	<i>-0.0004</i>		<i>-0.0083</i>		<i>-0.0039</i>		<i>0.0105</i>		<i>0.0177</i>		
ATT (2)	-0.0387	0.0862	-0.3804	0.0647 ***	-0.1068	0.0503 *	0.1877	0.0436 ***	0.2421	0.0398 ***	
	<i>-0.0001</i>		<i>-0.0033</i>		<i>-0.0024</i>		<i>0.0074</i>				

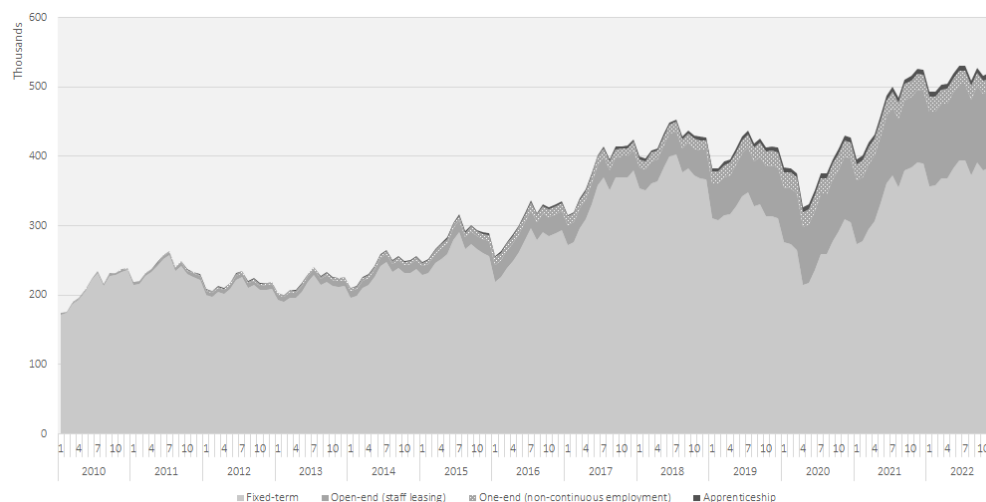
Notes: (1) regression without covariates adjustment; (2) regression with covariates adjustment; number of observations 45,148. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. Cluster-robust standard errors with pair membership as the clustering variable. Marginal effects (risk-difference) are in *italics*.

Figure 20: *Hiring through temporary agency work (2010–2022, monthly)*



Note: TRAMO-SEATS procedure for seasonally adjustment through JDemetra+ (version 2.2.4). Source: Author's elaboration based on CO data.

Figure 21: *Employed workers through temporary agency work by contract type (2010–2022, monthly)*



Source: Author's elaboration based on CO data.

Table 12: *Active Labor Market Policies, average number of beneficiaries by intervention category (2015–2019)*

	2015	2016	2017	2018	2019
Mixed cause contracts	411,513	381,616	426,974	492,327	562,416
Incentives: Open-end	933,727	1,679,776	1,648,271	1,022,920	363,003
Incentives: Fixed-term	59,166	52,490	53,508	51,976	45,531
Incentives: Job stabilization	84,087	90,571	82,505	68,157	72,737
Incentives: Existing jobs preservation	14	13	12	13	9
Integration of disabled people	161	935	3,378	4,221	3,445
Total	1,488,668	2,205,401	2,214,648	1,639,614	1,047,141
<i>of which young workers (15-29)</i>	679,234	783,484	867,673	782,449	761,930
<i>Share over total</i>	45.6%	35.5%	39.2%	47.7%	72.8%

Source: Author's elaboration based on (Inps, 2022a).

Table 13: *Active Labor Market Policies, average number of beneficiaries by intervention category with relative young workers share (15-29) (2015-2019)*

Intervention type	2015		2016		2017		2018		2019	
	<i>Avg.</i>	<i>% young</i>	<i>Avg.</i>	<i>% young</i>	<i>Avg.</i>	<i>% young</i>	<i>Avg.</i>	<i>% young</i>	<i>Avg.</i>	<i>% young</i>
Apprendistato	410,724	88.3%	381,206	85.0%	426,971	90.5%	492,327	90.0%	562,416	88.6%
Assunzioni agevolate di beneficiari di CIGS da almeno 3 mesi	130	3.8%	6,588	4.1%	53	0.0%	39	7.7%	153	2.0%
Assunzioni agevolate di disabili									3,445	15.6%
Assunzioni agevolate di disoccupati o beneficiari di CIGS da almeno 24 mesi, o di giovani già impegnati in borse di lavoro	219,245	27.7%	113,540	24.6%	38,133	21.1%				
Assunzioni agevolate di lavoratori iscritti nelle liste di mobilità (tempo determinato)	33,238	3.5%	23,898	2.5%						
Assunzioni agevolate di lavoratori iscritti nelle liste di mobilità (tempo indeterminato)	9,031	5.9%	6,588	4.1%						
Assunzioni agevolate di ultracinquantenni e di donne	14,758	16.8%	12,009	20.9%	30,047	17.3%	50,814	15.4%	57,267	14.4%
Assunzioni agevolate in sostituzione di lavoratori in astensione obbligatoria o facoltativa	16,625	37.3%	16,584	37.6%	18,080	36.8%	17,104	35.4%	15,586	34.9%
Esonero contributivo biennale per nuove assunzioni a tempo indeterminato nel 2016			258,612	12.5%	476,872	26.4%	236,781	22.3%	628	21.5%
Esonero contributivo per nuove assunzioni a tempo indeterminato a tutele crescenti							76,508	73.2%	189,913	73.5%
Esonero contributivo per nuove assunzioni a tempo indeterminato di studenti con periodi di alternanza scuola-lavoro o di apprendistato					148	92.6%	402	90.8%	371	82.2%
Esonero contributivo triennale per nuove assunzioni a tempo indeterminato	652,921	28.7%	1,232,260	26.1%	985,760	21.8%	514,670	18.4%	1,410	17.2%
Incentivo all'assunzione di giovani ammessi al programma 'Garanzia Giovani'					42,059	94.3%	42,592	93.3%	35,613	93.6%
Incentivo occupazione Sud					59,464	32.9%	98,893	31.2%	72,375	28.3%
Incentivo per assunzione di lavoratori beneficiari di Indennità di mobilità	2,393	1.8%	3,300	1.4%	2,974	1.0%	748	0.5%		
Incentivo per assunzione di lavoratori beneficiario o destinatari di ASpl/NA Spl							4,084	3.7%	5,385	3.7%
Lavoratori ammessi ai benefici ex lege n.193/2000									950	12.0%
Sgravio contributivo totale per i lavoratori svantaggiati impiegati nelle cooperative sociali	25,809	6.3%	26,459	6.2%	27,207	6.0%	28,113	5.8%	28,789	5.8%
Stabilizzazioni di lavoratori già impiegati in LSU									635	1.9%
Super Bonus Occupazionale (trasformazione tirocini)			4,399	94.1%	5,299	89.6%	91	87.9%		
Trasformazione a tempo indeterminato di apprendistato	74,877	75.4%	85,480	72.4%	76,335	72.1%	67,154	72.6%	72,100	74.1%
Trasformazione a tempo indeterminato di assunzioni dalle liste di mobilità	7,893	3.3%	3,807	3.1%	17,267	2.4%	2,990	3.3%		

Source: Author's elaboration based on (Inps, 2022a).

