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CROSSING THE THRESHOLD: EMPLOYMENT REGULATION, FIRM BEHAVIOUR, AND LABOUR MARKET FLEXIBILITY IN ITALY

by Luca Brugnara*, Silvia Camussi*, Graziella Mendicino** and Francesca Modena***

Abstract

This paper examines how employment protection legislation and firing costs affect firm size growth and workforce composition in Italy (as a ratio of temporary to permanent employment), with a particular focus on recent labour market reforms. The analysis is based on administrative firm-level data from the Italian private sector, with a specific focus on firm outcomes above the 15-employee threshold, where stricter employment regulations apply. Using a linear probability model, we find that firms near this threshold are less likely to grow in terms of employee numbers. Furthermore, the discontinuity in employment protection influences the composition of the workforce, leading to a higher incidence of temporary contracts above the threshold.
We apply a difference-in-discontinuities approach to examine the heterogeneity in the threshold effect during a period of labour market reforms. Our results suggest that recent reforms have had negligible effects on the discontinuity in firms' employment growth. As for the use of flexible contracts, we observe a mitigation of the threshold effect after the regulatory changes.

JEL Classification: D22, J21, J63, K31, L11.

Keywords: firing costs, labour market reforms, employment policies, firm size growth.

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1. Introduction[1]

Studying the effects of employment protection (EP), the set of rules that govern hiring and firing, is crucial to understand how such regulations shape the growth and performance of firms. Although a vast theoretical and empirical literature has examined this issue (Lazear, 1990; Grubb and Wells, 1993; Nickell and Layard, 1999; Oecd, 1999; Autor, 2003; Botero et al., 2004; Freeman, 2005; Bartelsman et al., 2009; Haltiwanger et al., 2014), the evidence remains mixed: the effects of EP are neither unequivocally negative nor fully predictable.

On one side, higher protection promotes job stability and this may encourage commitment and investment in firm-specific human capital with positive effects on firms' performances (Soskice, 1997; Pierre and Scarpetta, 2004). On the other side, EP could hinder firms' growth and efficient labour market adjustments: stringent dismissal protections tend to reduce job separation but also discourage job creation, limiting firms' ability to adjust their workforce to economic changes (Bentolila and Bertola, 1990; Bertola, 1990).

Italy represents a particularly compelling case for studying these dynamics. Indeed, the Italian regulatory system is characterized by stringent and size-dependent labour market regulation for permanent contracts, with firms employing more than 15 workers subject to stricter rules regarding unfair dismissals compared to smaller firms. This regulatory distinction creates notable discontinuities in firing costs at the 15-employee threshold. The potential impact of the EP on the growth of firms is a crucial issue in Italy, which is characterized by one of the highest proportions of small firms among industrialized economies (Bugamelli et al., 2018). This setting may affect firm employment growth in two ways.

Firstly, it may prevent optimal scaling: firms may strategically limit their size to avoid reaching thresholds where stricter employment regulations apply. Such institutional arrangements may be a factor constraining firm growth, fostering the persistence of smaller and less productive enterprises.[2] Several empirical evidence supports this hypothesis (see, for example, Garicano et al. (2016) for France and Schivardi and Torrini (2008) for Italy). Additionally, EP legislation can influence firm size due to its impact on the efficient allocation of labour from less productive units to more productive ones. In the presence of high costs for hiring or firing, firms face greater rigidity in adjusting their workforce to changes in market conditions or productivity: productive firms may struggle to expand optimally, while less productive ones may retain excess workers. From an empirical point of view, several studies have found consistent evidence for a negative effect of EP on allocative efficiency (Gnocato et al., 2020; Andrews and Cingano, 2014; Boeri and Garibaldi, 2009; González and Miles-Touya, 2012; Hopenhayn and Rogerson, 1993; Petrin and Sivadasan, 2013).

Another characteristic of the Italian labour market that makes the analysis of EP particularly compelling is its dual structure. In the decade leading up to the 2008 Global Financial Crisis, many reforms have been adopted, as well as in other European countries, with the aim of improving the flexibility of the labour market and easing EP legislation for workers with temporary contracts (Boeri, 2011). These reforms result in "flexibility at the margins", in which restrictions on temporary contracts are relaxed, while stringent regulations on permanent employment remain unchanged. This asymmetric liberalization facilitated the use of fixed-term contracts, allowing for

[1]We would like to thank Giuseppe Albanese, Michele Cascarano, Emanuele Ciani, Roberto Torrini, two anonymous referees and all the participants to the SIE conference. The views expressed in the paper are those of the authors and do not necessarily reflect those of the Bank of Italy.

[2]The positive correlation between productivity and size is well documented (Bugamelli et al., 2018)

easier termination and non-renewal.

Such reforms are likely to influence workforce composition and induce firms to substitute temporary workers for permanent ones, with possible negative effects on workers' investment in human capital (Hopenhayn and Rogerson, 1993).[3]

Addressing the challenges posed by this dualism in the labour market became a key policy priority in the early 2010s. Consequently, the principal labour market reforms of the period — specifically the Fornero reform of 2012 and the Jobs Act of 2015 — sought to address two key challenges: reducing uncertainty over dismissal costs for employees on open-ended contracts in larger firms, and mitigating the precarious nature of temporary employment. The Fornero reform represented an initial attempt to lower firing costs by limiting reinstatement rights to cases of discriminatory or manifestly unfounded dismissals, while introducing monetary compensation in all other cases. Nonetheless, compensation levels remained subject to judicial discretion, perpetuating legal uncertainty for employers. The Jobs Act built on this framework by further streamlining dismissal procedures, introducing a standardized severance scheme explicitly linked to tenure. Although several studies have examined the effects of these interventions in terms of open-ended hiring and conversion from fixed-term to open-ended contracts (Boeri and Garibaldi, 2019; Cirillo and Guarascio, 2017; Pigini and Staffolani, 2022), evidence remains limited regarding how these reforms have influenced the threshold effect on firms' likelihood of employment growth and their workforce structure.

This paper investigates the impact of Italian EP legislation on firm-level employment growth and the composition of the workforce between temporary and permanent contracts. It also explores how recent labour market reforms have modified these effects. Drawing on administrative data covering all Italian firms from 2005 to 2019, we exploit the 15-employee threshold discontinuity to estimate the effect of changes in firing costs on these two outcomes. The empirical strategy relies on both a linear probability model - following the approach of (Schivardi and Torrini, 2008; Hijzen et al., 2017) - and a difference-in-discontinuities design which allows us to examine the heterogeneity of the threshold effect over time.

Consistent with previous studies, the analysis shows that the smooth relation between size and growth probability is slightly disturbed in proximity of the thresholds at which EP applies differentially. In particular, for companies with 15 employees the likelihood of firm growth declines by 2.6 percentage points reaching 31.7%. The labour market reforms introduced with the Fornero Law and then with the Jobs Act had a limited effect on firm growth at the regulatory threshold. Estimates obtained from a difference-in-discontinuities model do not reveal statistically significant effects overall. Focusing on the Jobs Act specifically, the estimated coefficient capturing the change in the discontinuity after the reform—relative to the pre-reform period—is positive, suggesting a modest attenuation of the threshold effect. However, this estimate is not statistically significant and should be interpreted with caution. One possible interpretation for the absence of a statistically significant impact is that, although the reforms reduced firing costs for small firms, they were not enough to overcome other barriers that hinder growth around the threshold. These barriers may include administrative burdens, limitations in managerial capacity, or lingering regulations tied to firm size, all of which may continue to discourage expansion beyond 15 employees despite the reforms.

Regarding the workforce composition, we find that firms facing more stringent EP make a

[3]Indeed, evidence suggests that temporary workers tend to reduce their work effort when the likelihood of transitioning to a permanent contract is low (Dolado and Stucchi, 2008; Engellandt and Riphahn, 2005).

greater use of workers on temporary contracts: at the threshold the share of fixed-term contracts increases by 0.7 percentage point from a level of 11.6% among firms with 15 employees. Recent reforms have helped narrow the gap in the use of temporary contracts around the 15-employee cutoff. This conclusion is corroborated by the negative coefficient estimated through the difference-in-discontinuities approach, which indicates a small but measurable reduction in the discontinuity at the threshold.

The remainder of the paper is structured as follows. Section 2 provides an overview of the employment protection in Italy. Section 3 describes the data and presents descriptive statistics. Section 4 outlines the empirical strategy and discusses identification issues. Section 5 present the main findings regarding the growth of firms, including heterogeneity in the effects and robustness checks. Section 6 presents the evidence on the use of fixed-term contracts. Section 7 concludes.

2. The employment protection legislation in Italy

Historically, Article 18 of the Italian Labour Code imposed substantial dismissal costs on firms with more than 15 employees, granting reinstatement and back pay in cases of unjustified dismissal. The unpredictability of judicial rulings and procedural delays further amplified these costs. In contrast, smaller firms faced less stringent rules, generating a sharp regulatory discontinuity at the 15-employee threshold (see Appendix 11 for a more detailed overview of the EP legislation in Italy).

The paper focuses specifically on the costs of dismissals beyond the 15-employee threshold. However, there are additional obligations that impose other administrative burdens on employers at the same threshold, which can potentially discourage firms from expanding their workforce beyond 15 employees (see sub-section 2.1.) Our empirical strategy enables us to disentangle the specific impact of firing costs from the broader set of regulatory obligations associated with crossing the 15-employee threshold.

Reforms during the early 2000s introduced new fixed-term contracts, characterized by a low EP, which created a significant divide between workers with permanent contracts, who enjoyed strong protections, and those on temporary or atypical contracts, who faced limited rights and greater insecurity. Over the past decade, Italy implemented several labour market reforms aimed at reducing employment protection (EP) asymmetries and labour market duality. The Fornero reform (2012) marked a first attempt to reduce firing costs for larger firms by limiting reinstatement rights to cases of discriminatory or clearly unjustified dismissals and introducing monetary compensation in other instances. However, compensation levels for larger firms remained subject to judicial discretion, contributing to continued uncertainty. The Jobs Act (2015) further streamlined dismissal procedures by introducing a standardized compensation scheme linked to tenure, applying only to new hires under permanent contracts. These reforms contributed to a measurable decline in the OECD EP indicator for permanent contracts (Figure 1).

More recently, reinstatement protections have come under scrutiny. In ruling n. 128/2024, the Constitutional Court mandated reinstatement for dismissals based on unfounded economic reasons, without considering the possibility of worker redeployment ("repêchage"). In ruling n. 129/2024, the Court clarified that reinstatement also applies when dismissals violate collective agreements that prescribe only corrective sanctions, emphasizing proportionality.

On the temporary employment side, the Fornero reform simultaneously introduced stricter constraints on fixed-term contracts to promote employment stability. This rigidity, however, was partially reversed by the Poletti Decree (2014), which liberalized temporary hiring by removing the causality requirement and increasing renewal flexibility. The Dignity Decree (2018) later

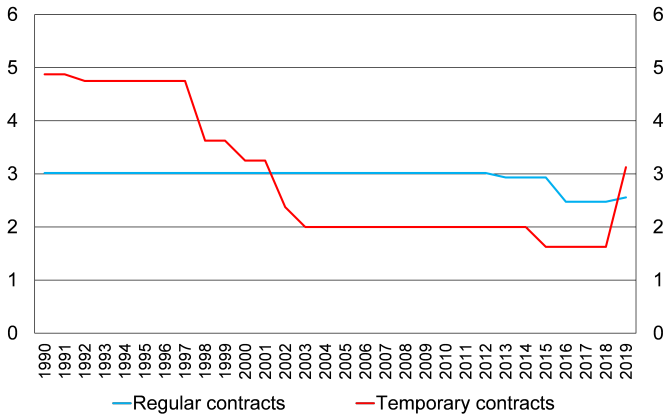


Figure 1: Employment protection legislation for individual and collective dismissals (regular contracts) and for temporary contracts. OECD data, version 1. For each year, indicators refer to regulation in force on the 1st of January. Unit of measure: 0-6 scale.

reintroduced some restrictions, raising the EP indicator for temporary contracts (see Appendix 11, section 11.2 for more details). Despite these reforms, the gap in EP between permanent and temporary workers remained persistent throughout the period, until 2019 when EP for temporary contracts experienced a rise (Figure 1).

2.1. Other labour regulations

In addition to the dismissal protections under Article 18, several other regulations in Italy apply at the 15-employee threshold, further strengthening the discontinuity in employer obligations. Firms exceeding this threshold are required to recognize company-level union representation ("Rappresentanza Sindacale Aziendale") and provide associated resources, such as time off and dedicated spaces. They also become subject to mandatory hiring quotas for workers with disabilities.[4] Initially conditional on new hires, this obligation became automatic at 15 employees from January 1, 2018.

Moreover, the 15-employee threshold is relevant for social security contributions and labour market policies (Lo Bello, 2021). Larger firms must finance and may be subject to extraordinary wage supplementation schemes (CIGS) in the event of restructuring or crisis, incurring higher contribution rates than smaller firms. They are also required to contribute to the NASpI unemployment insurance scheme in the event of dismissals, as established by Law 92/2012. These additional legal and financial burdens may contribute to firms' reluctance to grow beyond the threshold.

3. Data and descriptive statistics

We use administrative data provided by the National Social Security Institute (INPS), which collect information on the employment of all firms with at least one employee. A key aspect of our analysis involves identifying the firm's size, as the firing costs thresholds depend on this dimension.

[4]Law 68/1999 required companies with 15 to 35 employees to hire a disabled worker, but this obligation only applied in the event of a new hire. Legislative Decree 151/2015 and the subsequent Legislative Decree 185/2016 (amending the Jobs Act) have revised these rules, introducing new obligations and penalties for non-compliance.

The regulation (Article 18 of the Labour Code) defines the applicability of the threshold as follows: employers who have more than 15 employees in the production unit where the dismissal occurred; employers who have more than 15 employees, even if in multiple production units but within the same municipality where the production unit where the dismissal occurred is located; employers who have more than 60 employees in total. Furthermore, labour courts apply a specific definition to measure firm size around the threshold. This involves calculating the average number of full-time permanent contracts over the past six months, including part-time permanent contracts converted to full-time equivalents, and the average number of temporary employees hired in the past 24 months, weighted by their duration of employment. This process adds a degree of uncertainty to the determination of the firm's size, leaving firms near the threshold uncertain about whether they fall above or below it.

We define the size of the firm[5] in terms of the average number of full-time equivalent employees over the year, including permanent workers and temporary ones with at least a nine-month contract.[6] We exclude workers with apprenticeship contracts, as they are not considered in the legislation. We restrict our analysis to companies with 5 to 25 employees to focus on those near the threshold.[7]

We focus on the period 2005-2019 to avoid the confounding effects of the COVID-19 pandemic (after 2020).[8] Table 1 reports the main descriptive statistics. In terms of workforce composition, larger firms tend to employ a higher proportion of fixed-term contracts: firms with 15-25 employees report an average of 2.65 fixed-term workers, compared to about 1.0 in smaller firms. Regarding the sectoral composition, 32% of the companies in our sample (5-25 employees) operate in manufacturing, while 55% are active in the service sectors and the remaining 13% of the companies operate in construction. There are some differences on the two sides of the 15-employee threshold, with smaller firms being relatively less concentrated in manufacturing activities. With respect to geographical distribution, 54% of firms between 5 and 25 employees are located in northern Italy, 21% in central Italy, and the remaining 24% in the South, with no significant differences between the two subsamples.

To examine the heterogeneity of the threshold effect over time, we differentiate in two subperiods: the pre-reform period (2005-2011) and post-reform period (2012-2019) capturing the years influenced by recent labour market reforms. Additionally, we replicate the analysis considering the post-2014 period, to account for the Jobs Act alone.

As an initial examination of the threshold effect, Figure 2 illustrates the distribution of the annual average number of firms according to the size of the companies.[9] Visual analysis does not

[5]In the INPS archive on the universe of firms, we identify the primary location of a firm by using the "matricola madre" per municipality, since individual INPS registers ("matricola") do not necessarily denote distinct local units. We acknowledge the approximation involved, but we believe that this approach has a minimal impact on the results, given that more than 92% of the firms in the sample - mainly small firms - are associated with only one "matricola" linked to a unique "matricola madre". The overall number of "matricole" for firms in our sample was equal to 6.881.435, which drops to 6.317.794 after keeping the main site for each "matricola madre".

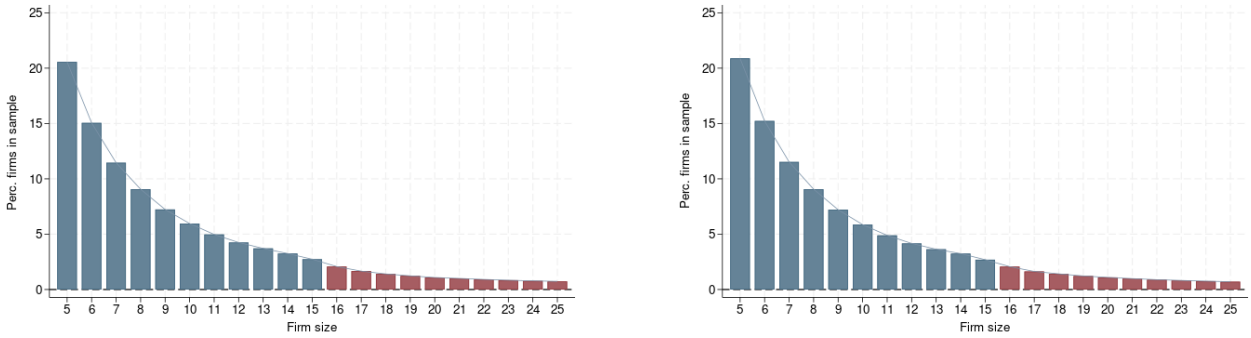
[6]Workers under temporary contracts are covered by EP during the duration of the contract but not upon termination.

[7]The impact of EP legislation on larger firms may differ from its effect on firms around the 15-employee threshold due to various factors: differences in production technology, reliance on firm-specific human capital, wage levels, worker turnover rates, capacity for reallocation between units, and cost structure.

[8]During the COVID-19 pandemic, EP regulations were temporarily adjusted to protect workers. In particular, in Italy, from March 2020 individual and collective dismissals were frozen (Decree Law 18/2020, "Cure Italy"). The ban was gradually lifted from August 2020 and ended definitively in December 2021.

[9]Figure 2 illustrates the distribution for the 2005-2011 and 2012-2019 sub-periods. Graphs for the 2005-2019

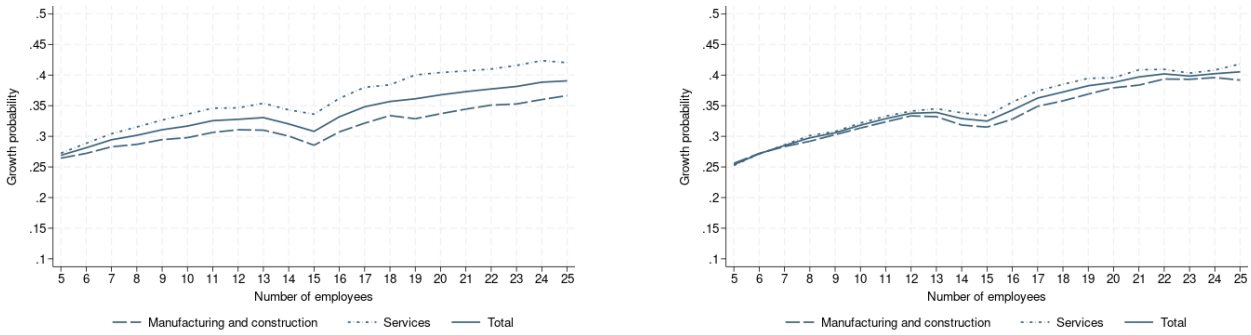
reveal any significant break in the firm-size distribution around the threshold, both in the pre-reform and post-reform intervals. In both sub-periods, we observe a small decline at size 15-16, suggesting firms' reluctance to cross the threshold.



(a) Period:2005-2011 (b) Period:2012-2019

Figure 2: Percentage of firms by size class and different period over the total number of existing firms. Source: our calculations based on INPS data.

Subsequently, we examine how firm size relates to the probability of year-on-year employment growth, restricting the analysis to firms with between 5 and 25 employees (Figure 3). In line with Schivardi and Torrini (2008), we find that while the probability of employment growth generally rises with firm size, it drops noticeably at the 15-employee threshold. Additionally, the figure suggests that there is a convergence in growth probability between the industry and service sectors after 2011. Furthermore, when the analysis is restricted to the post-Jobs Act years, the overall growth probability is higher (Figure 9, panel a in Appendix 9).

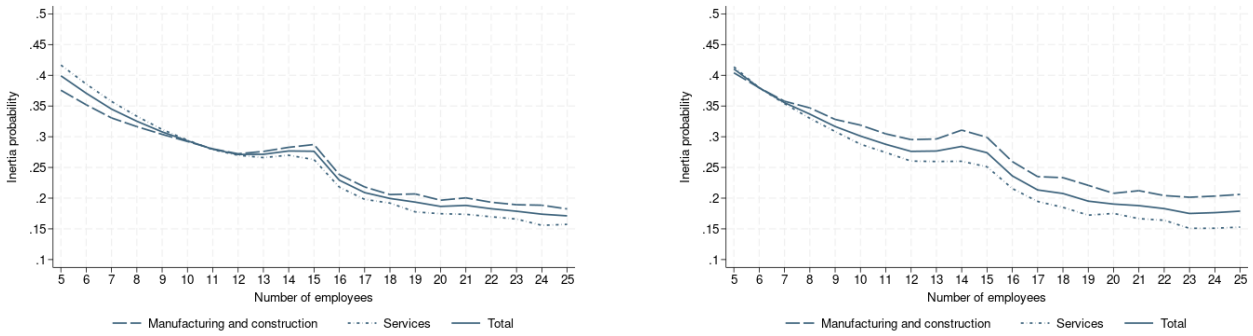


(a) Period:2005-2011 (b) Period:2012-2019

Figure 3: Probability of growth by firm size. Growth refers to firms that increase the number of employees from one year to the next. Source: our elaborations on INPS data.

To complement our analysis of firms' growth patterns, we further examine the probabilities of both employment inertia and reduction. Inertia, defined as the likelihood that a firm maintains the same number of employees year-over-year, generally declines with firm size, but exhibits a pronounced peak at the 15-employee threshold (Figure 4), consistent with the observed discontinuity in growth probability. A similar, though less marked, threshold effect emerges when considering the probability of a reduction in employment. (Figure 5).

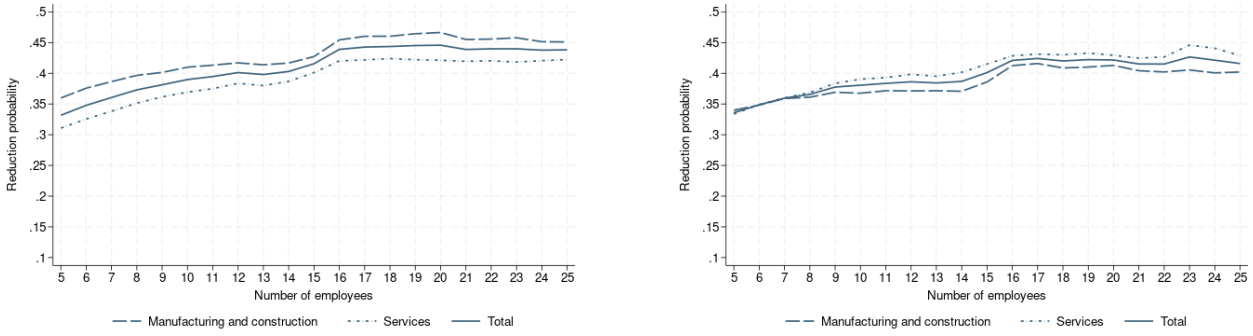
interval are reported in Appendix 10.



(a) Period:2005-2011

(b) Period:2012-2019

Figure 4: Inertia probability by firm size. Inertia refers to firms that do not change the number of employees from one year to the next. Source: our elaborations on INPS data.



(a) Period:2005-2011

(b) Period:2012-2019

Figure 5: Probability of reduction by firm size. Reduction refers to firms that decrease the number of employees from one year to the next. Source: our elaborations on INPS data.

4. Empirical strategy

Following Schivardi and Torrini (2008) and Hijzen et al. (2017), to quantify the threshold effect on growth probability, we estimate the following linear model at the firm-year level.

$$y_{it} = \alpha + \beta_1 L + \beta_2 L^2 + \beta_3 L^3 + \beta_4 L^4 + \gamma_1 D_{13} + \gamma_2 D_{14} + \gamma_3 D_{15} + \omega_1 X_{it} + \phi_{tr} + \phi_{ts} + \epsilon_{it} \qquad (1)$$

where y_{it} is a dummy equal to 1 if $L_{it} > L_{it-1}$ and 0 otherwise; L is the number of employees of firm i in year t: we include a fourth-degree polynomial in size to capture the size-dependent trend in growth probability. Dummies D_{13}, D_{14}, D_{15} are equal to one if the firm has 13, 14 or 15 employees[10] and the last two identify the threshold effect. The coefficients of interest are γ_1, γ_2 and γ_3, which represent how the growth probability deviates at the threshold from the overall trend. The threshold for EP legislation is explicitly set at 15 employees. However, in line with the literature, we also include the coefficient for 13 and 14 employees to account for the potential precautionary behaviour of firms arising from uncertainty in the threshold calculations. In fact, measurement errors may occur in average monthly employment data, particularly when calculating

[10]The dummies are created by rounding the annual average number of employees upwards to identify the threshold crossing, in line with the provisions of the regulation.

positions involving fixed-term contracts. In addition, the model also incorporates firm age up to the second degree (X_{it}). We include fixed effects at the year-region (ϕ_{tr}) and year-sector level (ϕ_{ts}). Standard errors are clustered at firm level.

We further explore the possible heterogeneity behind the main results that could be informative about the effects of the Fornero and Jobs Act reforms. More precisely, we fully interact our baseline model with a dummy variable equal to 1 for the years 2012–2019 (D_{y1219}). By full interaction we refer to a model in which the interaction variable is included not only as a regressor but also interacted with both the variable of interest and all other covariates. This allows us to combine the flexibility gain of a sample-split (by not forcing the other coefficients to be the same between the two groups) and the possibility of easily testing the statistical significance. Additionally, we fully interact our baseline model with another dummy variable equal to 1 for the period after 2014 (D_{y1519}) to capture the standalone effect of the Jobs Act.

4.1. Difference in discontinuity model

To better isolate the effect of the reform at the size threshold, we also estimate a difference-in-discontinuities (diff-in-disc) model. A simple regression discontinuity design (RDD) would be insufficient in this context, as other policies related to firm size also create discontinuities at the 15-employee threshold (see Section 2.1). Similarly, a difference-in-differences (DiD) approach would be problematic due to the presence of pre-existing differential trends in the growth probabilities between firms (see Section 3). The diff-in-disc strategy addresses these limitations by combining two sources of variation: the cross-sectional discontinuity at the threshold and the temporal variation induced by the reform. Both the fully interacted model and the diff-in-disc specification exploit this combined variation to identify the reform effect. The main difference between the two lies in the functional form assumptions. The fully interacted model imposes a linear specification in firm size, allowing all coefficients (including the slope and intercept) to vary flexibly across periods through full interactions with the post-reform indicator. In contrast, the diff-in-disc specification estimates separate local linear regressions on either side of the threshold, before and after the reform, and compares the changes in the resulting discontinuities. This approach isolates the causal effect of the reform on firing costs while reducing concerns about functional form misspecification and potential confounding effects from other size-dependent policies. Moreover, by comparing discontinuities across periods, the diff-in-disc design is particularly well-suited to capture the heterogeneity of the threshold effect over time, allowing us to assess how the impact of size-dependent regulation evolves in response to policy changes.

According to Grembi et al. (2016), we define W_{it} as the first treatment for the number of employees of firm i in year t and R_{it} as the second treatment, equal to one if the rules are relaxed after reforms and equal to zero if they are still binding. Firms with a number of employees (P_{it}) below the threshold $P_c = 15$ have lower firing costs. The assignment mechanism for both treatments can therefore be described as follows:

$$W_{it} = \begin{cases} 1 & \text{if } P_{it} < P_c, \\ 0 & \text{otherwise} \end{cases}$$

$$R_{it} = \begin{cases} 1 & \text{if } P_{it} < P_c \text{ and } t \geq t_0, \\ 0 & \text{otherwise} \end{cases}$$

The diff-in-disc estimator can be implemented by estimating the boundary points of four regression functions of Y_{it} on P_{it}: two on both sides of P_c, both before and after t_0. We apply a local linear

regression, following Gelman and Imbens (2019) and Grembi et al. (2016). The method consists in fitting linear regression functions to the observations distributed within a distance h on either side of P_c, both before and after t_0. Formally, we restrict the sample to firms whose number of employees (P_{it}) is comprised in the interval $P_{it} \in [P_c - h, P_c + h]$ and estimate the following model:

$$Y_{it} = \omega + \nu D_{it} + \xi P^*_{it} + \eta A_t + \beta A_t D_{it} + \theta D_{it} P^*_{it} + \mu A_t P^*_{it} + \chi A_t P^*_{it} D_{it} + \epsilon_{it} \tag{2}$$

where

- $A_t = 1[t \geq t_0]$
- P_{it}: firm size
- $P_c = 15$ employees
- $P^*_{it} = P_{it} - P_c$: normalized firm size
- $D_{it} = 1[P^*_{it} > 0]$: treatment rule

Standard errors are clustered at the firm level. The coefficient β is the primary parameter of interest, capturing the treatment effect in the post-reform period. We consider a bandwidth of 10 (h), restricting our sample to a panel of firms with a number of employees within the range of 5 to 25.

To ensure completeness, we consider two post-treatment periods to encompass both the post-Fornero reform (since 2012) and the post-Jobs Act (since 2015) periods. Furthermore, we have also conducted additional checks by evaluating the results at the 14-employees threshold[11], addressing potential concerns about measurement errors.

5. Threshold effect on firms employment growth

Table 2 presents the linear model estimates for the entire period from 2005 to 2019. Column 1 reports the findings for the baseline specification. Consistent with the existing literature, we observe a lower probability of growth at the 15-employee mark. The coefficient for D_{15} is negative and statistically significant, indicating that the likelihood of growth decreases by 2.6 percentage points near the EP threshold reaching 31.7% (Schivardi and Torrini (2008) find a decrease by -1.5 percentage points). The coefficient for D_{14} is also negative and statistically significant, though its magnitude is half that of D_{15}. This result confirms the buffer behaviour by firms that could hire one more worker without exceeding the 15-employee threshold. The coefficient for D_{13} is not statistically different from zero.

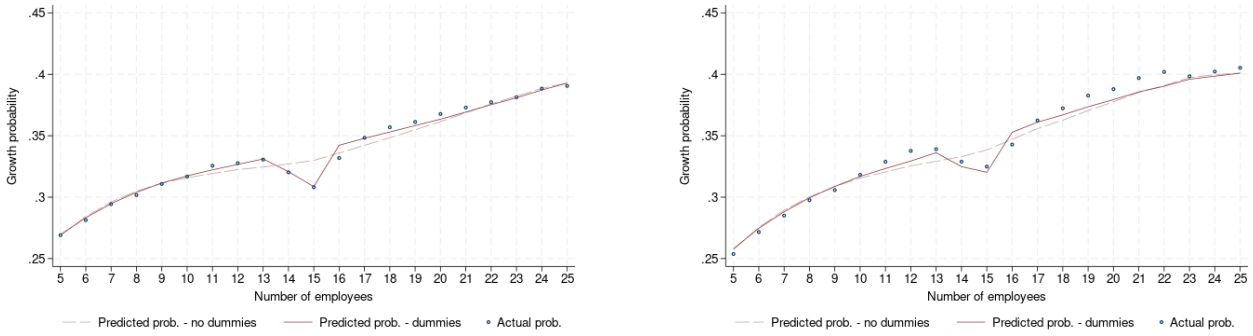
The results in the second column represent the model with full interaction terms, where each variable is interacted with a dummy equal to 1 for the years 2012–2019. The coefficients for D_{13}, D_{14}, and D_{15} remain largely unchanged. The coefficients on $D_{13} \times D_{y1219}$, $D_{14} \times D_{y1219}$ and $D_{15} \times D_{y1219}$ are not statistically significant, suggesting the threshold effect didn't change after 2012.

Column 3 presents the results when the model is fully interacted with a dummy equal to 1 for the post-2014 period. We find a negative and statistically significant effect at size 14 ($D_{14} \times D_{y1519}$), while $D_{15} \times D_{y1519}$ and $D_{13} \times D_{y1519}$ are not statistically significant.

[11] When considering the 14-employees threshold, the sample size changes because the analysis includes firms with between 4 and 24 employees, rather than those with between 5 and 25 employees, used previously.

The positive relationship between firm size and growth probability becomes stronger after 2014: the coefficient for $L \times D_{y1519}$ is positive and statistically significant.

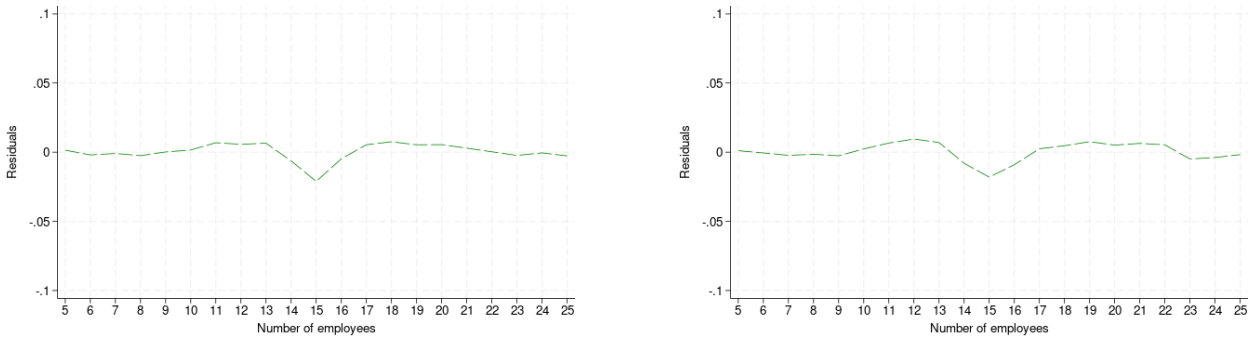
In columns 4 and 5 of Table 2 we repeat the exercise for manufacturing and services separately. Once we split the sample, the threshold effect remains roughly similar, with no significant difference after 2011.



(a) Period:2005-2011

(b) Period:2012-2019

Figure 6: Probability of growth and predicted probabilities, all sectors. Note: The probability of growth (y-axis) is measured as the share of firms that increase the number of employees from one year to the next. The predicted values are from estimates conducted using the same specification as those reported in column 1 of Table 2, but split for the two sub-periods indicated; predicted without dummies are from the same regression without the size dummies for 13, 14, and 15 employees. Size class is the number of employees. Source: our elaborations on INPS data.



(a) Residuals of regression - 2005-2011

(b) Residuals of regression - 2012-2019

Figure 7: Residuals of the regression for the periods 2005-2011 and 2012-2019. Note: The residuals (y-axis) are obtained from estimates conducted using the same specification as those reported in column 1 of Table 2, but split for the three sub-periods. The plots display the deviation of observed values from predicted values, helping to assess model fit. Source: our elaborations on INPS data.

The empirical findings presented in Table 2 are further supported by graphical evidence. Figures 6 and 7 illustrate the actual and predicted probabilities of firm employment growth by firm size and sub-periods, offering a visual confirmation of the threshold effects and their evolution over time. These figures help to better contextualize the magnitude and persistence of the patterns identified in the regression results.

Figure 6 shows that the model provides a good fit to the actual probabilities, with a clear drop in the probability of growth around the 15-employee threshold. This visual discontinuity mirrors

the negative and significant coefficients for D_{14} and D_{15} discussed earlier. However, in the period 2012-19, this effect appears to level off between firm sizes 14 and 15.

Figure 7 illustrates this point by plotting the residuals — i.e., the differences between the observed and predicted values — highlighting the deviations around the threshold. As expected, residuals are close to zero across most firm sizes, except in the 14–15 employee range, where the gap between actual and predicted values is most evident.

Table 3 presents some robustness checks. Columns 1 and 2 show the results when using the logarithm of firm size.[12] Also in this case the negative threshold effect remains confirmed. In the baseline (column 1) the coefficient for D_{15} is statistically significant and equal to -0.031 while the coefficient for D_{14} is still significant but smaller in magnitude. A marginally significant small negative effect is found at size 13. In the fully interacted model (column 2) the coefficients for $D_{13} \times D_{y1219}$, $D_{14} \times D_{y1219}$, $D_{15} \times D_{y1219}$ are not statistically significant.

Columns 3 and 4 report the results when using a different clustering approach: we cluster at the two-digit Ateco and region level, compared to the main model where clusters are at the firm level. The results of these alternative specifications confirm the robustness of the original findings.

5.1. Difference in discontinuity model

Table 4 and 5 present the main estimation results from the difference-in-discontinuities (diff-in-disc) approach, respectively for the Fornero Reform and the Jobs Act. The primary outcome of interest is the employment growth probability. We report our baseline local linear regression estimates, as specified in equation 2, followed by two additional specifications. The first includes fixed effects by region and sector (at 2-digit Ateco code), while the second incorporates firm size (up to the fourth degree) and firm age (up to the second degree) as controls, in line with the specifications used for the model in equation 1.

The results for the post-Fornero Reform period indicate a negative effect at the 15-employee threshold, though not statistically different from zero. Conversely, at the 14-employee threshold, the effect turns positive but remains imprecisely estimated. In the case of the Jobs Act, while effects continue to lack statistical significance, their signs reverse compared to the Fornero Reform: at the 15-employee threshold, the estimated effect is positive, whereas at the 14-employee threshold, it becomes negative.

To further test the robustness of our results, we also estimate the model using a balanced panel, which controls for potential biases related to firms dropping in and out of the sample. As shown in Tables 8 and 9, these additional specifications reveal a significant effect of the Fornero Reform at the 14-employee threshold, suggesting the importance of considering firm-level dynamics and temporal consistency in the analysis of threshold effects. Overall, while the main estimates consistently identify a negative threshold effect on employment growth at the 15-employee, we do not find robust evidence of a significant change in this effect following the reforms. One possible interpretation is that the reforms, although reducing firing costs for small firms, were not sufficient to offset other constraints that limit firm growth around the threshold. These may include factors such as administrative burdens, managerial capacity constraints, or remaining size-contingent regulations, which could continue to discourage growth beyond 15 employees even after the reforms.

[12] Similar results are obtained using the square root of firm size.

6. Threshold effect on the use of fixed-term contracts

In this section, we examine the impact of the threshold effect on the share of fixed-term contracts. Figure 8 shows how this proportion varies according to firms' size: above the EP threshold firms adopt greater flexibility. This is in line with existing literature (Hijzen et al., 2017), showing that firms exceeding the regulatory threshold strategically respond to stricter regulations on permanent contracts by increasing their reliance on temporary employment. Additionally, figure 8 indicates that the use of flexible contracts is slightly higher after 2011.

To measure the threshold effect and the heterogeneous impact of recent labour market reforms, we estimate the following linear model, similar to the one presented in Section 4.

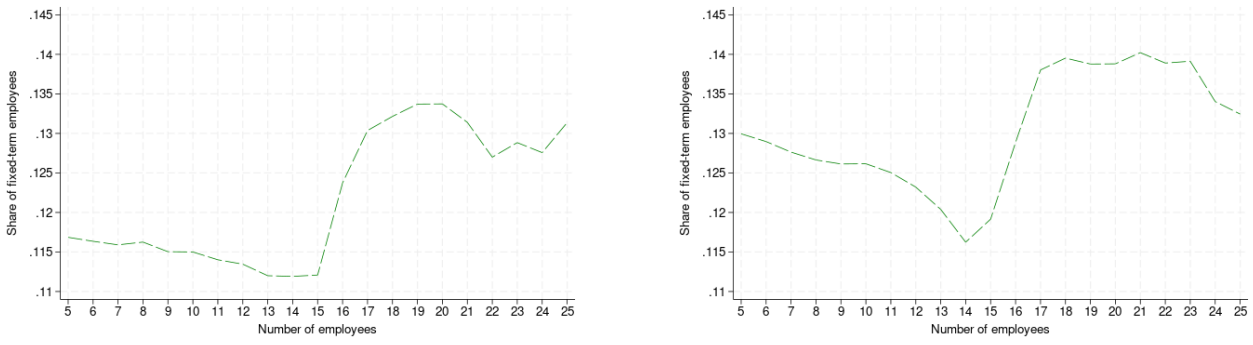
$$y_{it} = \alpha + \beta_1 L + \beta_2 L^2 + \beta_3 L^3 + \beta_4 L^4 + \gamma_1 D_{16+} + \omega_1 X_{it} + \phi_{tr} + \phi_{ts} + \epsilon_{it} \tag{3}$$

where y_{it} is the share of fixed-term contracts at the firm level and L is the number of employees of firm i in year t (we include a fourth-degree polynomial in size). We include the dummy variable D_{16+}, which is equal to one for firms with more than 15 employees, to account for the effect of being above the EP threshold. As discussed in Section 4, the regulatory threshold is based on the rounded-up annual average number of employees: D_{16+} captures firms whose average employment exceeds 15 and thus are formally considered above the threshold for regulatory purposes.

Column (1) of Table 6 presents the baseline results: the coefficient for D_{16+} is statistically significant and positive. The discontinuity in EP increases the incidence of temporary work by 0.7 percentage points from an average probability of 11.6% for companies with 15 employees.

Columns (2) and (3) present the results for the fully interacted models, where the interaction term is a dummy variable equal to 1 for either the post-2011 period or the post-2014 years, respectively. In both cases, the interaction terms with the dummy D_{16+} (i.e.: $D_{16+} \times D_{y1219}$ or $D_{16+} \times D_{y1519}$) are negative and statistically significant, suggesting that there is a reduction in the threshold effect after recent reforms.

These results are robust to alternative models where a linear or third-order specification is used to control for firm size.



(a) Period:2005-2011

(b) Period:2012-2019

Figure 8: Share of fixed-term employees by firm size. Source: our elaborations on INPS data.

Following the same methodological approach as in Section 5.1 (see equation 2), we proceed by implementing the difference-in-discontinuities (diff-in-disc) approach. This allows us to assess whether these labour market reforms affected the share of fixed-term contracts among firms near the 15-employee threshold. Table 7 presents the results of the diff-in-disc estimates, separately for

the Fornero Reform (post-2012) and the Jobs Act (post-2015). As before, the table reports three specifications for each reform: a baseline model (column 1), a model including region and sector fixed effects (column 2), and an extended specification incorporating additional controls for firm characteristics, such as firm size (up to the fourth degree) and firm age (up to the second degree; column 3).

The estimates for the Fornero Reform confirm a negative impact on the share of fixed-term contracts. While the baseline coefficient is small and not statistically significant, the inclusion of fixed effects (columns 2 and 3) leads to a larger negative coefficient, which becomes statistically significant. For the Jobs Act, the results also display a negative relationship, with coefficients progressively increasing in magnitude and statistical significance across specifications. While the overall use of fixed term contracts has increased over the 2005-2019 period (Figure 8), the difference at the 15 employees threshold has become less stark following the introduction of the regulatory changes. Overall, while the results do not show a significant increase in firm-level employment (as discussed in Section 5), they suggest a more even reliance of fixed-term contracts for the firms on both sides of the threshold.

7. Conclusions

This paper examines the impact of employment protection on firm growth and workforce composition, leveraging administrative data from Italian firms between 2005 and 2019, with a particular focus on labour market reforms implemented after 2012. Our findings provide empirical support for the hypothesis that stringent and size-dependent labour regulations create a disincentive for firms to expand beyond regulatory thresholds. Specifically, we observe that firms approaching the 15-employee cutoff exhibit lower probabilities of growth, aligning with previous evidence on the constraining effects of EP on firm dynamics. There is no significant change after the recent labour market reforms.

Moreover, our analysis of workforce composition reveals that firms facing stricter EP requirements disproportionately rely on temporary contracts, highlighting the role of policy-induced distortions in employment structures. This effect has been particularly pronounced in Italy's dual labour market, where past reforms have liberalized temporary contracts while maintaining rigid protections for permanent employees. However, the most recent legislative changes—the Fornero reform (2012) and the Jobs Act (2015)—appear to have mitigated this distortion by reducing the regulatory gap between contract types.

In conclusion, our results suggest that while these reforms did not significantly alter firms' growth behaviour near the threshold, they contributed to a more balanced use of temporary and permanent contracts at the 15-employee cutoff.

8. Tables

Table 1: Descriptive statistics - Sample 2005-2019

	$> 5, \leq 15$	$> 15, \leq 25$	$> 5, \leq 25$	Totale
Number of employees	8.83	20.03	10.37	7.76
	(3.41)	(4.66)	(5.29)	(160.64)
Employee characteristics				
Nr of employees relevant for EPL (1)	8.32	19.08	9.80	7.37
	(2.78)	(2.87)	(4.64)	(159.05)
Share of managers	0.31	0.31	0.31	0.30
	(0.34)	(0.31)	(0.33)	(0.40)
Fixed-term employees	1.01	2.65	1.24	0.95
	(1.80)	(3.86)	(2.27)	(56.27)
Firm data				
Firm age	14.33	16.04	14.57	10.74
	(11.85)	(12.69)	(11.99)	(10.86)
Manufacturing	0.31	0.39	0.32	0.20
	(0.46)	(0.49)	(0.47)	(0.40)
Construction	0.14	0.11	0.13	0.15
	(0.34)	(0.31)	(0.34)	(0.36)
Services	0.56	0.50	0.55	0.66
	(0.50)	(0.50)	(0.50)	(0.48)
Geographical location				
North	0.54	0.57	0.54	0.49
	(0.50)	(0.49)	(0.50)	(0.50)
Centre	0.21	0.20	0.21	0.21
	(0.41)	(0.40)	(0.41)	(0.41)
South	0.25	0.22	0.24	0.30
	(0.43)	(0.42)	(0.43)	(0.46)
Number of firms	3,810,835	609,809	4,420,644	22,896,965

Source: our calculations based on INPS data.

(1) Apprentices and seasonal workers are not included. Standard deviations in parenthesis.

Table 2: Probability of growth. Years: 2005-2019

	(1) With dummies	(2) Full int. 2012-19	(3) Full int. 2015-19	(4) Manuf. and costr full int. 1219	(5) Services full int. 1219
L	0.047***	0.043***	0.041***	0.031***	0.051***
	(0.003)	(0.004)	(0.003)	(0.006)	(0.006)
D_{13}	0.002	0.001	0.003	0.001	0.001
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
D_{14}	-0.013***	-0.012***	-0.011***	-0.011***	-0.015***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
D_{15}	-0.026***	-0.028***	-0.025***	-0.028***	-0.027***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
$L \times D_{y1219}$		0.006		0.017*	-0.001
		(0.006)		(0.008)	(0.008)
		(0.000)		(0.000)	(0.000)
$D_{13} \times D_{y1219}$		0.001		0.002	0.000
		(0.003)		(0.004)	(0.004)
$D_{14} \times D_{y1219}$		-0.001		-0.004	0.002
		(0.003)		(0.004)	(0.004)
$D_{15} \times D_{y1219}$		0.004		0.004	0.003
		(0.003)		(0.004)	(0.004)
$L \times D_{y1519}$			0.017**		
			(0.006)		
$D_{13} \times D_{y1519}$			-0.004		
			(0.003)		
$D_{14} \times D_{y1519}$			-0.006*		
			(0.003)		
$D_{15} \times D_{y1519}$			-0.002		
			(0.003)		
N	4,972,757	4,972,757	4,972,757	2,197,550	2,775,207
adj. R^2	0.034	0.034	0.034	0.031	0.036
Year-Region FE	Yes	Yes	Yes	Yes	Yes
Year-Ateco FE	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: In addition to the regressors shown in the table, the model also includes other unreported controls such as firm size up to the fourth degree and firm age up to the second degree, following existing literature.

Table 3: Probability of growth - Robustness check. Years: 2005-2019

	(1) Log size	(2) Log size - full int.	(3) Cluster by sector	(4) Cluster by sector - full int.
$log(L)$	0.088***	0.079***		
	(0.001)	(0.001)		
D_{13}	-0.002*	-0.003	0.002	0.001
	(0.001)	(0.002)	(0.001)	(0.002)
D_{14}	-0.018***	-0.018***	-0.013***	-0.012***
	(0.001)	(0.002)	(0.002)	(0.002)
D_{15}	-0.031***	-0.034***	-0.026***	-0.028***
	(0.001)	(0.002)	(0.002)	(0.003)
$log(L) \times D_{y1219}$		0.018***		
		(0.001)		
$D_{13} \times D_{y1219}$		0.001		0.001
		(0.002)		(0.002)
$D_{14} \times D_{y1219}$		-0.001		-0.001
		(0.002)		(0.002)
$D_{15} \times D_{y1219}$		0.005		0.004
		(0.003)		(0.002)
L			0.047***	0.043***
			(0.003)	(0.004)
$L \times D_{y1219}$				0.006
				(0.004)
N	4,972,757	4,972,757	4,9727,57	4,972,757
adj. R^2	0.034	0.034	0.034	0.034
Year-Region FE	Yes	Yes	Yes	Yes
Year-Ateco FE	Yes	Yes	Yes	Yes

Standard errors in parentheses

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: In addition to the regressors shown in the table, the model also includes other unreported controls such as firm size up to the fourth degree and firm age up to the second degree, following existing literature.

Table 4: Diff-in-Disc Estimates on Probability of Growth - Post Fornero Reform

	(1) Baseline	(2) Other FE	(3) Other controls	(4) Baseline	(5) Other FE	(6) Other controls
Effect post-treatment	-0.0021	-0.0022	-0.0030	0.0008	0.0011	0.0008
	(0.0028)	(0.0028)	(0.0028)	(0.0025)	(0.0025)	(0.0025)
N	3,925,416	3,925,416	3,922,541	4,902,226	4,902,226	4,898,566
adj. R^2	0.004	0.009	0.021	0.005	0.010	0.023
Region_FE	No	Yes	Yes	No	Yes	Yes
Ateco_FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Bandwith	10	10	10	10	10	10
Threshold	15 employees	15 employees	15 employees	14 employees	14 employees	14 employees

Standard errors in parentheses. Clustered at firm level.

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: The reported coefficient corresponds to the interaction between the treatment indicator (firms above the 15-employee threshold) and the post-reform period indicator (from 2012 onward). This coefficient captures the estimated difference-in-discontinuities effect of the Fornero reform on the probability that a firm increases its employment. All regressions include the full set of interaction terms specified in the difference-in-discontinuities framework; other coefficients are omitted for brevity.

When considering the 14-employees threshold, the sample size changes because the analysis includes firms with between 4 and 24 employees, rather than those with between 5 and 25 employees, used previously.

Table 5: Diff-in-Disc Estimates on Probability of Growth - Post Jobs Act

	(1) Baseline	(2) Other FE	(3) Other controls	(4) Baseline	(5) Other FE	(6) Other controls
Effect post-treatment	0.0036	0.0035	0.0030	-0.0010	-0.0007	-0.0006
	(0.0030)	(0.0030)	(0.0030)	(0.0027)	(0.0026)	(0.0026)
N	3,925,416	3,925,416	3,922,541	4,902,226	4,902,226	4,898,566
adj. R^2	0.005	0.010	0.021	0.006	0.010	0.023
Region_FE	No	Yes	Yes	No	Yes	Yes
Ateco_FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Bandwith	10	10	10	10	10	10
Threshold	15 employees	15 employees	15 employees	14 employees	14 employees	14 employees

Standard errors in parentheses. Clustered at firm level.

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: The reported coefficient corresponds to the interaction between the treatment indicator (firms above the 15-employee threshold) and the post-reform period indicator (from 2015 onward). This coefficient captures the estimated difference-in-discontinuities effect of the Jobs Act reform on the probability that a firm increases its employment. All regressions include the full set of interaction terms specified in the difference-in-discontinuities framework; other coefficients are omitted for brevity.

When considering the 14-employees threshold, the sample size changes because the analysis includes firms with between 4 and 24 employees, rather than those with between 5 and 25 employees, used previously.

Table 6: Share of fixed terms contracts. Years: 2005-2019

	(1) With dummies	(2) Full int. 2012-19	(3) Full int. 2015-19	(4) Manuf and constr full int. 1219	(5) Services full int. 1219
D_{16+}	0.007***	0.009***	0.008***	0.009***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
$D_{16+} \times D_{y1219}$		-0.004**		-0.003	-0.005*
		(0.001)		(0.001)	(0.002)
$D_{16+} \times D_{y1519}$			-0.003*		
			(0.001)		
N	5,042,362	5,042,362	5,042,362	2,223,292	2,819,070
adj. R^2	0.188	0.188	0.188	0.093	0.199
Year-Region FE	Yes	Yes	Yes	Yes	Yes
Year-Ateco FE	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: In addition to the regressors shown in the table, the model also includes other unreported controls such as firm size up to the fourth degree and firm age up to the second degree, following existing literature.

Table 7: Diff-in-disc estimates - Share of fixed terms contracts.

	Fornero Reform			Jobs Act		
	(1) Baseline	(2) Other FE	(3) Other controls	(1) Baseline	(2) Other FE	(3) Other controls
Effect						
post-treatment	-0.0016	-0.0025**	-0.0035***	-0.0019	-0.0031***	-0.0038***
	(0.0012)	(0.0011)	(0.0011)	(0.0013)	(0.0012)	(0.0012)
Region_FE	No	Yes	Yes	No	Yes	Yes
Ateco_FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Bandwith	10	10	10	10	10	10
Threshold	15 employees	15 employees	15 employees	15 employees	15 employees	15 employees
Post-treatment year	2012	2012	2012	2015	2015	2015
N	4,096,526	4,096,526	3,977,067	4,096,526	4,096,526	3,977,067
adj. R^2	0.001	0.143	0.172	0.001	0.143	0.172

Standard errors in parentheses. Clustered at firm level.

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Table 8: Diff-in-disc estimates on Probability of Growth - Post Fornero Reform (balanced panel)

	(1) Baseline	(2) Other FE	(3) Other controls	(4) Baseline	(5) Other FE	(6) Other controls
Effect						
post-treatment	-0.0028	-0.0030	-0.0036	0.0072**	0.0075**	0.0069*
	(0.0041)	(0.0041)	(0.0041)	(0.0036)	(0.0036)	(0.0036)
Region_FE	No	Yes	Yes	No	Yes	Yes
Ateco_FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Bandwith	10	10	10	10	10	10
Threshold	15 employees	15 employees	15 employees	14 employees	14 employees	14 employees
N	1,648,417	1,648,417	1,648,232	1,967,391	1,967,391	1,967,176
adj. R^2	0.007	0.012	0.018	0.010	0.014	0.021

Standard errors in parentheses. Clustered at firm level.

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: The reported coefficient corresponds to the interaction between the treatment indicator (firms above the 15-employee threshold) and the post-reform period indicator (from 2012 onward). This coefficient captures the estimated difference-in-discontinuities effect of the Fornero reform on the probability that a firm increases its employment. All regressions include the full set of interaction terms specified in the difference-in-discontinuities framework; other coefficients are omitted for brevity.
When considering the 14-employees threshold, the sample size changes because the analysis includes firms with between 4 and 24 employees, rather than those with between 5 and 25 employees, used previously.

Table 9: Diff-in-disc estimates on Probability of Growth - Post Jobs Act (balanced panel)

	(1) Baseline	(2) Other FE	(3) Other controls	(4) Baseline	(5) Other FE	(6) Other controls
Effect						
post-treatment	0.0021	0.0020	0.0012	0.0019	0.0022	0.0013
	(0.0043)	(0.0043)	(0.0043)	(0.0038)	(0.0038)	(0.0038)
Region_FE	No	Yes	Yes	No	Yes	Yes
Ateco_FE	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes
Bandwith	10	10	10	10	10	10
Threshold	15 employees	15 employees	15 employees	14 employees	14 employees	14 employees
N	1,648,417	1,648,417	1,648,232	1,967,391	1,967,391	1,967,176
adj. R^2	0.006	0.011	0.018	0.008	0.013	0.021

Standard errors in parentheses. Clustered at firm level.

* ($p < 0.05$), ** ($p < 0.01$), ***($p < 0.001$)

Note: The reported coefficient corresponds to the interaction between the treatment indicator (firms above the 15-employee threshold) and the post-reform period indicator (from 2015 onward). This coefficient captures the estimated difference-in-discontinuities effect of the Jobs Act reform on the probability that a firm increases its employment. All regressions include the full set of interaction terms specified in the difference-in-discontinuities framework; other coefficients are omitted for brevity.
When considering the 14-employees threshold, the sample size changes because the analysis includes firms with between 4 and 24 employees, rather than those with between 5 and 25 employees, used previously.

References

Andrews, D. and F. Cingano (2014): "Public policy and resource allocation: evidence from firms in Oecd countries," *Economic Policy*, 29, 253–296.

Autor, D. H. (2003): "Outsourcing at will: The contribution of unjust dismissal doctrine to the growth of employment outsourcing," *Journal of labor economics*, 21, 1–42.

Bartelsman, E., J. Haltiwanger, and S. Scarpetta (2009): "Measuring and analyzing cross-country differences in firm dynamics," in *Producer dynamics: New evidence from micro data*, University of Chicago Press, 15–76.

Boeri, T. and P. Garibaldi (2009): "Beyond eurosclerosis," *Economic Policy*, 24, 409–461.

——— (2019): "A tale of comprehensive labor market reforms: Evidence from the Italian jobs act," *Labour Economics*, 59, 33–48.

Botero, J. C., S. Djankov, R. L. Porta, F. Lopez-de Silanes, and A. Shleifer (2004): "The regulation of labor," *The Quarterly Journal of Economics*, 119, 1339–1382.

Bugamelli, M., F. Lotti, M. Amici, E. Ciapanna, F. Colonna, F. Dï¿½Amuri, S. Giacomelli, A. Linarello, F. Manaresi, G. Palumbo, and Filippo (2018): "Productivity growth in Italy: a tale of a slow-motion change," Questioni di Economia e Finanza (Occasional Papers) 422, Bank of Italy, Economic Research and International Relations Area.

Cirillo, Valeria, F. M. and D. Guarascio (2017): "Labour market reforms in Italy: evaluating the effects of the Jobs Act." *Economia Politica*, 211–232.

Freeman, R. B. (2005): "Labour market institutions without blinders: The debate over flexibility and labour market performance," *International Economic Journal*, 19, 129–145.

Gelman, A. and G. Imbens (2019): "Why high-order polynomials should not be used in regression discontinuity designs," *Journal of Business & Economic Statistics*, 37, 447–456.

Gnocato, N., F. Modena, and C. Tomasi (2020): "Labor market reforms and allocative efficiency in Italy," *Labour Economics*, 67.

González, X. and D. Miles-Touya (2012): "Labor market rigidities and economic efficiency: Evidence from Spain," *Labour Economics*, 19, 833–845.

Grembi, V., T. Nannicini, and U. Troiano (2016): "Do fiscal rules matter?" *American Economic Journal: Applied Economics*, 1–30.

Grubb, D. and W. Wells (1993): "Employment regulation and patterns of work in EC countries," *OECD Economic studies*, 7–7.

Haltiwanger, J., S. Scarpetta, and H. Schweiger (2014): "Cross country differences in job reallocation: The role of industry, firm size and regulations," *Labour Economics*, 26, 11–25.

Hijzen, A., L. Mondauto, and S. Scarpetta (2017): "The impact of employment protection on temporary employment: Evidence from a regression discontinuity design," *Labour Economics*, 46, 64–76.

Hopenhayn, H. and R. Rogerson (1993): "Job Turnover and Policy Evaluation: A General Equilibrium Analysis," *Journal of Political Economy*, 101, 915–938.

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

Lo Bello, S. (2021): "La CIG: evoluzione storica, caratteristiche e limiti (CIG: Historical Evolution, Features and Limitations)," *Bank of Italy Occasional Paper*.

Nickell, S. and R. Layard (1999): "Labor market institutions and economic performance," *Handbook of labor economics*, 3, 3029–3084.

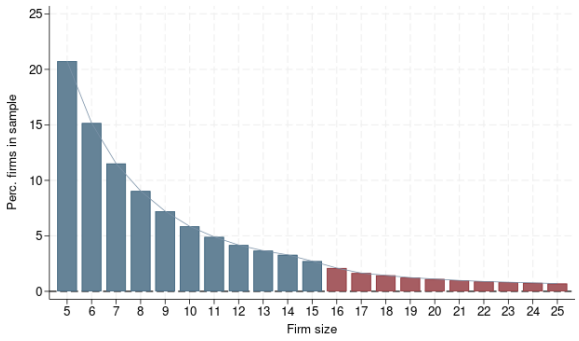
Oecd (1999): "Employment protection and labour market performance," *Employment Outlook*, 61, 47–132.

Petrin, A. and J. Sivadasan (2013): "Estimating Lost Output from Allocative Inefficiency, with an Application to Chile and Firing Costs," *The Review of Economics and Statistics*, 95, 286–301.

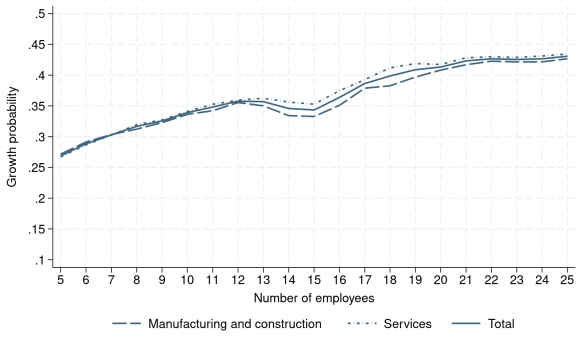
Pigini, C. and S. Staffolani (2022): "Firing Costs and Job Loss: The Case of the Italian Jobs Act," *Italian Economic Journal: A Continuation of Rivista Italiana degli Economisti and Giornale degli Economisti*, 8, 105–143.

Schivardi, F. and R. Torrini (2008): "Identifying the effects of firing restrictions through size-contingent differences in regulation," *Labour Economics*, 15, 482–511.

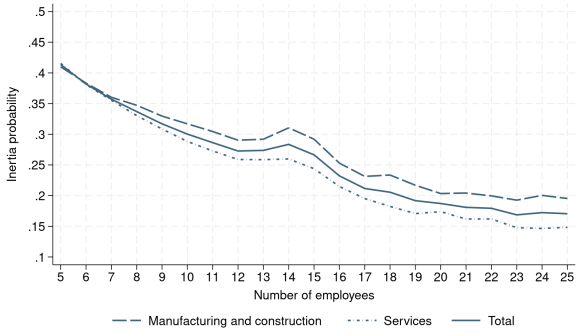
9. Appendix A - Figures for the period 2015-2019



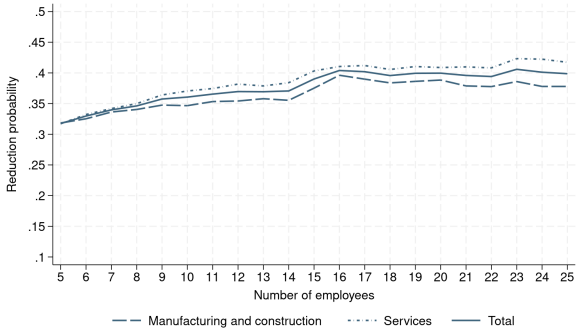
(a) Percentage of firms by size class



(b) Probability of growth by firm size

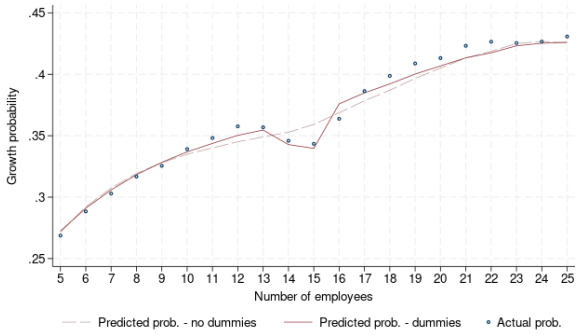


(c) Inertia probability by firm size

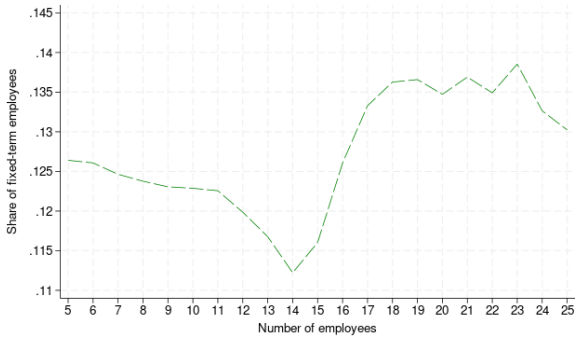


(d) Probability of reduction by firm size

Figure 9: Sample statistics period 2015-2019. Source: our elaborations on INPS data.



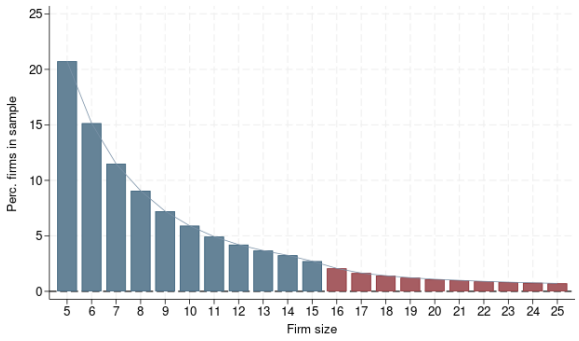
(a) Probability of growth and predicted probabilities



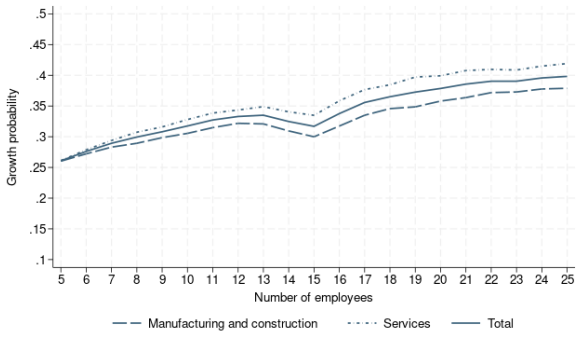
(b) Share of fixed-term employees by firm size

Figure 10: Analysis for the period 2015-2019. Source: our elaborations on INPS data.

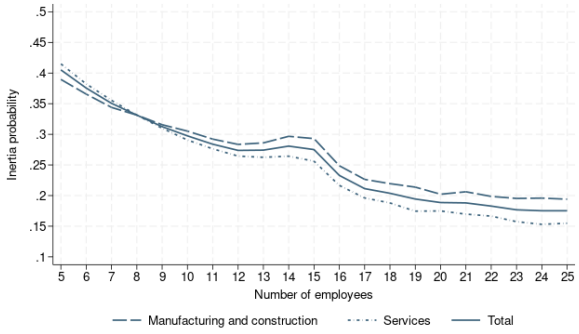
10. Appendix B - Figures for the period 2005-2019



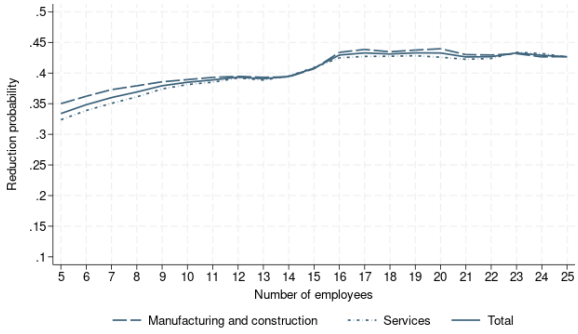
(a) Percentage of firms by size class



(b) Probability of growth by firm size

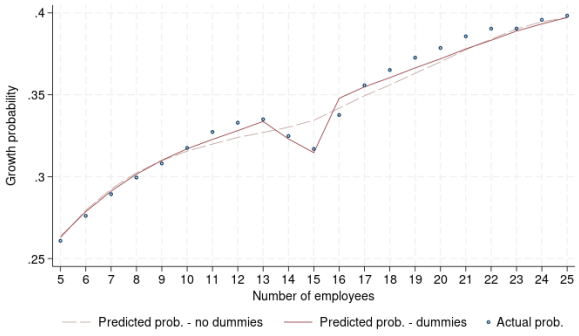


(c) Inertia probability by firm size

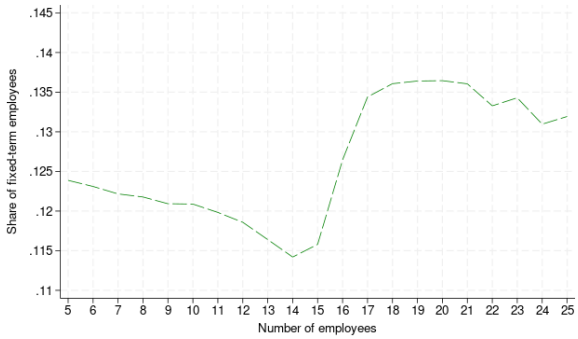


(d) Probability of reduction by firm size

Figure 11: Sample statistics period 2005-2019. Source: our elaborations on INPS data.



(a) Probability of growth and predicted probabilities



(b) Share of fixed-term employees by firm size

Figure 12: Analysis for the period 2005-2019. Source: our elaborations on INPS data.

11. Appendix C - Employment Protection Legislation: Legal Framework and Reforms

11.1. Permanent contracts legislation

In Italy, the individual dismissal of an employee with an open-ended contract can occur for two main reasons[13]:

- Justified Objective Reasons: related to economic factors like company crisis or task elimination without reassignment possibilities.
- Justified Subjective Reasons: linked to employee misconduct.

Employees can challenge dismissals in court, with rules varying between small and large firms. In particular, the original Article 18 of the Labour Code (Statuto dei Lavoratori; Law n. 300/1970) established the following provisions:

- the "tutela reale" applies for large firms (> 15 employees): employees dismissed unfairly had the right to reinstatement and wage compensation for the period of litigation.
- the "tutela obbligatoria" applies for small firms (≤ 15 employees) : employers could choose between reinstatement or compensation for unlawful dismissals.[14]

In the 2010s different reforms to the EPL of permanent contracts occurred:

- Fornero Law (Law n. 92/2012): Limited reinstatement to discriminatory or blatantly unjustified dismissals; other cases saw compensation based on tenure (12–24 months' salary).
- Jobs Act (legislative decree n. 23/2015)[15]:
  - Introduced Contracts with Increasing Protections: Tenure-based compensation for unfair dismissals.
  - Standardized monetary compensation with caps, retaining reinstatement for discriminatory dismissals only.
  - Applied new rules to new hires, maintaining previous rights for existing employees.
- 2015 Budget Law: Offered hiring subsidies for open-ended contracts and conversions of fixed-term to permanent contracts.[16]

[13] A different type of dismissal that can be used, under certain circumstances, by firms with more than 15 employees are the collective dismissals, in which more than 5 layoffs occur within a 120-day period. In any event, the dismissals must be linked to the reduction or conversion of production activity or to a single process of work reorganisation within the enterprise which results in a surplus of employees. This process must also be triggered by a decision to close down the business. In these cases, the employer must follow a specific union procedure, which does not allow him to identify surplus workers freely. In fact, the identification criteria laid down in the union agreement or, in the absence of an agreement, subsidiarily provided for by law, must be respected.

[14] The regulation of dismissals for small firms changed with the Law n. 108/1990, which introduced severance payments of between 2.5 and 6 months pay for unfair dismissals in firms with fewer than 15 employees.Before Law n. 66/1966 provided that small firms were completely exempt from paying a compensation.

[15] The provisions only apply to the private sector, not affecting those employed by the public administration. The new dismissal procedures are valid for new permanent hires as of 7th March 2015, while the old form of permanent contracts is protected by existing rights.

[16] Employers were exempted from paying social security contributions up to a cap of 8,060 euros per worker per year for the first three years of employment. To prevent opportunistic behaviour by employers, this subsidy excluded workers who had held an open-ended contract in the previous six months or with the same firm in the three months before December 2014. The hiring subsidy was uniformly applied to both larger and smaller firms, with no firm size threshold associated with the policy.

11.2. Fixed-term contracts legislation

In the 1990s, Italy's labour market experienced an increasing segmentation with the introduction of flexible "atypical" contracts (e.g., agency work, job on call, contracts on professional projects) through the Treu Package (1997) and the Biagi Law (2003). These contracts offered businesses greater flexibility but lacked social security contributions, maternity or sick leave, and unemployment benefits. This created a dual labour market, where permanent employees retained strong protections, while new entrants faced increased precarity and reduced rights.

Since then, the Italian labour market has undergone several reforms aimed at regulating fixed-term contracts and improving job security:

- Fornero Reform (2012): Limited duration, renewals, and introduced mandatory break periods between consecutive fixed-term contracts.
- Poletti Decree (2014):
  - Allowed up to 8 renewals within a maximum of 36 months.
  - Removed the need to justify ("causalità") temporary contracts.
  - Capped fixed-term contracts to 20% of the permanent workforce in firms with > 5 employees.
- Jobs Act (2015): Simplified contract rules, abolished some atypical contracts, and reduced allowable renewals to 5 within 36 months.
- Decreto Dignità (2018): Reintroduced justification for renewals exceeding 12 months. Reduced renewals to 4 and added a 0.5% contribution increase per renewal.

11.3. EPL during the COVID-19 pandemic and recent developments

During the pandemic crisis, Italy implemented a freeze on individual dismissals for economic reasons and on collective dismissal procedures (Decree Law 18/20, the 'Cure Italy' decree) to protect workers from being laid off during the economic downturn. This measure introduced in March 2020 was extended several times as the pandemic persisted and definitively removed by the December 2021. In particular, since August 2020 the constraints were at first relaxed for companies that close down (Decree Law 104/2020, the 'August Decree'). From July 2021 the ban was lifted starting for the construction and industrial sectors (except for textiles, clothing, and footwear) and from November 2021, for other sectors. According to DL 73/2021 (the "Sostegni-bis" decree), the ban remained in effect until December 31, 2021, only for companies making use of emergency wage integration schemes.

More recently, the application of the attenuated reinstatement protection has raised questions, especially regarding the protection of workers in cases of dismissal for objective or disciplinary reasons. In particular, with the ruling n. 128 of 2024, the Constitutional Court has ruled that the attenuated reinstatement protection must also be applied in cases of dismissal for objective reasons when the material fact cited by the employer proves to be unfounded. In practice, if a worker is dismissed for economic or organizational reasons and it is demonstrated that such reasons do not exist, the worker is entitled to reinstatement in their position. Furthermore, the Court clarified that, in these circumstances, the possibility of redeploying the worker within the company, known as 'repêchage,' should not be considered. This is a crucial aspect as it removes one of the justifications employers might use to legitimize the dismissal.

By contrast, with judgment n. 129 of 2024, the Court deemed unfounded the issue raised regarding reinstatement protection in cases of worker non-compliance, when the collective bargaining agreement provides only for corrective sanctions. The Court provided an interpretative ruling, stating that the protection must also be applied in these situations, respecting the principle of proportionality. In practice, this means that if a worker is dismissed for a violation that, according to the collective agreement, should only result in a corrective sanction, the worker is entitled to reinstatement with attenuated protection.

Table 10: Comparison of Regulations and Compensation for Unfair Dismissal Across Different Laws

Law	**Regulation in case of unlawful dismissal**	**Compensation for unfair dismissal**
Law 66/1966	Employers had the choice of either reinstating workers or paying severance compensation, which depended on tenure and firm size.	In firms with more than 60 employees ranged between: • 5 and 8 months for workers with less than two and a half years of tenure; • 5 and 12 months for those between two and a half and 20 years of tenure; • 5 and 14 months for workers with more than 20 years of tenure. Firms with fewer than 60 employees had to pay half the severance paid by firms with more than 60 employees. Firms with fewer than 35 workers were completely exempt.
Law 300/1970 (Statuto dei lavoratori)	Firms with more than 15 employees had to reinstate workers and pay their foregone wages in the case of unfair dismissals. Firms with fewer than 15 employees remained exempt.	Firms with more than 15 employees: payment of foregone wages from the dismissal date to the reinstatement date. Firms with up to 15 employees: exempt.
Law 108/1990	Introduction of severance payments in firms with fewer than 15 employees. Firms with more than 15 employees: unchanged.	Firms with fewer than 15 employees: between 2.5 and 6 months' pay. Firms with more than 15 employees: unchanged.

Table 10: (continued)

Law	Regulation in case of unlawful dismissal	Compensation for unfair dismissal
The Fornero Law (Law n. 92/2012)	Firms with more than 15 employees: • Reinstatement (or substitution benefit equivalent to 15 months' standard wage) in case of: discriminatory dismissals; economic dismissals; disciplinary dismissals with no existing circumstances. • Compensation: disciplinary dismissals with existing circumstances; ineffective for formal violation. Firms with up to 15 employees: unchanged.	Firms with more than 15 employees: • Reimbursements in case of reinstatement: – Discriminatory dismissals: not lower than 5 months' standard wage; – Economic dismissals and disciplinary dismissals (with no fault): not higher than 12 months' compensation. • Compensation for disciplinary dismissals with fault: between 12 and 24 months of standard wage. Firms with up to 15 employees: unchanged.
The Jobs Act (legislative decree n. 23/2015)	Firms with more than 15 employees: • Reinstatement (or substitution benefit equivalent to 15 months' standard wage) in case of: discriminatory dismissals; disciplinary dismissals with no existing circumstances. • Compensation: economic dismissals; disciplinary dismissals with existing circumstances; ineffective for formal violation. Firms with up to 15 employees: unchanged.	Firms with more than 15 employees: • Reimbursements in case of reinstatement: – Discriminatory dismissals: unchanged; – Disciplinary dismissals (with no fault): unchanged. • Compensation: – Economic dismissals and disciplinary dismissals with fault: equal to 2 months' standard wages per year of service, with a minimum of 4 and a maximum of 24 months. Firms with up to 15 employees: unchanged.