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As A Free Climber without the Rope: The Climb to the Permanent Work of the New Italian Workers

Maria Giovanna Bosco[1], *Elisa Valeriani*[2]

[1]Università degli Studi di Modena e Reggio Emilia and Università Commerciale Luigi Bocconi, Milano, Italy

[2]Università degli Studi di Modena e Reggio Emilia, Department of Law

Abstract: This paper evaluates the impact of the Italian labour market reforms that have substantially liberalized the fixed term contract and the external collaborators. The debated question is the trade-off between employment opportunities offered by the deregulation and the employment stability and quality after entry, in particular for the new entrants. Building on previous research, we address the question of whether temporary contractual arrangements are a dead-end that traps workers indefinitely or just a stepping stone toward more stable and definitive forms of employments.
Using micro data of more than 600.000 workers entered the labour market in the years 2008 to 2015 and two different types of temporary contractual agreements (temporary agency and fixed-term contracts) as treatment, we adopt propensity score techniques to assess which one is more likely to act as a stepping stone towards permanent jobs with respect to a control group. We find significant poor evidence for the stepping stone hypothesis in the short run, with agency workers, though, performing slightly better than fixed term workers in the medium run.

Keywords: dependent labour, labour market institutions, careers analysis JEL classification: J20, J21, J41

1. Introduction

Labour economists have been facing the changing panorama of jobs in labour markets since a widespread wave of 'flexibilization' or 'deregulation' deeply changed the typical contractual profile of workers. In many Western countries, such as Spain, France, U.K. Germany, Italy, United States and Australia this process led to a sustained increase of temporary contracts, which, although varied in their nature and terms, were believed to be an instrument to facilitate the increase in occupation, especially for unemployed, youngsters and women. The idea of a stepping-stone effect for temporary jobs with respect to permanent jobs appeared at the beginning of the past decade. At that time, one category of preferred object of deregulation was investigated: the temporary agency work contract. Statistics proved that temporary agency workers rocketed, so that the literature also blossomed with several theories and explanations for the phenomenon. After the 2012 financial crisis and other waves of deregulation aimed 'at the core' of the job markets, though, it became clear that flexible, sort-lived contracts could lead not only to more occupation, but to undesired scenarios as well, with workers with a 'temporary' past ending up locked-in in a perpetual uncertainty.

Just as the economic theory behind the introduction of temporary contracts is mixed and provides both rationales against and in favour of the adoption of this instrument, the empirical focus on the existence of a stepping stone effect has been producing mixed results in the past decades. Sociological studies

underlined how the uncertaint[1]y climate in the labour market increased the fear for the future of individuals and decreased the sense of satisfaction about their working life and life as a whole.

Among the empirical studies that have estimated the stepping-stone effect or function, very few have applied the propensity score matching technique. Besides differences in time period, countries and workers groups, these studies propose a heterogeneous portfolio of methodologies and experiments and reach different and contrasting results. Some studies focus exclusively on particular types of temporary work for unemployed, other studies group different labour contracts into a unique "temporary contract" as alternative to the traditional "open-ended/permanent" contract.

This study uses a rich administrative database of labour contracts of one of the most advanced and diversified regions of Italy , including virtually all dependent workers that entered or exited the market between 2008 and 2015[1] . We compare the employment status of workers registered with 7 different types of temporary contracts with those with an open-ended contract over a period of 8 years, between year

2008 and 2015. Our research contributes to the literature on the stepping-stone hypothesis with an individual analysis of the careers of dependent workers, extending the usual transition analysis from one position to the next one, to a more articulated analysis of subsequent contracts in an eight-year time span. The data coverage may contribute to analyse the effects of the financial crises and the negative economic trends, including the globalisation and the technological change, on the use of temporary works. The main results indicate that is crucial to distinguish the individual specific characteristics of the workers and their performance and life patterns in order to access the presence or not of the stepping stones effects.

The article is organised as follows. The second paragraph provides a brief review of the literature and methodologies. The third paragraph synthesizes the institutional framework. The fourth presents the data, the fifth illustrates the methodology and the empirical strategy and the sixth discusses the results. The last paragraph concludes and discuss policy implications.

2. Literature Review

The empirical literature on the stepping stone hypothesis provides mixed evidence about temporary forms of contracts leading to subsequent more stable working positions. Factors such as age, education, sector of economic activity, time elapsed between a contract and the next, sex, business cycle, among others, justify the prevalence of a stepping stone rather than a deadlock effect. The economic theory fully justifies the existence of both the stepping stone and deadlock effects. On one side, the introduction of "atypical" or "flexible" contractual agreements may actually give an opportunity to enter the labour market where none existed before. The literature has detect two broad theoretical points of view for why temporary employment could offer a springboard to stable jobs: 1) more able workers can use temporary work to signal their skill by making themselves available for screening and 2) temporary jobs may be an opportunity to build extra human capital, social contacts and information [Blanchard and Landier (2002); Booth, Francesconi. and Frank (2002), Burgess and, Connell (2006), Ichino, Mealli and Nannicini (2008), Addison, Cotti, and Surfield (2015), Bruno, Caroleo and Dessy (2012), Esteban-Pretel, Nakajjima and Tanaka (2011)]. Whenever point 1) prevails, the screening procedure can also induce less shirking and build more stable relationships between employers and employees (Portugal and Varejao, 2009). The accent of the prevalence of the screening effect over the "buffer-stock" idea of temporary workers prevails in Faccini (2014), who presents a screening model to take into account for the relatively high mobility rates into permanent employment measured for most European countries. On the other side, the "trap" or "deadlock" hypothesis in an endless precarious

[1]Details about the definition of "dependent worker" will be given below.

condition cannot be ruled out, so that the empirical investigation only can provide some evidence.
According to Blanchard and Landier (2002), the use of temporary workers as buffer stocks increases job instability and uncertainty inside the firm, reduces investment in training, lowers workplace cooperation and workers' motivation, and harm long-run growth prospects. Moreover, temporary workers who do not belong to the high-skilled group of specialized graduates that for instance are ready to embark into traineeships as their first job, often lack soft skills too. Soft skills, as the opposite of hard skills, that pertain to the individual's ability to perform the job tasks, include tardiness, unexcused absence, fighting on the job, failing a drug test, and the like (Houseman and Heinrich, 2015). Accepting a temporary job as a first job can be a negative signal of low skill or low motivation and therefore could represent a "stigma" that induce employers to discriminate against those who accepted in their past a temporary job (Cockx and Picchio, 2012). In their introduction to a special volume on temporary work in U.K. and Australia Burgess and Connell (2006) report that on average, temporary agency workers remain detached from an ongoing relationship with the organization where they work. A bulk of the empirical literature concerning the stepping stone hypothesis tackled the emergence of temporary agency workers, in the aftermath of the deregulation that took place in Western Europe in the two past decades. A temporary agency worker does not become a dependent of the firm where he or she works, but is instead a dependent of a third party called 'temporary agency firm'. This latter firm provides personnel to the firms in need, firms that therefore do not formally hire or fire anyone whenever a new contract is started or ceased; it is all stated in the terms with the temporary agency firm. A useful resource for empirical economists engaged in investigating similar issues is the manual by Heckman, Lalonde and Smith (1999), that describes those methodologies especially devised to evaluate labour market policies and programs. These programs are usually aimed at providing individuals with training, working experiences and general and/or specific education in class or on-the-job, are often managed locally by the governments. The workers involved in these programs usually have a low level of education and skill and are required to participate actively in these programs to get some certification and ultimately get better chances to enter the labour market by being hired by firms. Even if formally, a temporary job or fixed term contract is not a program or an experiment run by some kind of government, their impact on occupation and jobs can be assessed by the same techniques suggested for experimental programs. Though, what we observe is actually the equilibrium level of workers in various working situations, stemming from the interplay of labour demand and supply, once all market forces and individual preferences and incentives have exerted their effects. It follows that one of the foremost dilemma in dealing with this topic is that data are 'observational' in their nature, and not 'experimental': this affects the typical results of experimental analysis, requiring specific hypotheses for drawing sensible conclusions. Booth, Dolado and Frank (2002), in their introduction to the Economic Journal Symposium on temporary work, summed up the various contributions that considered temporary work as a strategy to increase labour market flexibility but did not omit to consider the potentially negative side effects.
A pioneering work is represented by Booth, Francesconi and Frank (2002): their study on the British market finds positive evidence for the stepping stone hypothesis, although temporary workers report inferior satisfaction level with respect to their job, receive less training and earn lower wages than their permanent counterparts. Concerning wage and temporary contracts, a recent study on administrative data on outsourcing of non-core business service (food, cleaning, security or logistics) in Germany found that being hired though a temporary agency with respect to being hired directly by a firm implies a fall in salaries of 10%-15%. The global recession exacerbated this trend, with temporary agency firms competing with each other to obtain the best contracts and therefore pushing salaries downwards (Goldschmidt e Schmieder, 2015). Germany and Great Britain labour markets are likely to be quite different, though, as emerges from the study by Pavlopoulos (2013): the type of market segmentation

changes with culture and institutional setting, and careers depend crucially on the first type of contract obtained. The French labour market has been investigated by Blanchard and Landier (2002) in a landmark paper, where it was observed as the partial labour market reform consisting in the introduction of the fixed term contract ended up having perverse effects. By analysing data for young French workers at the beginning of the eighties, they found an increase in turnover without a reduction in unemployment duration. More recently, Fremigacci and Terracol (2013) considered the effect of a subsidization program for temporary jobs finding contrasting results: in particular, they found a significant lock-in effect when people work part-time, while there's a stepping stone effect when they work full-time. Again for France, Givord and Wilner (2015) found that fixed term contracts increase the likelihood to get a permanent contract, performing better than unemployment in this case, but the same does not hold for temporary agency contracts, from which it is much harder to flow into a permanent jobs. Positive evidence for a stepping stone effect is found by Cockx and Picchio (2012): for young Belgian workers, they find that the positive impact of past employment on subsequent employment is larger than that of past unemployment on subsequent unemployment, although in their simulation they find that in the short run, short-lived jobs are not stepping stones. Another landmark paper is the one by Autor and Houseman (2010) for the United States. When assessing the effect of a program called "Work First", they found that temporary work is not successful at all in leading workers to more stable positions, but rather can lead to even lower future wages. In this case, the comparison was made with workers directly hired by the same firms adopting also temporary workers. Addison, Cotti and Surfield (2015) point at the different weight and perception of temporary work in the US, where also highly priced contractors or consultants are considered temporary workers and find positive evidence for the stepping stone effect, in line with what found by Booth, Francesconi and Frank (2002), but still with a loss in term of wage rates. Esteban-Pretel, Nakajima and Tanaka (2011) do not find either evidence against or in favour of the stepping stone hypothesis for a case of young Japanese workers, although they find that in a 5 -10 years horizon, accepting a short-lived job has a negative effect with respect to remaining unemployed on the probability of an individual to find regular employment. Using administrative data, Amuedo-Dorantes, Malo and Muñoz-Bullón (2008) found for Spain that temporary agency workers have less probability than their 'direct-hire' counterparts to be taken in as permanent workers. Damas de Matos and Parent (2016) in their study on firms' age and type of contracts in Portugal find an indirect signal of absence of stepping stone, as they find that young firms tend to hire mostly through fixed-term contracts and do not tend to switch from fixed-term contracts to open-ended contracts as they age. Cai, Law and Bathgate (2014) use Australian data to find that the fact of having a part-time position increases the likelihood to get a full-time position with respect to those out of the labour force, but they also find that part-time work does not have a stepping stone effect towards permanent work if compared to unemployment. Italy's case has been lively debated as well since the beginning of the last decade. Ichino, Mealli and Nannicini (2005) found evidence for the stepping stone hypothesis for temporary agency workers from Sicily and Tuscany. Ichino et al. (2008) discussed in detail the estimators to be used in the case of non-experimental data. Using the survey on Labour Force from the Italian Institute of Statistics, Barbieri and Sestito (2008) evaluated the probability of temporary agency workers exiting into other contractual forms, concluding that women and adults are better off, in areas with low unemployment. The authors also discuss on the quality of the working position and workers features, where auto-selection into a given contract can be at work. Berton, Devicienti and Pacelli (2011) using the Work Histories Italian Panel, found that fixed term contracts, apprenticeships and training program do work as springboards towards permanent jobs, but the same dos not hold true for freelance contracts holders. They also detect a trapping effect, as the most likely outcome out of a contract is the permanence in the same contract. Using the same type of administrative data we use at regional level for the national level, Lilla and Staffolani (2012) find that the chances to get an

open-ended contract seem to have been mostly offered to those individuals with more experience, who also have the longest lasting temporary jobs. Therefore there is no evidence for stepping stone for young workers in the short run; young workers who have spent many years on education have low chances to start with a permanent job, however their temporary jobs are more easily transformed into permanent ones. Although is acknowledged that fixed-term contracts show the highest chance of transformation in permanent contracts, this analysis lacks the counterfactual analysis usually undertaken through the propensity scores estimates. Bruno, Caroleo and Dessy (2012), analysing the Italian part of the EU-SILC 2004-2007 panel, find that that temporary contracts have a positive impact only on men's transitions to permanent employment. School leavers, workers in the South, as well as women, are instead rather penalized after a temporary job. Bosio (2011) presents a duration dependence analysis in order to evaluate to what extent temporary contracts are a stepping stone towards permanent jobs in Italy in the period 1992–2002. He finds that the probability of moving to a permanent job depends on the type of temporary job: after the 1997 labour market reform, temporary agency jobs and apprenticeships exhibit lower transition rates towards a permanent job than the ones of other forms of temporary jobs. Picchio and Staffolani (2013) follow a sample of 22,00 young Italian labour market entrants starting a temporary job in 2009 over time until the mid of 2012, when they enter a permanent job and estimate their hazard rate of entering a permanent job by splitting them in apprentices and other types of temporary workers. They found that from the third year since the sample entry, apprentices show a hazard function towards permanent jobs significantly higher than that of temporary workers, concluding that apprenticeships are more effective than other forms of temporary contracts in leading workers to a stable job relationship, especially within the same firm.

3. The institutional setting

The history of the Italian labour market is known to be troubled, and many reforms and "counter-reform" have been involved for decades without, however, solving some structural problems in the country. Until the economic and financial crisis of 2008, the central problems that reforms sought to resolve were the inequality between the North and the South of the country, with a full employment situation in the north and a high unemployment, especially among young people and women, in the south and the growing numbers of precarious workers in the public service[2]. Two major reforms enforced in 1997 and 2003 have to be considered as influential for the opportunities offered to the new entrants and the flexibilisation of the labour market. The 2008 crisis has fundamentally changed the picture that has been, even in its own
negativity, stable for decades involving the regions of the north, which until then attracted the labour market, and making the problem of the difficulty of accessing the labour market a national theme and no longer restricted to some areas of the country.

All industrial sectors (construction, textiles, and semi-finished products) have entered a recessionary phase that has not yet been resolved, thus reducing the opportunities for the young workers entering the labour market.

This situation, coupled with a negative macroeconomic scenario, has led to the need for new mechanisms for accessing young people and women to the labour market, and the post-2008 reforms had this objective. The latter governments have therefore decided to completely reverse the assumption that had supported the Italian labour policy since the seventies, seeing in the permanent work the legitimate aspiration of every worker, emphasizing, on the contrary, the virtues of flexibility and temporary jobs as arrangements to enter the labour market and "climb it" until getting an open-ended permanent job.

In fact, the ultimate goal has not changed but the path to achieve it did not defend the workers to become precarious in front of the frenetic evolution of the global economy and competition. Introducing

elements of flexibility to enter the labour market and supporting them with financial inc[2]entives, the 2012 reform ultimately trusted that the labour market entry, albeit temporary, would later allow workers to climb the market until they get a stable job. As a reform intended to defend the worker with more attractive permanent contracts, reducing the number of temporary contracts or making them more expensive, the reform has instead come back to stiffening the rigidity of the labour market.

With these assumptions and these hopes in 2015 another major reform was introduced, the so called "Jobs Act", which has determined a deep change in the Italian industrial relations. Bringing at completion a reform process begun in the 1990s, the Jobs Act has introduced a new contract type meant to replace the permanent contract 'contratto a tutele crescenti' implying a substantial downsize of the obligation for workers' reinstatement in case of firms invalidly firing them. The new permanent contract is therefore deprived of the substantial previous requirements of an open-ended contract. Although the effectiveness of the law in boosting employment growth is questioned (Fana, Guarascio, Cirillo, 2015), it has represented an intervention in the direction of introducing flexibility at the core of the permanent contracts agreements. Contracts types changed significantly across the time lapse we consider here (2008-2015): new contracts were introduced and some features of the existing contracts were modified. For our analysis, we adopt a reclassification of the Italian contractual agreements meant to aggregate those contracts sharing significant common characteristics into a short list of 7 contract types.

4. The data

We use administrative data stemming from the elaboration of the 'Communication Obbligatorie', mandatory communications about employment that every employer in Italy has to implement when- ever a worker is hired, fired, when her contract is prolonged or transformed into any of its specific characteristics. In particular, we use the data for the northern region Emilia-Romagna, where the elaboration for statistical purposes of the data started in 2008. The database is constantly updated with new flows registered every year, and allows for a level of analysis of the dependent labour market hardly possible before. In the region, every year about one million of new contracts are started and about the same number is ceased. Features of the workers and employers can be matched. Whenever a communication is made, the database classify the features of the worker, as age, sex, nationality, level of education; feature of the contract, as length, exact typology, full time or part time, geographical area, sector of economic activity, type of job in terms of skill and professional category, employer id.

From the raw data we rebuild the careers of the workers: as such, we are able to observe a number of individuals along many years of their working life, included the time elapsed between adjacent contracts. As of today, we can observe about 600,000 individuals yearly during the 2008 – 2015 time spam[3].

[2] Substantial labor market reforms were adopted in Italy at the beginning of the 1990s, with the agreements putting an end of the so-called "scala-mobile", an automatic system of wage indexation in 1993. Reforms concerning new, temporary and atypical job contracts have been gradually introduced since the mid-1990s. The first major intervention has been the "pacchetto Treu", from the name of the Labor Minister at the time. The package implied a decrease of the drastic sanctions in case of violation of the fixed term contracts discipline (conversion of fixed-term contract into an open-ended one). Atypical labour contracts were spurred by reducing social security contributions and pension provisions and by removing automatic transformations of fixed term contracts into open-ended ones. The package eased the regulation of new apprenticeship and work-training contracts and set incentives for on-the-job training (stages), temporary work via private agencies and intra-regional labour mobility. The second important milestone in reforms was the Biagi reform in 2003, which attributed legal content to additional temporary work arrangements (job on call, job sharing, supplementary work, staff leasing, "lavoro a progetto", etc.), defined in more detail the functions of work agencies and increased the number of services they could offer (CNEL, 2006). To provide a glimpse of how much these reforms have impacted on the regulatory framework, we could report the Employment Protection Index (EPL) constructed by the OECD (2016): in 2008 Italy ranked broadly mid-field in OECD comparison (twenty-fifth out of forty countries) with the EPL indicators being 1.89 against an OECD average of 1.94. Back in 1990, Italy ranked fourth out of twenty-six countries in the same decreasing order of protection (Battisti and Vallanti, 2013). Moreover, when looking at the most recent data on employment protection, the deregulation at the margin triggered a decrease in the employment protection of temporary workers from 4.75 in 1997 to 2 in 2013, while the related indexes for permanent workers basically remained unaltered.

In order to perform a test for the existence of the stepping stone effect, we built a subsample of the database according to an arbitrary time criterion: we consider all the individuals appearing in the database with a least one contract started in 2008 and having up to ten contracts in the 2008 – 2015 time spam. This criterion also helped us in strengthening one of the preconditions necessary to perform the analysis according to the propensity score methodology we chose to adopt. This will be discussed below further. This resulted in a set of 631,882 workers and a total of 2,127,330 contracts. The distribution of the number of contracts in our sample is provided in Table 2. We notice that only a relative majority of workers hold only one contract during the eight years considered. This suggests a first piece of evidence: about 68% of the dependent workers who entered the labour market after 2008 are entitled with fixed term or temporary labour contracts, an epochal change if one considers that the bulk of the labour force in 2008 [3]was still represented by "traditional" permanent jobs. As of today, the permanent job position has been reshaped by the "Jobs Act", so that comparing new contracts (after 2015) with the previous ones presents some issues. Moreover, most people do not experience any stepping stone, since they start with only one contract that carries along all the time spam and remains their unique contract (excepted for unobserved voluntary changes into independent jobs, retirements and other reasons to abandon the dependent labour market).

Table 1: Workers with at least one contract started in 2008 and number of contracts held (up to five contracts, 2008 – 2015).

Number of contracts	Workers	Percentage
1	203,902	0.32
2	114.726	0.18
3	79.352	0.13
4	58.548	0.09
5	44.771	0.07
6	34.351	0.05
7	27.954	0.04
8	33.246	0.05
9	20.199	0.03
10	14,833	0.02
Total	631,882	100

Some contracts overlap for the same person, since it happens for part-time workers and for teachers, for example, to have more than one job at once. The contractual agreements, covering virtually all the existing (in 2008) dependent labour contracts, were aggregated according to the eight types of contract. More specifically, only some of them can be really defined "dependent labour" contracts, while others are

somehow different (as domestic labour). Descriptive information on the first work arrangement[4] observed

and workers features are given in Table 1.

This distribution provides a reliable picture of the demographic, educational and skill features of the

[3]Some caveats are in need, though. First of all, the world of non-dependent labour, as professionals and entrepreneurs, is not included in the database, so that we cannot surrender to the temptation of linking these data to the official employment data. Although the total number of individuals appearing at least once in the database comes very close to the statistical stock of de- pendent workers in the region, we cannot forget that the bulk of permanent workers who have never been subjected to any communication simply does not appear. As time goes by, this phenomenon will fade away, with the older permanent workers taking their retreat and then being registered, and new market entrants being registered for the first time as well. Secondly, we do not observe the status of the workers before they appear for the first time in the database and during the time elapsed between adjacent contracts. To fill this gap, we would need to cross our database with the INPS (National Institute for Social Welfare) data on unemployment, although for younger workers we can suppose that their very first contract is observed. Apart from this, the potential of insight into the labour market is huge. We can detect typical careers patterns according to various points of view and link the data to the firms' accounts. We can answer to multiple questions concerning youth employment, female labour, days worked, geographical patterns

workers, since many of them, as individual characteristics, are likely to persist through time, while others, as contracts type and sectors could change from one labour spell to the next. The empirical and the anecdotal evidence shows that on average there is a strong resilience by the workers in the same sectors, while the growing need for functional and workplace flexibility offered a broad range of contractual arrangements with flexible schedules, work-time, compensation as well as skill requirements. As table 2 shows, some basic characteristics of temporary workers in Italy are consistent with the

Table 2. Descriptive statistics of workers by working arrangement (mean values)

	CTI	CTD	CAI	LPAR	ELAV	LDOM	LINT	SOM
	Open-ended contracts	Fixed term contracts	Apprenticeships and access-to-work	Para subordinate work contract	Internships	Domestic workers on call	Jobs	Temporary agency work contract
Individual characteristics								
Age	36	35.94	20.92	38.25	22.63	41.11	32.87	31.18
Female	0.4	0.51	0.42	0.47	0.57	0.85	0.56	0.42
Foreign	0.27	0.28	0.22	0.08	0.11	0.91	0.17	0.24
Education level								
Primary School	0.03	0.06	0.01	0.02	0.01	0.03	0.03	0.02
Junior High School	0.35	0.42	0.53	0.26	0.31	0.19	0.53	0.37
High School	0.23	0.21	0.27	0.28	0.32	0.06	0.23	0.3
University Degree	0.09	0.07	0.04	0.24	0.23	0.03	0.03	0.07
Job characteristics								
Duration in days[a]	1225	173	341	326	120	454	364	154
Part time	0.227	0.253	0.198	0.059	0.12	0.808	0.23	0.161
Waiting time in days[b]	169	219	325	208	322	235	289	147
Overlapping[c]	0.01	0.01	0.01	0	0	0.06	0.01	0.01
Industrial Sector								
Industry	0.27	0.15	0.25	0.12	0.25	0.01	0.04	0.58
Agriculture	0.01	0.2	0.01	0.01	0.01	0	0	0.01
Trade and Tourism	0.17	0.26	0.36	0.14	0.25	0.01	0.65	0.18
Services	0.4	0.24	0.22	0.51	0.44	0.97	0.28	0.2
Education[d]	0.04	0.08	0	0.18	0.02	0	0.02	0
Construction	0.11	0.07	0.16	0.04	0.03	0.01	0.01	0.03
Skill level								
Operators or workers	0.098	0.068	0.053	0.017	0.028	0.003	0.027	0.228
Armed forces	0	0	0	0	0	0	0	0
Legislators, entrepreneurs, top management	0.015	0.002	0.002	0.021	0.002	0	0.001	0.003
Clerical workers	0.126	0.069	0.116	0.108	0.222	0.002	0.042	0.136
Scientists, professionals, highly specialized workers	0.073	0.08	0.019	0.284	0.137	0.001	0.054	0.013
Unqualified workers	0.198	0.318	0.034	0.038	0.058	0.782	0.167	0.214
Qualified professionals in trade and services	0.14	0.232	0.374	0.123	0.193	0.2	0.656	0.125
Technical	0.159	0.066	0.091	0.36	0.27	0.004	0.027	0.092
Artisans, farmers, specialized workers	0.189	0.165	0.311	0.049	0.091	0.008	0.026	0.148
N	**195,101**	**268,169**	**31,210**	**47,936**	**10,266**	**20,088**	**10,637**	**45,691**

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Notes

a:For open-ended contracts of contracts lasting more than 5 years, the maximum allowed is 1826 days. Part time contracts were weighted by 0.5 as for length.

b: Only for those individuals with more than one contract in the 2008-2012 time span, as number of days between the end of the first contract and beginning of the second contract, with non-overlapping contracts

c: Percentage of individuals with more than one contract at once, after the first one registered

d: Workers in the Education sector, as a proxy for employees in the Public Sector. They were subtracted from the Services sector

As table 2 shows, some basic characteristics of temporary workers in Italy are consistent with the mainstream in industrialized Western economies. For most temporary workers certain individual characteristics, occupations and economic sectors, have a negative influence on the probability of transitioning from a temporary to a permanent job. Younger workers are engaged in apprenticeships and internships, but the way to the open-ended contracts is quite long. The age of fixed-term workers is higher than temporary agency workers. Domestic workers are by 85% female and aged 41, the highest mean age. As for age, para subordinate and open-ended workers follow. Para subordinate workers are often professors, scientists and professionals who work independently for long periods of their working life, as

emerges from their educational attainment. The educational attainment of foreigners is usually low[7]. The

education attainment of temporary workers is pretty low, with the highest levels (University degree) for Para subordinate works and internships.

More than 40% of workers with open-ended, fixed-term and temporary work agencies contracts have a low educational level (Junior High School or less). Open-ended contracts are the most popular in service and industry, while jobs on call are especially concentrated in Trade and tourism. Para subordinate workers are those with the highest average skill level, while female domestic workers are those with the lowest skill level.

Para subordinate workers and internships prevail in services (about 50%). Domestic worker is the dominant contract in services, while jobs on call (LINT) prevail in the trade and tourism sectors. Manufacturing prevalently employs typical workers with open-ended, apprenticeships or internships contracts. Unqualified professionals concentrate on fixed-term contracts

Fixed term contracts on average last about six months, while the shortest duration is registered for temporary agency workers. It must also be underlined that these workers are also those waiting less between the first contract and the following one, while it takes really long to find another job after an internship.

The Kaplan-Meier estimates of the duration of the open-ended contract compared with the other 7 temporary contractual arrangements are presented in days in figure 1. The maximum duration is 1826 days (5 years) as the contracts ending December 31st 2012 were artificially closed on that date. As expected, open-ended contracts (CTI) have the longest duration, as 50% of the first contracts started in 2008 are still

[4] The term "first work arrangement observed" is somehow arbitrary, since there are a few cases (about 7000) where two contracts overlap; when the start date of the contracts is the same, it become arbitrary define one of them "first" mainstream in industrialized Western economies.

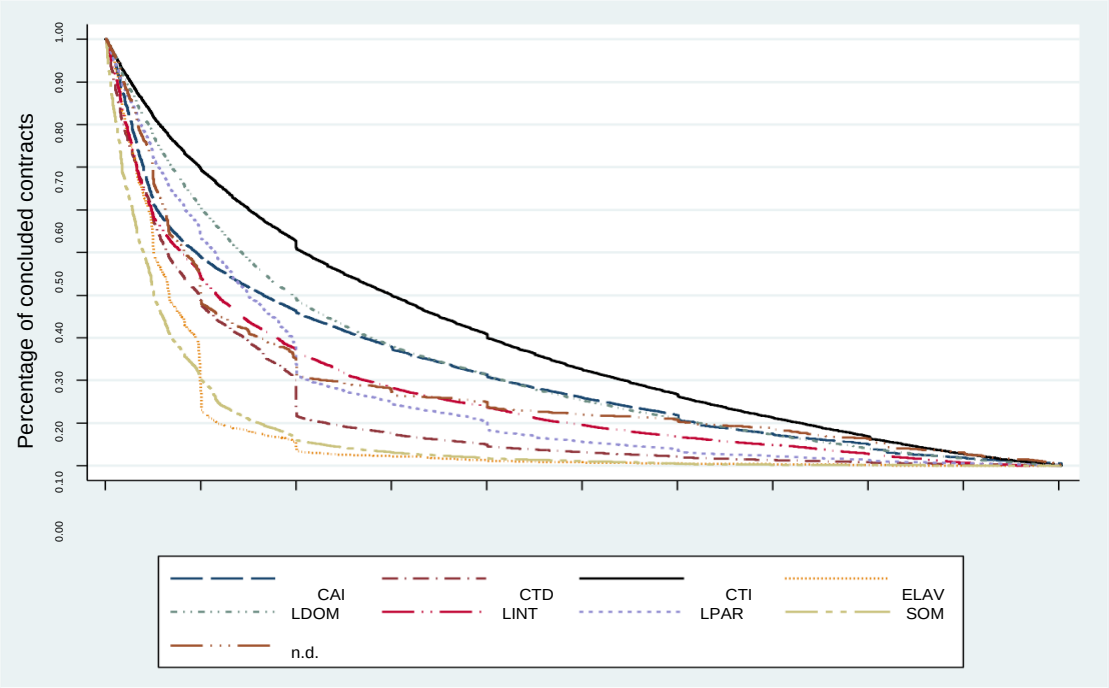
alive after 546 days (18 months). Also domestic labour (LDOM) seems to be quite resilient to time, as the demand for this service is not that much correlated with the economic cycle. Internships and temporary work contracts are the most short-lived, as 50% last on average about 90 days (3 months). Fixed term contract (CTD) lie in-between, as 50% last about 180 days but drop to 12% after 12 months. The durations of contract is an important variable to take into account when measuring the stepping stone effect, as it may be that longer temporary contracts are more likely to lead to stabilization of the working position than shorter spell contracts. A key point for our analysis is given by transitions. Looking at first contracts in 2008 and observing by what kind of second contract they were followed (if any) we can typically observe that most contracts are followed by same-type contracts. In particular, we focus here on what happens after all types of contracts but jobs-on-call (LINT) and domestic labour (LDOM), for their very sector-specific and usually unstable nature makes them quite different from more stable and common

contract types[8] .

[5]

We have 631,882 workers in the database with at least one contract in the 2008-2015 time spam and 427,980 workers with at least two contracts in the same time spam. Moreover, we exclude those workers with overlapping contracts, so that we finally consider 373,902 workers. Transitions are reported in Table 4

Figure 1: Kaplan-Meier Estimates of Job Durations



The estimates in Figure 1 reveal that the median duration of all contracts, but open-ended ones, is less than one year. In particular, internships (ELAV) have a median duration of 92 days, temporary agency contracts (SOM) have a median duration of 73 days, and fixed-term contracts (CTD) have a median duration of 119 days. Overall, among temporary jobs, only domestic labour and Para subordinate workers have a median duration over six months.

[5]Also for the reason that foreign educational titles are not acknowledged by the national system, even for female foreign domestic workers.

Table 3: Matrix of transitions from the 1st to the 2nd contract, by type

	CTI	CTD	CAI	LPAR	ELAV	SOM	Others	
work	Open ended	Fixed term	Apprentice ships and access to work	Para subordinat e work	Internships	Temporary agency	Others.	TOTAL
Open-ended	58,094	21,927	1,474	2,977	341	5,375	355	90,543
Fixed term	27,508	138,343	4,570	5,097	1,633	7,573	694	185,418
Apprenticeships and access to work	4,555	6,041	7,371	812	811	1,569	62	21,221
Para subordinate work	4,623	5,123	611	20,111	397	764	91	31,720
Internships	1,404	1,933	1,358	704	1,560	499	73	7,531
Temporary agency work	6,981	9,489	1,349	722	337	16,873	121	35,872
Others	394	511	13	81	8	60	530	1,597
Total	103,559	183,367	16,746	30,504	5,087	32,713	1,926	373,902

When looking at transitions (table 3), we notice that a large number of fixed-term contracts are followed by open ended contracts. This may lead to an obvious fallacy: since a high number of open-ended contract were preceded by fixed-term contracts,[6] then one could conclude that there is a stepping stone effect. The fallacy lies in the fact that most fixed-term contracts are followed by fixed term contracts, so relatively speaking, one should take into consideration the "what if" condition, exactly addressed by the propensity score analysis addressed below. From this point of view, the duration of contracts should play in favour of the stepping stone, so that even if a trapping effect can already be supposed, correcting for duration may lead to mixed results.

Table 4 reports the time elapsed (mean values) between the first and the second contract for the same categories as in Figure 1. We cannot observe what workers do in-between contracts, so that one can either suppose they may be working informally, or as autonomous workers, or be unemployed. In any case, the longest the duration of "non-dependent employment", the more likely it is to be wasting human capital and training. On the other hand, the shorter the intervals, the quickest the growth of human capital. One could conclude that the stepping stone effect should be stronger as the time elapsed between contracts is shorter, as the screening strategy of firms by firm and self-signalling for quality and commitment of workers could be at work.

The time lapse between one contract and the next is on average of 169 days for open-ended contracts, only longer than temporary agency workers 147 days. All other types of contracts have longer average waiting periods, from 208 to 325 days.

Table 4: Time elapsed between the end of the 1st and the beginning of the 2nd contract, by type

	CTI	CTD	CAI	LPAR	ELAV	SOM	Others
access to	Open ended	Fixed term	Apprenticesh ips and work	Para subordinate work	Internships	Temporary agency work	Others
Open-ended	110	257	178	238	373	210	577
Fixed term	206	187	274	352	597	306	662
Apprenticeships	245	377	257	436	585	360	358
Para subordinate work	243	311	230	149	459	357	669
Internships	222	376	217	316	306	423	1012
Temporary agency work	124	186	133	377	408	96	678
Others	236	209	152	261	354	271	301

[8] We also consider transitions into all but jobs-on-call and domestic labour contracts

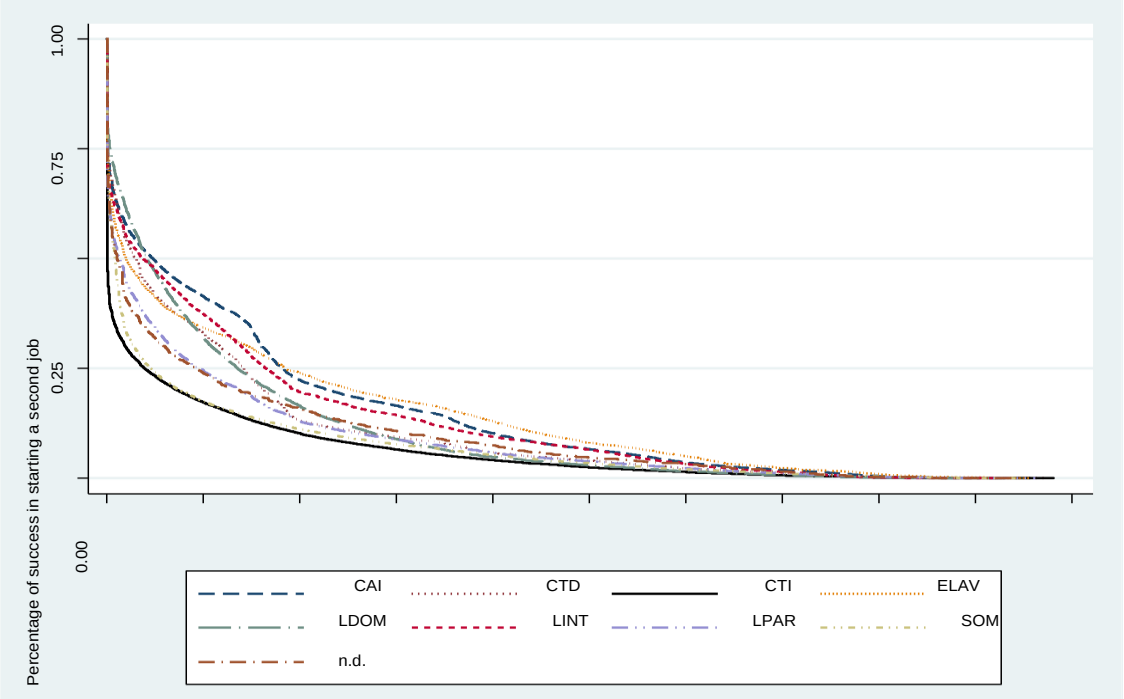
Fixed-term contracts show the lowest mean waiting time between contracts (no overlapping) while apprenticeships show the longest time intervals. Temporary agency workers do not differ much from fixed- term workers in their transitions, and their average waiting time to open ended- positions is well below the one of fixed-term workers, being superior only to the waiting time from open-ended to open-ended. In the next paragraph we will illustrate the methodology and explain the rationale after this evidence to our empirical modelling.

We also adopted the Kaplan Meier approach to compute the "waiting time" between the first contract undersigned in 2008 and the following one, for those individuals who have more than one contract in the 2008-2012 period, (but not-overlapping contracts). This seems a crucial information to get an insight of which initial type of contract performs better in terms of reduced (probably?) unwanted spells of non- employment. Similarly, one could ask with another analysis which type of second contract performs better in terms of decreasing the waiting time after the end of the first contract.

Figure 3 illustrates the waiting time in days between the end of the first contract and the second contract. The median value of the waiting time for open-ended contracts is 1 day. The waiting time increases for temporary jobs; temporary agency workers are those who wait less before entering a second contract (median of 16 days), followed by Para subordinate workers (25 days). The situation is instead more dramatic for those whose first contract is an apprenticeship (median of 88 days). From the figure, we notice that 50% of the workers find a second job, after the first one registered, in less than six months. The average waiting time across all types of contracts is 163 days.

Focusing on the open-ended contract as a second contract, it is interesting to assess how efficient (or rather, not-efficient) is the eventual transition to a permanent contractual position, starting from any of the possible contractual types observed. Table 4 collects the average and median waiting time in days for workers who end up with a permanent position as a second contract.

Figure 2. Kaplan-Meier estimates of the waiting time between the first the second contract.



0 182 364 546 728 910 1092 1274 1456 1638 1820

Waiting time in days

5. Methodology and empirical finding

The nature of our data is observational and non-experimental, so that we turned to the methodologies illustrated by Heckman et al. (1999) to analyse the effect of active labour market programs. In particular, our data have very similar features to those used by Amuedo-Dorantes, Malo and Muñoz-Bullón (2008) for Spain, so we partially rely on their approach. The main difference lies in the size of the dataset: we virtually use all the dependent labour market workers who started at least one contract in the region in 2008, and therefore we have a large number of observations and variables that represent a plus for the hypotheses upon which the propensity score methodology relies. The second difference is that we run a double test. First, we search for a stepping stone effect for those workers who had a **temporary agency work (SOM)**; second, we search for a stepping stone effect for those workers who had a **fixed-term contract (CTD).** For both these categories, we test the existence of a stepping stone against the universe of all possible working contracts in our database.

This approach conditions the event of taking up an open-ended/permanent job though Temporary agency Work (SOM) or Fixed Term Contract (CTD) versus not taking up those two temporary contracts on elapsed duration in months. Specifically, future outcomes of those temporary workers entering the SOM or CTD job after a certain elapsed duration are compared to the hypothetical situation of them not taking up a SOM or CTD job and remaining temporary workers with other contracts for at least one extra month.

That is, the transition from temporary to permanent work will be evaluated against the largest possible control group in both tests. The idea of evaluating a causal effect from one event to another was formulated by Rubin (1974) who argued that "The causal effect of a measure for a specific person is the difference between the likely outcome of a person's participation in a measure and the likely outcome of a person's non-participation". In this specific context, we want to investigate the effects of 1) having had a temporary agency contract (SOM) or 2) having a fixed-term contract (CTD) on the final outcome called "being hired through a permanent or open-ended contract. The scenario is that we don't have the "treatment" randomly assigned to workers, since we could not force a worker to accept one specific contract for experimental reasons, but we have pre-treatment information (such age, sex, etc.) that can affect ex-ante the probability of entering into a specific treatment, that can lead to self-selection into a treatment. If we call Y_1 the outcome of an individual's participation in a measure (in turn, a SOM or CTD contract) at some point in time during the period under the analysis, and Y_0 the outcome otherwise, for a given individual *i*, the effect from undergoing the measure can be defined as:

$$\Delta i = Y_1\, i - Y_0\, i$$

If we suppose *D* is an indicator variable that equals 1 for individuals who participate in the measure (treatment level) and zero for individuals who do not participate (control level), and let *X* be a vector of variables that affect both whether an individual chooses to accept in turn, either a temporary agency work or fixed term job, as well as the employment outcome under analysis, then we can evaluate different impact measures. First, we can evaluate the "absolute" benefit from undergoing a given measure for the

whole of the individuals, regardless of their participation in the measure or not. This is called "average treatment effect" (ATE):

$$E(\Delta) = E(Y_1 - Y_0)$$

If this is positive, participating in the measure, or more formally, undergoing the treatment should be mandatory as net gain would positive. Secondly, there is a second measure that evaluates the effect for

only those who actually participated in the measure and is called "average treatment effect on the treated" (ATET):

$$E(\Delta|D = 1) = E(Y_1 - Y_0 |D = 1) = E(Y_1 |D = 1) - E(Y_0 |D = 1)$$

If this is positive, those workers who underwent the specific treatment (temporary agency or fixed term) increased their probability of entering an open-ended job as the next contract. The obvious difficulty is that evaluating $E(Y_0 |D = 1)$ is pretty demanding, since this would imply answering the question: "what would have happened if the individual who underwent the treatment did not get the open-ended job". We cannot answer this question as this cannot be observed (our data are observational, not experimental). To solve the problem, the data must satisfy a set of conditions, under which we can find good "counterfactuals" to use as proxy of the situation depicted under $E(Y_0 |D = 1)$. The first is called the conditional independence assumption (CIA).

The CIA assumption says that only the covariates X affect both the treatment and the potential outcomes. After conditioning on covariates, when no unobservable variable affects both treatment assignment and the potential outcomes, the potential outcomes are conditionally independent of the treatment. Formally,

$$Y_1 , Y_0 \perp D|X$$

The CIA holds under two circumstances: 1) when the treatment is randomized (not our case) or 2) when treatment and control observations can be matched using a relatively rich set of covariates. As our database is extremely rich in terms of individual characteristics and local labour market conditions, we can rely on the use of the control group to estimate the missing data:

$$E(Y_0 |D = 1, X) = E(Y_0 |D = 0, X)$$

In other words, the average causal effects of, in turn, temporary agency workers or fixed term contract workers, can be consistently estimated using a group of, in turn, non- temporary agency workers or non- fixed term contract workers with a distribution of exogenous variables similar to the distribution of the, in turn, two treated groups. The second condition that must be fulfilled is the common support assumption (CSA; Rubin, 1979) or overlap assumption. The CSA requires that for each treated worker in the treatment group, there exists another non-treated worker in the control group that can be used as a matched comparison observation. In other words, the overlap assumption requires that each individual have a positive probability of receiving each treatment level. Although no formal test for the CIA exists, since trying to test for the CIA would imply testing for the non-existence of hidden, unobserved variables likely to alter the selection into treatment, we proceed in the course of the analysis to select the most appropriate and common predictors that explain the individual characteristics, the education level, the skill level and the work characteristics.

Second, it is possible to perform a sensitivity analysis for the propensity score estimates (Becker and Caliendo, 2007; Aakvik (2001) and therefore assess the robustness of the inference with respect to potentially biasing unobserved factors. In the next subsection, we will therefore observe the propensity score histogram by treatment statuses to check if the distribution of the treated and untreated individuals (after selection) overlap; we will also apply the Rosenbaum (2002) bounding approach to test for the robustness of the estimates to unobserved variables.

Two Propensity Score models are estimated to capture the effects of two different contractual arrangements in the same period of exposure (2008-2015) and the same outcome, the open-ended contract.

5.1 Temporary Agency Work

The first model estimates the effects of entering the labour market with a Temporary Agency Work contract. The sample consists of 125,842 workers as specified by the hypothesis the steps illustrated in Annex 1. These workers represent the starting sample upon whom we run our tests, but the effective number of workers tested will be lower since we will observe only those who have at least three contracts in the 2008-2015 time lapses. Not all of the 125,842 workers have at least three contracts; some of them will therefore be dropped. The CIA assumption does not have a formal test, but as mentioned above, we rely on the richness of our covariates to take it for granted. As for the CSA assumption, we can look at the distribution of the probability that every individual has, given the covariates *X*, to obtain a permanent contract as their third contract observed, that is our outcome. If this probability is distributed evenly between treated and untreated groups, we can conclude that the CSA is fulfilled. Plotting the densities of the propensity scores before and after the matching we find that actually the matching is efficient is finding an accurate group of control individuals (Figure 3).
The covariates we use in probit matching are both internal XI *and* external XE and relate to the situation of the second contract observed (no matter the year), where:

XI : *Sex, Foreign, Age, Age*2*, UniversityDegree*

XE : *Unemploymentrateintheprovince, Provinceof theEmployer*

Foreign is a dummy equal to 1 if the worker is not Italian. Age is observed at the beginning of the contract. Age squared captures the potential non-linear effects of experience; University Degree is a dummy equal to 1 if the worker has at least a university level education. The unemployment rate is the rate in the province in the year of the start of the second contract. The province of the employer is a categorical variable for the nine provinces of the region in order to consider the worker mobility. The matching was performed for all workers, for those aged 18-24 and for those aged 25-29 respectively. We start by testing the probability of getting a permanent job as third contract (CTI3) and continue with the tests for the probability of getting a permanent job as fourth (CTI4), fifth (CTI5), and so on, until the tenth contract (CTI10) observed (which is the limit we chose to adopt in the time span). The rationale is that employers might require more time or more contracts to screen their workers and offer them a permanent position; or rather, they might be waiting for the business cycle to go back on the ascending phase before hiring on a permanent basis. Another possible explanation is that entering an open-ended position becomes more likely as cumulative experience increases. Therefore, we might find some positive stepping-stone effect when observing not the immediate working experience after the second, but the fourth, fifth, and so on. Table 5 summarizes the results for the ATET (Average Treatment Effects on the Treated) coefficients according to the groups of all workers, for youngsters aged 18-24 and young workers aged 25-29. This focus on the younger workers may help understand if some stepping stone or trapping effect has more likelihood to appear for different age cohorts.

Figure 3: Propensity score densities by treatment status before and after matching, Temporary Agency Work

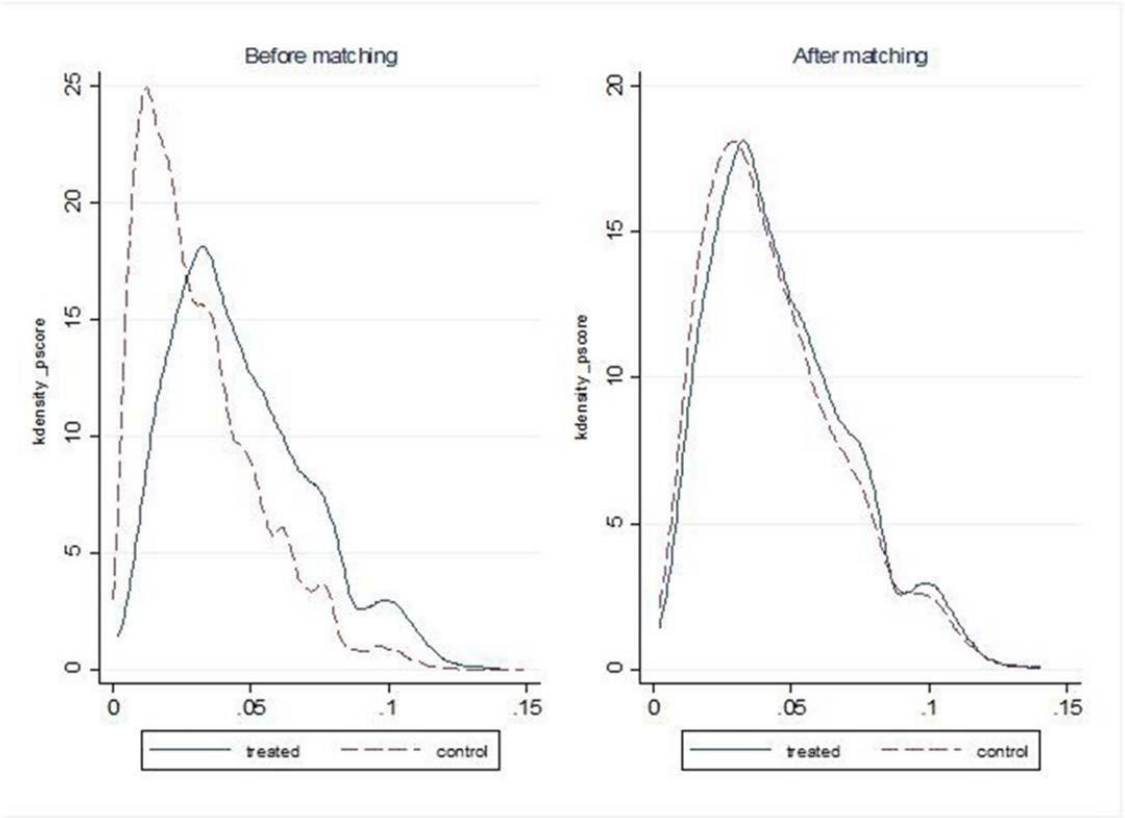


Table 5: Propensity score estimates, Open-ended contract as third contract, ATET results, Temporary
Agency Work as treatment

	ATET	T-stat	S.E.
CTI3			
All workers	-0.071	-4.72	0.015
Aged 18-24	-0.018	-0.53	0.034
Aged 25-29	-0.097	-2.9	0.0336
CTI4			
All workers	-0.047	-2.8	0.016
Aged 18-24	0.02	0.57	0.035
Aged 25-29	-0.013	-0.35	0.036
CTI5			
All workers	-0.012	-0.68	0.018
Aged 18-24	-0.036	-0.9	0.041
Aged 25-29	-0.041	-0.99	0.042
CTI6			

All workers	-0.005	-0.27	0.021
Aged 18-24	-0.082	-0.18	0.044
Aged 25-29	-0.009	-0.19	0.051
CTI7			
All workers	-0.01	-0.41	0.024
Aged 18-24	-0.085	-1.61	0.053
Aged 25-29	0.014	0.26	0.054
CTI8			
All workers	0.039	1.36	0.029
Aged 18-24	0.027	0.46	0.061
Aged 25-29	0.096	1.41	0.068
CTI9			
All workers	0.037	1	0.022
Aged 18-24	0	0	0.079
Aged 25-29	-0.08	-0.81	0.098
CTI10			
All workers	0.16	2.59	0.061
Aged 18-24	-0.047	-0.31	0.153
Aged 25-29	0.333	2.26	0.147

Results in Table 5 are partially significant for CTI3, CTI4 and CTI10 only. In the case for CTI3 and CTI4, the significant results for all workers are negative, implying the likely presence of a trapping effect of the temporary jobs, rather than a stepping stone. A negative result also appears for workers aged 25-29 for CTI3. Not-so-young workers seem to be particularly penalized, but since the coefficient is smaller, it may be that even older workers suffer from an even stronger trapping effect. A strange result appears for CTI10. The coefficient becomes positive and significant for all workers and workers aged 25- 29. This may imply that some stepping stone effect exists, but only after several other working experiences after the second temporary contract as second contract in the working life and would match the rationale exposed above on the importance of cumulative experience as a key to enter a permanent working position.

5.2 Fixed-term contract

The second model estimates the effects of entering the labour market with a Fixed term contract. The sample consists of 70,816 workers as specified by the hypothesis the steps illustrated in Annex 2. These workers represent the starting sample upon whom we run our tests, but the effective number of workers tested will be lower since we will observe only those who have at least three contracts in the 2008-2015 time lapses. Not all of the 70,816 workers have at least three contracts; some of them will therefore be dropped.

The CSA assumption seems satisfied, as the distributions before and after the matching of the treated with the control group provide densities as in Figure 4.

Figure 4: Propensity score densities by treatment status before and after matching

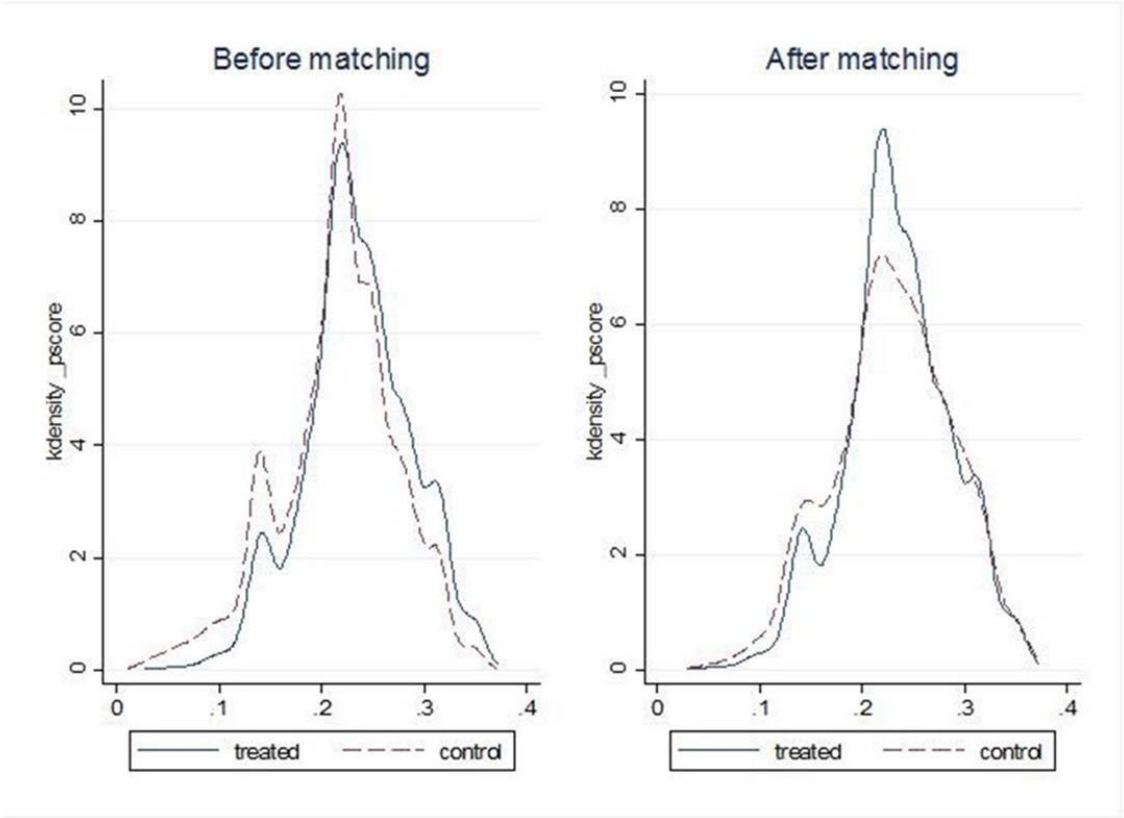


Table 6: Propensity score estimates, Open-ended contract as third contract, ATET results, Fixed term contract as treatment

	ATET	T-stat	S.E.
CTI3			
All workers	-0.2	-18.72	0.0
Aged 18-24	-0.08	-3.21	0.02
Aged 25-29	-0.15	-6.13	0.02
CTI4			
All workers	-0.09	-7.72	0.01
Aged 18-24	-0.003	-0.13	0.028
Aged 25-29	-0.083	-2.82	0.029
CTI6			
All workers	-0.039	-2.87	0.013
Aged 18-24	-0.002	-0.08	0.031
Aged 25-29	-0.005	-0.19	0.031
CTI7			
All workers	-0.038	-2.5	0.015
Aged 18-24	-0.034	-0.99	0.034
Aged 25-29	-0.026	-0.71	0.036
CTI8			
All workers	-0.007	-0.4	0.018
Aged 18-24	0.034	-0.84	0.041

Aged 25-29	-0.029	-0.66	0.044
CTI9			
All workers	-0.031	-1.24	0.025
Aged 18-24	-0.09	-1.57	0.057
Aged 25-29	-0.145	-2.381	0.061
CTI10			
All workers	-0.011	-0.28	0.04
Aged 18-24	-0.041	-0.43	0.095
Aged 25-29	-0.095	-0.99	0.96

The results in Table 6 are much more clear-cut than those for the Temporary Agency workers. Here, whenever the ATET coefficient is significant, it has a negative sign. Moreover, there is only one instance for a positive sign, but it is not statistically significant. Starting from CTI3, we find that having a fixed term contract reduces by 20% the probability of obtaining a permanent job as next contract. For those aged 18- 24, the effect amount to -8% while for those aged 25- 29 amounts to -15%. For the whole sample, the effect remains negative and significant up to CTI7, while becomes insignificant afterwards. For the 18 - 24 group, the effect becomes is insignificant from CTI4 onward. For the 25- 29 group the effect becomes is insignificant from CTI6 onward. Not only there is no sign of stepping stone in this scenario, but rather the trapping effect of the fixed term contract is quite evident.

6. Sensitivity check

A common bane of propensity score analyses is the impossibility to take into account unobserved variables that could affect both the probability of treatment and the outcome probability. If this is the case, the treatment effect may be over or underestimated as hidden factors are actually selecting the treated into or out of a particular outcome. Rosenbaum (2002) proposes a bounding approach of the Mantel-Haenszel statistics to assess the robustness of the model in case there was a hidden variable changing the odds of the treated with respect to the odds if the untreated. Be aware this is not a test for the CIA in itself, but a rather a ”what if” test, showing what would happen to our estimates in case there was a hidden bias affecting to a certain degree the ex-ante probability of being selected into treatment. Specifically, the test tries to assess how large should the bias be in order to make estimates insignificant. We ran the sensitivity check for both temporary agency work and fixed term work, and we find that results for CTD2 are generally more robust to biases with respect to those for SOM2. We report here (Table 8 and 9) the pattern of the test statistics (more about this in Becker and Caliendo, 2007) for the ATET under SOM2 and under CTD2.

Table 7: Mantel-Haenszel statistics (1959) bounds for variable CTI3, treatment SOM2

Gamma	Q*m h+*	Q*m h−*	p*m h+*	p*m h−*
1	6.26779	6.26779	1.80E-10	1.80E-10
1.5	12.6721	-0.00922	0	0.503678
2	17.31	4.47244	0	3.90E-06
2.5	20.9857	7.96774	0	0
4	29.0383	15.4581	0	0
4.5	31.1405	17.3771	0	0
5	33.0556	19.1129	0	0
5.5	34.8188	20.7008	0	0
6	36.4563	22.1666	0	0
6.5	37.9877	23.5301	0	0
7	39.4285	24.8066	0	0
7.5	40.791	26.0081	0	0
8	42.085	27.1442	0	0

The interpretation of the table is as follows. The Gamma parameter tells how much should the bias interfere on the ATET estimate. When Gamma == 1, the study does not suffer any bias. As increasing value of Gamma tells how much would the estimate be affected by a distortion, if it exists. So, the bounds part away from each other as Gamma increases. We find that the study is robust to the presence of unobserved variables, as the only instance we would observe a problem would be in case of negative selection into treatment that increased the odds by 1.5; in that case the effect would be underestimated (in other words, the effect would be even more negative). But in all other instances, as the p-values are well below 0.05 or 0, the model does not suffer from any bias. Repeating the same check for the CTD2 treatment provides in results in Table 8.

Table 8: Mantel-Haenszel statistics (1959) bounds for variable CTI3, treatment CTD

Gamma	Qm h+	Qm h−	pm h+	pm h−
1	20.5666	20.5666	0	0
1.5	21.7224	19.4165	0	0
2	22.8269	18.3222	0	0
2.5	23.8857	17.2792	0	0
4	24.9028	16.2829	0	0
4.5	25.8814	15.3294	0	0
5	26.8246	14.4151	0	0
5.5	27.7351	13.5368	0	0
6	28.6153	12.6918	0	0
6.5	29.4672	11.8777	0	0
7	30.2929	11.0922	0	0
7.5	20.5666	20.5666	0	0
8	21.7224	19.4165	0	0

The results in Table 8 clearly prove that even if there was a hidden variable behind the selection in to treatment of individuals, it would not have any impact of the ATET estimation, as all p values are 0. Or, it could also be that no hidden variable really exists or if it exists, affects both treated and untreated the same way.

7. Conclusion

The abundant empirical literature on the stepping stone hypothesis in the labour market presents up to now mixed results. While some authors do find positive evidence for the stepping stone hypothesis, as various temporary contracts seem to be working as jumping boards to the world of open-ended contracts, others do not find any evidence, as sometime results are uncertain or negative. The results are likely to be highly sensitive to the type of data used (observation or survey), to the methodologies and to the counterfactual adopted. In most cases where the counterfactual status adopted is unemployment or being out of the labour force, some positive evidence emerges. When the counterfactual statuses are alternative contractual forms, as open-ended contracts are the natural predictors for subsequent open-ended contracts, the negative evidence is found. We use the same source of data, the same demographic and economic characteristics from a unique dataset of new registered labour contracts over a period of 7 years. We modelled two contractual arrangements to assess the presence of the stepping stone effect using 1) temporary agency workers and 2) fixed- term contract workers against a counterfactual of a set of other possible contractual arrangements. We measured the effect with respect to the immediate subsequent contracts and to contracts more distant in time. We could not find any evidence for a stepping stone effect when the treated group has been granted a fixed-term contract, while some very light evidence emerges through time when the treatment is represented by temporary agency contracts. The interpretations follows from the theory, as certain characteristics of the "trapped" workers with fixed term contracts have low control over their job performance. This situation has been reinforced since the economic downturn
and widen the existing large gap in the Italian dual labour market with very little alternatives out of this

very popular contractual arrangement, that represent for most workers a situation they can hardly escape[9]. However it must be said that the second observational predictor for an open-ended contract (after the open-ended contract itself) is the fixed-term contract. Since workers have low job control, future research
is needed to focus on workers with these characteristics and jobs to understand which other factors create the temporariness and 'trap' effect of the job.

The dynamics of temporary agency workers look completely different. In this case, it can be said that the cumulated effects of learning and experience in time might show some positive stepping stone effect. Our results are in line with what found in the literature using observational, administrative data using as counterfactual other types of agreements. The sensitivity check for the CIA condition supports the model we adopted. From the policy point of view, we could infer that firms adopted more and more fixed-term contracts to face swings in market demand or to screen the needed labour force, ending up with creating a sort of perpetual loop. Firms took advantage of this flexible contractual agreements that grants fewer rights and a lower security level for workers, in contrast to permanent workers, who enjoyed a more stable and safe working condition.

7

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[9]According to Cabrales, Dolado and Mora (2015) the different redistributive effects and the large gap in the on-the-job training between transitory and permanent workers is due to the segmented and dual structure of the labour markets as the main determinant of the low job stability.

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ANNEX 1 – Empirical Strategy: Temporary Agency Work

Hypothesis: the Temporary Agency Work contracts increases (reduces) the probability of finding an open- ended job as next job, with respect to any other form of dependent labour contract.

In order to prepare our dataset, the empirical strategy followed these steps:

- We define our treatment, $D = 1$, as "having a temporary agency work assignment as the second contract observed in the 2008-2015 time spam". We focus on the second contract observed, instead than on the first, as we lack information on workers before their first contract in 2008. Therefore, so to rule out the possibility that the second contract is a mere renewal of the previous contract and control, at least partially, for the self-selection into a temporary agency job, we restrict our analysis to those workers who appear for the first time in 2008, but have a temporary agency contract for the first time as the second contract[1] .
- We define our outcome Y , as the type of the third contract observed in workers' life, no matter how long it takes to transit from the second job to the third, where $Y1$ = "having permanent contract as third contract when the second contract was a temporary agency work assignment" and $Y0$ = "having a contract different from a permanent contract as third contract when the second contract was a temporary agency work assignment".
- We drop from our 631,882 workers those who had a permanent job without an expiry date as their first contract. We remained with 572,224 workers.
- We drop from our 572,224 workers those who had a temporary agency work as their first contract observed. We remain with 526,533 workers.
- For their very specific nature of extreme, unstable or sector specific jobs, we exclude from our benchmark the workers with a job–on-call and domestic workers (mostly female, middle-aged and foreign) as their second contract, since the likelihood of these workers to have a temporary agency or other more regular dependent jobs is very low. They would not make a significant control group. We remain with 487,930 workers.
- We drop workers with part-time working arrangements as their second contract. The reasons for this are manifold. First, many of them would be deleted anyway in a following step, where we require non-overlapping contracts to properly insulate the stepping stone effect. Second, the database does not allow for checking how many hours weekly or monthly are actually worked. Therefore, we could compute an average 50% working hours with respect to full time workers, we would probably include some distortions in the dynamics of the contractual agreements, distortion that would operate also in the comparison between treated group and control group. Third, the distribution of part-time and full time workers differ substantially among professional categories. We remain with 409,360 workers.
- We drop overlapping contracts (some of them were already deleted in the previous step) so to focus on the transition process from one contract to the other. This is a negligible number of workers. We remain with 409,296 workers.
- An important chapter is the transformation issue. Some workers undergo a transformation in their

contractual agreement while still on the job, with no interruption of any sort. The employer has to communicate the transformation, and when the contract expires, the database registers only the last features of the contract held. Therefore, the transformation, to a first extent, might concern the legal type of contract, working hours, professional category, and so on. With no other investigation, we cannot tell exactly what happened to transformed contract. Since we know that very often transformations are from fixed-term to permanent working positions, we will devote a special section on this topic later on. For a start, we drop those workers who underwent a transformation during their second contract. This results in a substantial reduction in our population, as we remain with 249,771 workers. - Another strong limitation we introduce is minimum contract length. We want to rule out sporadic workers and very short working spell from our analysis. If the stepping stone has to take place, or even if it has not, workers should have the time to prove their capacity and commitment and offer enough possibilities to employers to monitor and screen them. Moreover, building any significant new capacity or acquire training in very short contracts is difficult, so as building informal networks. Also, becoming unproductive or lose motivation probably take some time. We require that all the second contracts last at least 120 days (four months). This is a strong limitation9 that leads to work with 147101 workers.

- We drop unknown second contractual agreements and we remain with 146,621 workers.
- For the sake of comparability of the control group, we drop those workers who have a permanent job without an expiry date as their second contract. Their self-selection into the position does not make them a valid counterfactual for temporary agency workers. We remain with 125,842 workers.

ANNEX 1 – Empirical Strategy: Fixed term contracts

Hypothesis: Fixed-term contracts increases (reduces) the probability of finding an open-ended job as next job, with respect to any other form of dependent labour contract.

In order to prepare our dataset, the empirical strategy followed these steps:

- We define our treatment, $D = 1$, as "having a fixed-term as the second contract observed in the 2008-2015 time spam". To rule out the possibility that the second contract is a mere renewal of the previous contract and control, at least partially, for the self-selection into a fixed-term job, we restrict our analysis to those workers who appear for the first time in 2008, but have a fixed- term job for the first time as the second contract[1]
- We define our outcome Y , as the type of the third contract observed in workers' life, no matter how long it takes to transit from the second job to the third, where $Y1$ = "having permanent contract as third contract when the second contract was a fixed-term job" and $Y0$ = "having a contract different from a permanent contract as third contract when the second contract was a fixed-term job".
- We drop from our 631,882 workers those who had a permanent job without an expiry date as their first contract. We remained with 572,224 workers.
- We drop from our 572,224 workers those who had a fixed-term job as their first contract observed. We remain with 304,055 workers.
- As before, for their very specific nature of extreme, unstable or sector specific jobs, we exclude from our benchmark the workers with a job–on-call and domestic workers (mostly female, middle- aged and foreign) as their second contract. We remain with 278,066 workers.
- As before, we drop workers with part-time working arrangements as their second contract. We remain with 236,042 workers.
- We drop overlapping contracts so to focus on the transition process from one contract to the other. We remain with 235,997 workers.

- As before, we get rid of transformed contracts. We remain with 141,704 workers.
- As before, we set a minimum contract length. We remain with 89,199 workers.
- We drop unknown second contractual agreements and we remain with 88,857 workers.
- For the sake of comparability of the control group, we drop those workers who have a permanent job without an expiry date as their second contract. We remain with 70,816 workers.
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[8] We ran the analysis also on the first contract observed to check for different results, but the results were robust