

Heterogeneous paths to stability

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Abstract

In this paper we investigate how specific features of short-term contracts may affect the probability of conversion into permanent contracts. To reach this objective, we study the effect of the 2014 deregulation of the short-term contract in Italy and the 2015 reduction of labour and firing costs for permanent workers. We design a search and matching model which investigates the dynamics of short-term and permanent contract choices in dual economies, in response to an institutional shock. The model predicts an increase in the utilization of both short-term contracts and permanent contracts, with a delayed increase in the conversion rate. Empirically, using data on the universe of Italian workers provided by the Italian Social Security Institute, we estimate a difference in difference model to test for the model predictions. We find interesting heterogeneous effects by categories of workers.

Keywords: .

JEL Classification: .

1 Introduction

2 Institutional background

The Italian labour market is heavily segmented in permanent and fixed-term workers. The dualism arose at the end of the nineties when the government progressively introduced different types of fixed-term contracts to increase flexibility in the use of labour, without changing the features of the permanent contracts. During the 2000s the share of fixed-term workers increased rapidly to approximately 13 per cent. More than 60 per cent of new hires were fixed-term job contracts, used not only to face labour demand uncertainty, but also as a cheap screening device before hiring workers under a permanent contract. Two major labour reforms have been implemented in the last few years in Italy: in 2014 with the so-called "Decreto Poletti" and in 2015 the so-called "Jobs Act". The former further liberalized the utilization of short-term contracts by removing for all short-term contracts, independently on their length, the obligation for employers to declare the precise reason why they would hire a worker with a short-term contract rather than with a permanent one. Even though this might seem like a marginal change, it is quite relevant, as if not reported correctly an

employee can sue the employer and eventually obtain from the labour court the conversion of the short-term contract into a permanent one. Moreover, the reform increased the possibility of extension of the contract duration from one to five times, within the maximum duration of three years within the same company.

The "Jobs Act" approved in 2015 changed the permanent contract significantly. The new labour contract for all new open-ended jobs is based on graded security, with severance payments steadily increasing with tenure. This severance payment is flat at 4 months for the first two years, and then increasing with tenure up to a maximum of 24 months wages at a 12 years tenure. The Jobs Act also introduced a new form of out-of-court procedure, according to which the employer can pay the worker an indemnity equal to 2 monthly wages in the first two years of tenure and then an additional 1 monthly wage per year of service, with a maximum amount of 18 monthly after 18 years of service. The acceptance of this transaction prevents any further dispute by the worker, that is, appealing to courts for a dismissal to be unfair or not. Both parties have a strong incentive to settle the dispute through this procedure, since the sum paid is not subject to social contributions or taxation. The new graded security contract also replaced the worker reinstatement with a monetary compensation for economic unfair dismissals. The new dismissal rules applied to all new hires on an open ended basis, and do not involve workers continuing on permanent contracts in firms with more than 15 employees, who continued to be protected by the reinstatement clause. The 2015 Budget Law also introduced a sizable hiring subsidy for new hires in open ended contracts. With this intervention, employers were exempted from paying social security contributions up to a 8,060 € cap per year and worker for the three years following the hiring. In order to discourage an opportunistic behaviour of employers, the hiring subsidy excluded workers with an open ended contract in the previous six months (and with an open ended contract with the same firm in the 3 months before Dec 2014). The hiring subsidy applies uniformly in larger and smaller firms and there is no firm size threshold associated to this policy (Boeri and Garibaldi, 2018).

The two policy measures undertaken in 2015 and analyzed in this paper almost overlap in terms of timing. From January 2015 for the incentive, from 7 March 2015 for the new firing costs. Moreover, there are some differences in the population targeted by the two policies that can be used to separately identify their effects. Incentives are paid to firms of any size, while the Jobs Act applies to firms with at least 15 employees; the incentives apply only to workers without permanent contracts in the previous 6 months, while the previous status of the worker is irrelevant for the application of the Jobs Act. It has to be noted that the fixed amount of the hiring incentive for all new permanent contracts signed in 2015 leaves a lot of room for firms's "strategic" behavior, since a firm may obtain the same amount for permanent contracts signed in both January 2015 and December 2015 (including conversions from a temporary to a permanent contract).

3 Literature

Using a unique dataset covering the universe of private firms having at least once 10 to 20 employees in the period 2013-16, Boeri and Garibaldi (2018) find evidence of a causal increase in open-ended hirings by firms with more than 15 employees relative to smaller

firms, as a consequence of the Italian Jobs Act reform. They also observe an increase in the transformation from fixed term to open ended contracts as large as 100 percent.

Using microdata on hiring and firing for one Italian region, Veneto, Sestito and Viviano (2018) exploit differences in the design of the two policies, i.e., the Jobs Act reform and the reduction of labour costs, to separately identify the effects of new firing costs on firm hiring. They find that around 8% of gross permanent hires occurred because of the reduction of firing costs (in addition to the positive and large effect of the hiring subsidies). The reform of firing costs contributed also to increase the monthly rate of conversion of fixed-term jobs into permanent positions. They also find that the new firing rules made firms slightly less reluctant to offer permanent job positions to yet untested workers.

Finally, Bovini et al. (2018) find that gross permanent hires and conversions of fixed-term positions have temporarily, but significantly, benefited from the 2015-2016 hiring subsidies across all types of firms and, more smoothly, from the new regulation of dismissals introduced by the 2015 Jobs Act for medium-large firms. This latter result is clear in 2017, in the absence of subsidies to permanent hiring. Fixed-term employment has increased, likely favored by the 2014 Poletti Decree, more strongly so when permanent hiring subsidies were lifted or weakened and among smaller firms.

4 The Model

We develop a continuous time search and matching model. The economy is populated by a continuum of workers and a continuum of firms. Workers are homogenous and the mass of workers is normalized to unity. All agents are risk neutral and discount the future at the interest rate r . Firms post vacancies, which are either permanent (P) or temporary (T) in nature. They differ for the duration of the contract, open-ended versus limited length, respectively. We assume that unemployed workers and unfilled vacancies are brought together via a stochastic matching technology $m(u; v)$; where u and v denote respectively the number of unemployed workers and vacancies. The matching function exhibits standard properties: it is twice continuously differentiable, increasing in its arguments, linearly homogeneous and satisfies the Inada conditions. Using the property of constant returns to scale, we can write the flow rate of a match for a worker as $m(u, v)/u = m(\theta)$ and the flow rate of a match for a vacancy as $m(u, v)/v = q(\theta)$, where $\theta \equiv v/u$ is an indicator of the labour market tightness. Also, the above mentioned assumptions on the matching function imply that $m'(\theta) > 0$ and $q'(\theta) < 0$.

The instant a vacancy and a worker make contact, they bargain over the division of the surplus. We assume that wages are determined by an asymmetric Nash bargaining, where the worker has bargaining power β . After an agreement has been reached, production commences immediately. Moreover, we assume that both permanent and temporary matches dissolve at the rate s . Following a separation, the worker and the vacancy enter the market and search for new partners. The rest of this section offers a detailed description of the model.

4.1 Workers

Each worker is either unemployed or employed as an employee. Workers are homogeneous with productivity y . The unemployed accept or reject job offers as soon as they arrive. We assume that both permanent and temporary employees are dismissed and thus become unemployed at rate s . If hired on a temporary contract, a productivity shock can hit the match and workers can be upgraded to a permanent contract at rate τ , if the withdrawn productivity level is high enough. Alternatively, their contract get extended and they hold their position. Any unemployed worker receives utility flow z per instant (z can be interpreted as an unemployment benefit). Given the above assumptions, the expected discounted lifetime income when an individual is unemployed, W^U , can be expressed as the solution to the following Bellman's equations:

$$rW^U = z + \theta q(\theta) [\phi W^P(y) + (1 - \phi)W^T(y) - W^U], \quad (1)$$

where $\theta q(\theta)$ is the probability to find a permanent versus temporary job, respectively and ϕ is the share of permanent jobs in the economy.

Similarly, the expected lifetime income of an employee who accept a job offer solves:

$$rW^P(y) = w^P(y) + s [W^U - W^P(y)], \quad (2)$$

$$rW^T(y) = w^T(y) + s [W^U - W^T(y)] + \tau \int_0^{+\infty} [\max\{W^P(y'), W^T(y')\} - W^T(y)] dF(y'), \quad (3)$$

where s is the termination rate, while τ is the rate at which a productivity shock hits the match.

4.2 Firms

Firms post vacancies, which are for either a permanent or a temporary job. Each firm posts at most one vacancy. A vacant firm bears a recruitment cost c and it fills a vacancy at rate $q(\theta)$.

$$rV^P = -c + q(\theta) [J^P(y) - V^P], \quad (4)$$

$$rV^T = -c + q(\theta) [J^T(y) - V^T], \quad (5)$$

$$rJ^P(y) = y - w^P + s [V^P - J^P(y)], \quad (6)$$

$$rJ^T(y) = y - w^T + s [V^T - J^T(y)] + \tau \left[\int_0^{+\infty} \max\{J^P(y'), J^T(y') - c^e\} dF(y') - J^T(y) \right]. \quad (7)$$

If the firm hires a temporary worker, the match is hit by a productivity shock at rate τ and at that point the firm has to decide whether to upgrade the worker to a permanent position or to extend the temporary contract. This decision depends on the new productivity

level of the worker. If the firm decides to extend the temporary contract, it will have to pay an extension cost c^e . The cost includes the administrative expense the firm has to bear in order to justify the reason for the extension. Moreover, and most importantly for this work, it is a proxy for the possibility for the firms to extend the contract. If there is no possibility of extension, the cost would be infinite, if there are unlimited extensions, the cost would be zero.

4.3 Steady-State Composition of the Labour Force

Recall that the mass of workers is equal to unity. Thus, the total mass of workers in the economy is $U + E^P + E^T = 1$. By equating the flows out of and into unemployment and both permanent and temporary employment, we can find the steady-state employment and unemployment:

$$U = \frac{s}{s + \theta q(\theta)}, \quad (8)$$

$$E^T = \frac{\theta q(\theta)[(1 - \phi)s + \tau(1 - F(\hat{y}))]}{(s + \theta q(\theta))(s + \tau(1 - F(\hat{y}))),} \quad (9)$$

$$E^P = \frac{\theta q(\theta)[\phi s + \tau(1 - F(\hat{y}))]}{(s + \theta q(\theta))(s + \tau(1 - F(\hat{y}))).} \quad (10)$$

4.4 Nash bargaining

Since all workers and firms are risk neutral, Nash bargaining implies that the wage rate w^j , where $j \in \{P, T\}$ must be such that:

$$\beta(J^P - V^P) = (1 - \beta)(W^P - W^U), \quad (11)$$

$$\beta(J^T - V^T) = (1 - \beta)(W^T - W^U), \quad (12)$$

where $(1 - \beta)$ is the bargaining power of the firms and β is the bargaining power of the workers.

4.5 Steady-state equilibrium

As there is free entry and exit on the firm side, an additional vacancy should make expected net profit equal to zero, that is, $V^P = V^T = 0$.

A steady-state equilibrium is a set $\{\theta, w^j, U\}$ where $j \in \{P, T\}$ such that

1. The free entry condition $V^P = V^T = 0$ is satisfied.
2. The Nash bargaining optimality conditions 11-12 hold.
3. The numbers of employed and unemployed workers as well as of filled and unfilled vacancies of each origin remain constant.

The job creation conditions are obtained from Equations 4-7 and read as:

$$\frac{c^P}{q(\theta)} = \frac{y - w^P}{r + s} \quad (13)$$

$$\frac{c^T}{q(\theta)} = \frac{y - w^T + \tau \left(\int_{\hat{y}}^{+\infty} \frac{y - w^P}{r + s}, dF(y') - F(\hat{y})c^e \right)}{r + s + \tau(1 - F(\hat{y}))} \quad (14)$$

The wage setting conditions are derived using equations 2-3, 6-7 and 11-12:

$$w^P = \beta y + (1 - \beta)rW^U, \quad (15)$$

$$w^T = \beta y - \beta\tau F(\hat{y})c^e + (1 - \beta)rW^U, \quad (16)$$

where

$$W^u = \frac{1}{(r + \theta q(\theta))} \left[z + \frac{\beta}{1 - \beta} c\theta \right]. \quad (17)$$

Hence, W^u is continuous and strictly increasing in θ , but independent of ϕ . Intuitively, as the tightness of the labor market, θ , increases, workers find jobs faster; thus the value of unemployment is higher.

We can compute the threshold \hat{y} by which the firm is indifferent whether to extend the temporary contract at termination by paying an extension cost or whether to upgrade it to a permanent contract, i.e., $J^P(\hat{y}) = J^T(\hat{y}) - c^e$.

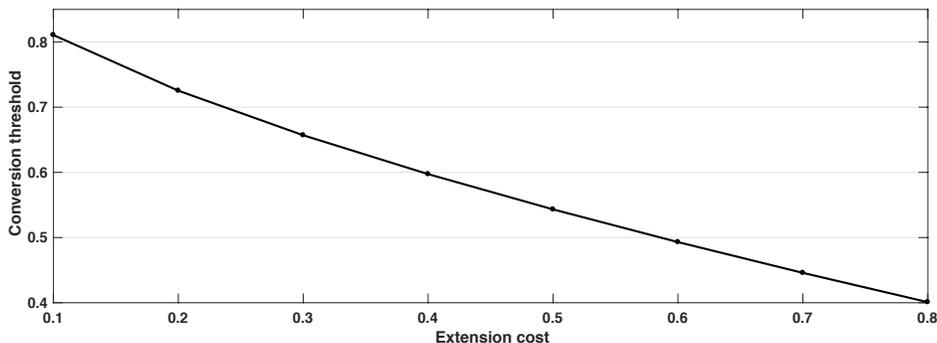
$$\frac{\hat{y} - w^P}{r + s} = \frac{\hat{y} - w^T + \tau \left[\int_{\hat{y}}^{+\infty} \frac{y - w^P}{r + s}, dF(y') \right] - c^e(\tau F(\hat{y}))}{r + s + \tau(1 - F(\hat{y}))} - c^e. \quad (18)$$

5 A simple calibration

By increasing the number of possible extensions to the duration of the temporary contract, we expect the probability of conversion of the short-term contract into an open-ended one to be lower. To assess the validity of our conjecture, we calibrate the model and perturb the parameter associated with the cost of extending a short-term contract. This calibration is not meant to match any specific economy, but serves the simple purpose of showing the impact of the reduction of the short-term contract extension cost on the conversion probability. Figure 1 shows the result of this experiment. As expected, whenever the cost of extending the short-term contract increases, the threshold which defines the conversion of temporary contracts into permanent ones decreases, leading to more transformations. This is quite intuitive as firms prefer to convert short-term contract into permanent ones whenever is more expensive to extend them.

Parameter	Description	Value
β	Bargaining power	0.5
r	Interest rate	0.01
τ	Rate at which the productivity shock hits the match	0.5
s	Rate at which the job destruction shock hits the match	0.1
c	Cost of extending the short-term contract	0.5

Figure 1. Effect of extension cost on conversion threshold.



6 Data

In this paper we use administrative microdata from the *Comunicazioni Obbligatorie*. In Italy the employers are required to electronically file all occurrences concerning a job position to the Regional agencies in charge of active labour market policies (and to the Italian social security institute, INPS). Microdata archives, which cover only employees in the private sector and part of the public sector, are collected and organized by each Italian region. The database collects information on the opening, termination, and extension or conversion of contracts. Our dataset contains information regarding all events (hiring, firing, conversion and fixed-term contract extended duration) that occurred in Italy between January 2014 and December 2016. For each event recorded in our dataset it is possible to identify both the firm and the worker involved. On top of the relevant anonymized identifiers (firm and worker), we know the firm's size (by size class) and sector of activity and the worker's gender, birth-date, education level and nationality. For each event we know the type of job contract, i.e. whether permanent or fixed-term. The latter group includes: (i) short-term contracts, (ii) agency workers, (iii) apprentices,¹¹ (iv) consultants (so-called *parasubordinati*, i.e. a sort of consultants employed on a temporary basis) and (v) internships (so called *tirocini-formativi*).

We focus on workers hired for the first time in 2014 on a short-term contract and we follow them over time until December 2016. From our dataset we exclude workers hired

in the entertainment sector as they tend to be hired daily. After this selection our dataset includes around 750 million occurrences involving ?? workers and almost ?? firms.

In this paper we use the individual- level panel dimension, recording the working status of individuals week by week. Thus, for each individual we know whether he/she is or is not working in a given week, on which type of contract, the size of the firm and whether the worker's contract has been upgraded to a permanent position, extended in time or terminated.

7 Empirical Strategy

We use a difference in differences estimation strategy. We define the control group as those workers who entered the labour market for the first time in 2014 and were hired on a short-term contract, just before the Poletti decree was passed. We define as treated those workers who entered the labour market for the first time in 2014 and were hired on a short-term contract, just after the Poletti decree was passed. We follow these two categories of workers over time and specifically, we observe in each week from the starting of their contract whether they were upgraded or not to a permanent position. Specifically, we estimate the following model:

$$Pr(T_i = 1) = \alpha + \beta(treated_i) + \sum_{j=1}^{n_i} \gamma_j(week_j) + \sum_{j=1}^{n_i} \delta_j(week_j)X(treated) + \epsilon_i \quad (19)$$

where *treated* is a dummy variable which takes value one if the worker is in the treated group and zero otherwise. *Week_j* is a set of dummies which identify the weeks starting from 2014 until the end of 2016. We are interested in the coefficients δ_j of the interactions between the dummy variable *treated* and the *weeks*.

8 Results

9 Appendix

$$\frac{(1 - \beta)(\hat{y} - rW^U)}{r + s} + c^e = \quad (20)$$

$$\frac{(1 - \beta)(\hat{y} - rW^U) + \beta\tau F(\hat{y})c^e + \tau \left[\int_{\hat{y}}^{+\infty} \frac{(1-\beta)(y-rW^U)}{r+s}, dF(y') \right] - c^e(\tau F(\hat{y}))}{r + s + \tau(1 - F(\hat{y}))}. \quad (21)$$

$$\begin{aligned} (1 - \beta)\tau(1 - F(\hat{y}))\hat{y} &= (1 - \beta)\tau \left[\int_{\hat{y}}^{+\infty} (y - rW^U), dF(y') \right] \\ &- [(r + s)(r + s + \tau(1 - F(\hat{y})) + (1 - \beta)(r + s)\tau F(\hat{y}))c^e \\ &+ (1 - \beta)\tau(1 - F(\hat{y}))rW^U. \end{aligned} \quad (22)$$

If we assume F is uniformly distributed in the range (0, 1), we get:

$$\begin{aligned}
(1 - \beta)\tau(1 - \hat{y})\hat{y} &= (1 - \beta)\tau \left[(1/2 - \hat{y}^2/2) - rW^U(1 - \hat{y}) \right] \\
&- [(r + s)(r + s + \tau(1 - \hat{y})) + (1 - \beta)(r + s)\tau\hat{y}]c^e \\
&+ (1 - \beta)\tau(1 - \hat{y})rW^U.
\end{aligned} \tag{23}$$

$$\begin{aligned}
&- \frac{(1 - \beta)\tau}{2}\hat{y}^2 + [(1 - \beta)\tau - \beta(r + s)\tau c^e]\hat{y} \\
&+ [(r + s)(r + s + \tau)c^e - \frac{(1 - \beta)\tau}{2}] = 0.
\end{aligned}$$

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