The Effects of Employment Protection: Learning from Variable Enforcement*

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Abstract

Employment protection regulations are not enforced uniformly across the board. There are a number of exemptions to the coverage of these provisions: firms below a given threshold scale and workers with fixed-term contracts or involved in temporary agency work are outside the domain of application of some restrictive stipulations. This allow to make inferences on the impact of these regulations which go beyond the usual cross-country approach. In this paper we develop a simple model which explains why these exemptions in the implementation of employment protection conditioned on firm size are present in many countries to start with. We also obtain some results pointing to a significant firm's size threshold effect on the probability that workers with open-ended employment contracts are involved in layoffs, which we relate to exemptions of employment protection legislation for small firms.

1. Introduction

The purpose of this paper is to provide new evidence on the relationship between strictness of the employment protection legislation (EPL) and the incidence of

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job losses. Unlike previous studies assessing the effects of employment protection against cross-country data, in this paper inferences are made by exploiting the within country variation in the enforcement of EPL. In particular, individual countries' regulations typically allow for a threshold scale (generally defined in terms of the number of employees) below which either the most restrictive EPL regulations (e.g., the compulsory reintegration in case of unjustified dismissal) are not enforced, the legal procedures for firings are eased, or severance payments are diminished. Our goals with this paper are threefold: i) to develop a simple theoretical model to illustrate the sources of firing costs differences between small and large firms, ii) to explain why it may be reasonable to condition the implementation of EPL by firm size, and iii) to provide some empirical (but preliminary evidence) on threshold size effects regarding dismissals from LFS data regarding Italy and Spain. For this latter goal, we also use the presence of contractual types, like fixed-term contracts, which are not covered by employment protection, to infer whether the observed threshold scale effects can be actually attributed to EPL.

The advantage of our approach vis-a-vis the cross-country literature is that it disentangles the effects of EPL *per se* from the effects of EPL when interacted with other institutional features. Theoretical work – i.e., [3], and [9] – suggests that the effects of EPL on labour market performance are closely related to the presence of other institutional features, such as wage compression induced by the coverage of collective bargaining and the presence of statutory minimum wages, and the spread of early retirement and other "soft" landing schemes as well as the coverage of the insurance against job loss provided by unemployment benefit systems. This questions many of the results of the empirical literature on EPL ([4], [8] and [11]) which are based on cross-country (and often pairwise) correlations of indicators of the strictness of employment protection with variables measuring the behaviour of labour markets. Neither it is possible within a cross-country multivariate regression framework to take into account of all the different institutional interactions, owing not only to the very few degrees of freedom available (there are no time-series for many institutional features), but also to measurement problems, which are particularly serious having to do mainly with country rankings of different institutional features developed out of qualitative information.

The fact of working on data referred to the same country reduces these problems given that the different institutional features interacting with EPL are invariant across the different observations or, at least, do not have the same cross-section variation than EPL. We exploit here the fact that enforcement varies within a

country, due to the presence of exemptions to small firms from the implementation of EPL.

Our approach is to model first the exemptions and EPL rules, and then develop accordingly our empirical framework. The model tries to understand why the exception is in place to start with, and also cope with the fact that exemptions are defined over factors (e.g., the number of employees) that employers can alter at will. To do this, we need to extend the standard models of adjustment costs for labour used by most of the EPL literature. The exemptions based on threshold employment levels are rationalised in our model as the byproduct of the better capacity of small units to monitor workers' effort and, on the other hand, the fact that fixed, red-tape costs of dismissal regulations penalise small units. To keep things simple we will instead rule out adverse selection and assume that workers are assumed to be homogenous, so that in equilibrium there is no-shirking.

Our main results can be summarised as follows. From a theoretical perspective, EPL has ambiguous effects on wages: on the one hand, employment protection reduces the likelihood of exogenous (economic) layoffs thereby moderating wages (by increasing the penalty associated with the fact of being caught while shirking); on the other hand, EPL makes it difficult also to dismiss undisciplined workers, and this reduces the credibility of the threat of dismissal for those shirking, forcing employers to pay higher wages in order to discourage workers from shirking. The first effect tends to dominate in large units, that find it difficult, in any event, to monitor workers' productivity, while the wage enhancing effect dominates in small organisations that can well monitor workers' performance. Thus, a threshold scale may play the role of reducing this asymmetric and disfunctional effect of EPL on wages of small units. However, threshold scales in the enforcement of EPL reduce also incentives for firms to grow when demand conditions are favourable. Firms tend to cluster at two scales: small units and very large firms.[1]

Empirically, we show that EPL does reduce indeed the likelihood of layoffs. In Italy, where there is a threshold size (15 employees) below which some EPL regulations are not enforced, it is more difficult, ceteris paribus, for a worker to be laid-off if formerly employed in a firm with more than 15 employees than if employed in a very small unit. The dummy variable capturing the 15 employees threshold is always significant and signed in line with the predictions of the theoretical model. We try also with alternative (higher) threshold scales to control whether our dummy variable is capturing simply firm-size workers turnover effects. These additional dummy variables tend not to be statistically significant.

[1]Some evidence in this regard for Italian firms is provided by [5].

In Spain, where there are not thresholds to enforce EPL but different formal procedures are imposed depending on the cause alleged for the dismissal and severance payments may be lower for small firms, layoffs probabilities are higher in small firms for disciplinary dismissals, while lower in the case of economic dismissals. To test the robustness of our results we compare the estimated layoff probabilities with the probability of having a temporary contracts renewed. Workers under temporary contracts are not covered by standard EPL, independently of the firm's size. Encouragingly enough, in this case the threshold scale dummy variable turns out not to be statistically significant in Italy, while in Spain workers in firms over 50 employees under fixed term contracts are more likely to have its contract renewed than in small and medium size firms (10-49 employees), which suggests that firm size dummies in the probit regressions for layoffs probabilities are measuring something else that mere differences in either job turnover or wages between firms of different size.

The plan is as follows. Section 2 reviews the literature. Section 3 provides details on exemptions from EPL in Italy and Spain, focusing mainly on the presence of threshold scales below which EPL is either not implemented or implemented under different rules. Section 4 develops a simple model allowing to isolate other factors which may alter the effect of EPL on dismissals and hiring of temporary workers depending on firm size. Section 5 describes the data and displays our estimates. Finally, Section 6 concludes.

2. (Cross-country) Empirical Ambiguities

Table 2.1 reviews the empirical literature on the effects of EPL on the labour market. As shown by the Table a few studies found significant effects of employment protection (generally measured using the OECD cross-country ranking) on employment and unemployment stocks, while a common finding of this literature is that EPL negatively affects unemployment inflows and outflows. No unambiguous result is obtained concerning the impact of EPL on labour and job turnover, while theory unambiguously predicts a negative effect of the strictness of employment protection on this type of labour market flows. Explanations of this discrepancy between theory and facts – e.g., [3] and [4] – typically calls into play the interaction of EPL with other institutional features as well as measurement problems. For instance, it is argued that institutions compressing wage structures tend to counteract the negative effects of EPL on labour market flows because they reduce the scope of price-driven adjustment mechanisms. These potential interactions with

other institutional features question the relevance of many findings, which are all based on pairwise correlations. Measurement problems stem from the fact that there is a quite substantial within country variation in the actual enforcement of regulations, which is not captured by cross-country analyses.

¿From the above it follows that empirical work should preferably use data referred to the same country and exploit any time-series available in regulations. Unfortunately, no reform of EPL was carried out on a stock basis, adjusting regulations for all workers with regular contracts. The type of reforms of EPL which have been carried out have only been enforced at the margin, adding new flexible contractual types to the existing "rigid" ones. This type of asymmetric reforms yields dual labour market regimes in which a flexible segment of the workforce coexists with a rigid one. Contrasting the behaviour of the two segments is not sufficient to identify the effects of EPL because there are rather obvious links between the two components of the workforce, which have been investigated by the literature. In particular, [1] argue that flexible contracts provide a buffer stock to firms, which insulates permanent workers from employment adjustment in response to exogenous shocks. Studying the effects of EPL under dual regimes may then induce one to overstate the impact of these regulations.

3. (Within-country) Variable Enforcement

EPL regulations often envisage exemptions which are conditioned on firm size. First, many countries have granted to small firms exemptions from procedural obligations and, more broadly, from the most restrictive features of EPL. Secondly, in most countries EPL regulations distinguish between collective and individual firings. While collective dismissals can only be justified by economic reasons, individual firings can be justified either by economic or disciplinary reasons. The procedure and severance payments involved in collective dismissals are usually different from those involved in individual firings. Collective dismissals usually require a long consultation period with workers representatives and, in some countries, administrative approval which is very unlikely to be conceded in case of disagreement between the employer and workers representatives. In most cases, when agreement is achieved and the administrative approval conceded, severance payments are significantly increased above those established by the legislation. In the case of individual firings severance payments depend on the judicial ruling on the justification of the firing. In both cases (collective dismissals and individual firings) there may be sizeable red tape costs. This suggests that large firms are

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	EMPLOYMENT	UNEMPLOYMENT	EMPLOYMENT	UNEMPLOYMENT
Emerson (1998)	?	?	-	-
Lazear (1990)	-	+		
Bertola (1990)	?	?		
Grubb and Wells (1993)	-			
Garibaldi Konings and Pissarides (1994)	?	?	?	-
Addison and Grosso (1996)	?	?		
Jackman Layard and Nickell (1996)	?	?	-	-
Gregg and Manning (1997)	?	?		-
Boeri (1998)	?	?	+	-
Di Tella and MacCulloch (1998)	-	+		
OECD (1999)	?	?	?	-
Kugler and St.Paul (2000)			+	-

Figure 2.1: Some empirical evidence on EPL from cross-country studies

most likely to use collective dismissals justified by economic reasons, while small firms may find easier to justify disciplinary firings. Finally, large firms often benefit from regulations on group layoffs which reduce dismissal costs for employers, by allowing workers involved to have access to unemployment insurance schemes under more generous terms or to be put on "soft landing schemes" ending in a retirement plan.

One of the most convincing rationales for exempting, in countries like Germany and Italy, small units from the domain of application of the strictest EPL rules (e.g., the obligation to reinstate the employee who was found to be unfairly dismissed) is that employment protection tends to reduce one of the main advantages of small units vis-a-vis large firms, that is, the possibility to extract effort from workers without necessarily requiring a premia over the competitive wage. The rationale for conditioning formal procedures for dismissals on firm's size is that procedural obligations are a source of fixed costs, rather than being proportional to the number of workers involved in redundancies. Another reason is that small firms do not have an internal labour market to draw upon. But before developing formally the rationale for conditioning EPL regulations on firms' size we turn to describe EPL regulations in Italy and Spain, the two countries covered by our data.

3.1. Italian EPL exemptions: the 15 workers threshold scale

Individual, no-fault, dismissals of workers with a permanent contract are in Italy regulated by the norms of the Statuto dei Lavoratori, approved in 1970. The employer is required to give a written notice to the employee who can also require a communication of the detailed reasons for the dismissal and the start of a conciliation procedure by the provincial employment office or through conciliation committees set up under collective agreements. The length of the statutory notice period depends on the tenure of the worker. The worker can appeal to court against the dismissal within 60 days from the communication of the reasons of the dismissal, but has first to start a conciliation procedure with the firm. The size of firms matter in that the consequences of the judge's decision to overrule the firm's decision depend on the size of the firm. Workers in firms employing more than 15 employees in a single plant (or 60 overall) are protected by the so-called "tutela reale", that is, they can choose either the reinstatement in the firm, plus a compensation equal to foregone earnings between the date of the dismissal and the legal settlement of the case (with a minimum of 5 months), or a financial

compensation of 15 months and the foregone earnings. Workers in the smallest units are instead covered by the so-called "tutela obbligatoria" (L. 604/1966): in this case it is the employer to choose between reinstatement and a compensation ranging between 2,5 and 6 months depending on seniority and the size of the firm.

Thus, EPL on individual dismissals is much stricter for units with more than 15 employees. This asymmetric treatment of small and large units is partly compensated by the provisions concerning group layoffs, introduced in 1991 under the pressure of the European Commission. Collective dismissals concern firms with 15 or more employees laying-off 5 or more workers in a single production unit or within the same province. Under these norms, the employer is compelled to inform in advance the workers' councils (RSU or RSA) and the competent trade union ("associazione di categoria") about the reasons and the details of the dismissals (number of workers involved and professional position of the redundant workers as well as of the entire workforce), and to set up a joint examination committee. Moreover, the employer has to notify the dismissals to the labour administration (at the local, regional or national level depending on the size of the redundancy). The dismissals can be implemented only after an agreement is reached within the joint examination committee. Consultations take place on alternatives to redundancies, on the scope for redeploying the workers made redundant and on ways to mitigate the effects of dismissals. If no agreement is reached within 45 days of negotiations, a conciliation is attempted by the labour authority. If no agreement is reached after the second "round" of negotiations, the employer can then dismiss the redundant workers in agreement with the social and economic selection criteria specified by collective agreements or by the law (length of service, family burden, technical and production requirements - the law does not specifies priorities, but collective agreements usually do). However, in the absence of the agreement the employer has to pay a higher severance pay and it is more difficult that workers can benefit from soft landing schemes to retirement (like a combination of "Cassa Integrazioni Guadagni straordinaria" and so-called "Mobilità Lunga").

3.2. Spanish EPL Exemptions

In Spain EPL admits three causes for firings: i) Objective reasons (worker's incompetence, lack of adaptation to the job post, absenteeism, etc.), ii) Economic, technological, organisational or productive reasons, and iii) Disciplinary reasons (worker's unjustified absences, lack of discipline or subordination, etc.).

The formal procedure for dismissals is different depending on the alleged cause. For objective and economic layoffs there is a notice period of 30 days. At the moment of the dismissal the employer must give to the employee a written notice explaining the cause of the dismissal and a severance payment of 20 days' wages per year of seniority (with a maximum of 12 months' wages). Dismissed workers may appeal to court and the judge may declare the dismissal "fair", "unfair" or "null". If the dismissal is declared "fair", the worker keeps the severance payment. In case of dismissals due to economic, technological, organisational or productive reasons declared "fair" by the labour court in firms below 25 employees, a state fund (FOGASA) pays 40% of the corresponding severance payments.

For disciplinary firings there is no notice period. At the moment of the dismissal the employer must give to the employee a written notice explaining the cause of the dismissal but not the severance payment of 20 days' wages per year of seniority (with a maximum of 12 months' wages), as happens in dismissals under 1 and 2. The worker may appeal to court and the judge may declare the dismissal "fair", "unfair" or "null". If the dismissal is declared "fair" the worker leaves the firm without any severance payments.

For any type of dismissal, if declared "unfair" by the labour court, the employer can choose between reinstatement or paying a higher severance payment of 45 days' wages per year of seniority with a maximum of 42 month's wages (33 days' wages per year of seniority with a maximum of 24 month's wages under the new permanent contract introduced in 1997) together with the wages corresponding to the period between the date of the dismissal and the date of the court's decision. If the dismissal is declared "null", then the worker must be reinstated and the wages corresponding to the period between the date of the dismissal and that of the court's ruling must be paid.

Collective dismissals are defined as those justified by either economic, technological, organisational or productive reasons affecting over a period of 90 days at least to:

· 10 employees in firms below 100 employees.

· 10% of employees in firms between 100 and 300 employees

· 30 employees in firms with more than 300 employees.

In this case, the formal procedure is as follows. The employer must first ask approval to the administrative office in charge (usually under the Ministry of Employment or the Employment Office of regional governments). Simultaneously, the employer must open a consultation period with workers' representatives. The minimum duration of the consultation period is 30 days (15 days in firms below

50 employees). When the consultation period is over, the employer ought to communicate the results of the consultation to the administrative office, which then has 15 days to grant approval for the dismissals (in case of no response after 15 days, it is understood that the approval is granted). In practice, administrative approval is almost only granted in case of agreement between the employer and workers' representatives. Severance payments are then established in 20 days' wages per year of seniority, with a maximum of 12 months' wages (in practice, to achieve the agreement with workers' representatives, employers pay severance payments much higher than amount established by the legislation).

Notice that, as a result of the regulation of formal procedure, small firms (below 25 employees) have a better treatment for economic dismissals regarding severance payments, since they may get 40% of those as a subsidy from a state fund. However, regarding red tape costs, large firms are better treated as they can take advantage of collective dismissals. However, for disciplinary dismissals the same rules apply to all firms.

As for temporary work, Spain was one of the pioneer at liberalising fixed term contracts in 1984.[2] Up until 1994 fixed-term contracts could be used to hire workers, not only in seasonal, determined duration jobs, but also for "typical" jobs which do not usually have an expected date of termination. These contracts allow for dismissals, at the termination of the contract, at much lower costs (in some cases, even at zero costs) than those under permanent contracts, without needs of going through any judicial or administrative procedures. The proportion of fixed-term employees rose very fast in the second half of the 1980s to surpass 30% in the early 1990s. Along the 1990s there have been several labour market reforms restricting the scope of fixed-term employment contracts (in 1994 and 1997) and providing subsidies to the conversion of fixed-term employment contracts into permanent ones and to the hiring of employees under the latter (after 1997). As a result of the reforms, since 1994 fixed-term contracts can only be used, in principle, to hire workers for seasonal, determined duration jobs. However, the incidence of fixed-term employment has decreased only slightly and is still above 30%.

[2]For a recent survey on the effects of fixed-term employment in Spain, see [6].

4. A Simple Model of EPL, Size of Firms, and Temporary Work

Our theoretical framework is a simple, dynamic efficiency wage model, inspired on [12]. We distinguish between layoffs due to economic reasons and firings for disciplinary motives. Firm size is relevant, first, for monitoring and, hence, for the probability of being laid-off because of disciplinary reasons. Secondly, it is also relevant for the size of firing costs, since these are assumed to depend on the reasons for firings and on firm size.

We consider three type of adjustment costs for labour. First, employees found to be shirking receive just a severance payment, say either the notice period or the expected payoff from a court ruling on the fairness of the dismissal. Secondly, employees laid-off for economic reasons receive instead a larger severance payment. Finally, the firm, in addition to severance payments, has also to pay some fixed (procedural or legal) deadweight costs (red tape costs).

Given the firing provisions, workers choose effort, and firms determine wages to elicit effort from the workers.[3] We first solve for the worker's effort decision, then the firm's employment decision, and, finally, we characterise layoff probabilities for workers in firms of different size.

4.1. *Workers*

All workers are alike. Their utility is linear in earnings and effort, namely

$$u_t = w_t - e_t \tag{4.1}$$

where w is the wage and e is effort, which, for simplicity, is assumed to be a discrete variable ($e = 0, 1$). If the worker chooses to exert effort, its value function is given by

$$V_t^{ns} = w_t - e_t + \delta[(1 - p_t^{ns})E_t V_{t+1} + p_t^{ns}(U_{t+1} + z^{ns})] \tag{4.2}$$

[3]There is an additional firm's decision which we do not analyse. This is the alleged cause of dismissals, whether economic or disciplinary. As mentioned in section 2, this may imply different severance payments and red tape costs depending on the procedures. For an analysis of this decision, see [7].

where p_t^{ns} is the layoff probability when the worker is exerting effort (thus, it is the probability of being dismissed because of economic reasons), z^{ns} is the severance payment received by the worker in this case, δ is the discount factor and U_t is the asset value of unemployment, which, in turn, is equal to

$$U_t = b + \delta[\rho_t E_t V_{t+1} + (1 - \rho_t) U_{t+1}] \tag{4.3}$$

being b unemployment benefits and ρ the outflow probability from unemployment into employment (initially considered constant, so that U is constant as well as independent of the reasons of the previous dismissal).

The asset value of being employed and shirking is given by

$$V_t^s = w_t + \delta[(1 - p_t^s) E_t V_{t+1} + p_t^s (U_{t+1} + z^s)] \tag{4.4}$$

where $p_t^s > p_t^{ns}$ is the probability of being laid-off if *not* exerting effort, and z^s is the severance payment received by the worker in case of disciplinary layoff (if found not exerting effort).[4]

Let $0 < d \leq 1$ be the probability of being caught shirking (the detection probability). Hence, we have:

$$p_t^s = p_t^{ns} + (1 - p_t^{ns}) d \tag{4.5}$$

The size of firms affects d, that is, $d = d(l)$ where l is the number of employees in the firm. In particular, we will assume that $d(1) = 1$ so that no self-employed shirks, and $d' < 0$ and $d'' < 0$. In words, in large firms monitoring is more (and increasingly) difficult. This parameter will also be used later to characterise asymmetries in employment protection across small and large units. Firm's size may also affect z^{ns} and z^s, if, as in the Italian case, small firms are exempted from some regulations imposing higher several payments (as it is the case with the reinstatement clause), or, as in the Spanish case, firings go through different procedures which imply different costs depending on firm's size.

The no-shirking condition ($V_t^{ns} = V_t^s$) for a worker is implicitly given[5] by

[4] Conceivably, $z^{ns} > z^s$. Both in Italy and in Spain the severance payments in case of unfair dismissals are the same for economic and disciplinary firings. However, they are higher for "fair" economic dismissals than for "fair" disciplinary dismissals (bieng nil in the latter case).

[5] Both for a shirker and a non-shirker we have that $E_t V_{t+1} = \max(E_t V_{t+1}^s, E_t V_{t+1}^{ns})$. Since workers are homogeneous $E_t V_{t+1}$ should be independent of the decision at t, provided that there is infinite horizon and there is no serial correlation in the parameters conditioned on decisions at t. The detection probability is an exogenous parameter our model, which does not depend on the worker's past shirking behaviour.

$$E_t V_{t+1} = U_{t+1} + \frac{1}{\delta(p_t^s - p_t^{ns})} + \frac{p_t^s z^s - p_t^{ns} z^{ns}}{p_t^s - p_t^{ns}} \tag{4.6}$$

In words, the expected value of being employed is equal to the sum of the value of being unemployed plus the expected present value of the cost of exerting effort, plus the expected severance payments in case of dismissal. Using (4.5), we can write:

$$E_t V_{t+1} = U_{t+1} + \frac{1 + \delta\,(p_t^s z^s - p_t^{ns} z^{ns})}{\delta\, d(1 - p_t^{ns})} = U_{t+1} + z^s + \frac{1 - \delta p_t^{ns}(z^{ns} - z^s)}{\delta\, d(1 - p_t^{ns})} \tag{4.7}$$

Now, using equations [4.4] and [4.7], we solve for the wage to obtain[6]:

$$E_t w_{t+1} = (1-\delta)(U + z^s) + \frac{[1 - \delta(1-d)(1-p_t^{ns})][1 - \delta p_t^{ns}(z^{ns} - z^s)]}{\delta\, d(1 - p_t^{ns})} \tag{4.8}$$

This expression highlights three channels through which firm's size affects wages. First, the second term of the right-hand side, is decreasing in d. Thus, being the detection probability decreasing in size, large firms pay higher wages. This is the standard result in the efficiency wage literature under which a lower detection probability has to be compensated by higher wages, so that the shirking worker faces larger penalties from being fired.

Moreover, this same term is also decreasing in z^{ns} and increasing in z^s, and these severance payments, both in the case of economic and disciplinary layoffs, may vary across firms of different size. This variation may be due to either EPL exemptions conditioned on firm's size or to procedural regulations for dismissals, which affect severance payments and may also apply differently to firms of different sizes. It is conceivable that z^s is decreasing in firm's size, since small firms may find easier to prove the "fairness" of disciplinary firings at the labour court and, hence, pay lower severance payments. Additionally, the exemptions to EPL conditioned

[6] In addition to the no-shirking condition, the value of being employed and exerting effort should exceed the value of being unemployed, so that wages must also satisfy

$$w_t > b + e - \delta(1 - \rho - p_t^{ns})(E_t V_{t+1} - U) - \delta p_t^{ns} z^{ns}$$

By appropriate choice of b, we can make sure that this is not binding.

on firings typically affect severance payments in case of economic dismissals, not in case of disciplinary dismissals, so that it is also conceivable that $z^{ns} - z^s$ is decreasing in firm's size. Thus, small firms pay lower wages.

This does not mean that EPL will always combine the three types of effects described above. Depending on the nature of the firm and workers, that is, depending on the quality of the match, EPL will act mainly as a deterrent to disciplinary dismissals rather than as an obstacle to economic layoffs. In particular, the model above suggests that EPL will exert its wage enhancing effects mainly in the case of small units, as large firms find it hard, in any event, to monitor the performance of their workers. Thus, equation (4.8) implies the following propositions:

Proposition 1: For any given statutory severance pay levels, z^{ns} and z^s, so that (z^{ns} - z^s) is fixed across firms of different size, then wages are increasing (and convex) in the size of firms.

Proof: This follows from the NS condition. For given z^{ns} and z^s firm's size only affects wages via the detection probability:

$$\frac{\partial E_t w_{t+1}}{\partial l} = -\frac{[1-\delta p_t^{ns}(z^{ns}-z^s)][1-\delta(1-p_t^{ns})]d'}{\delta(1-p_t^{ns})d^2} > 0$$

while:

$$\frac{\partial^2 E_t w_{t+1}}{\partial l^2} = -\frac{[1-\delta p_t^{ns}(z^{ns}-z^s)][1-\delta(1-p_t^{ns})]}{\delta(1-p_t^{ns})}\frac{d''d-2(d')^2}{d^3} > 0$$

In the remainder, we will denote by $w(l)$ the (endogenous) wage equations satisfying the non-shirking condition (4.8).

Corollary: If wages and z^s are fixed, i.e. by collective wage agreements, then the severance payment received by workers laid-off because of economic reasons, z^{ns}, is increasing (and convex) in the size of firms.

Proof: Consider once more (4.8) and solve it this time for z^{ns} holding w and z^s constant to obtain:

$$z^{ns} = z^s + \frac{1}{\delta p^{ns}} + \frac{d(1-\delta)(1-p^{ns})(U+z^s)}{p^{ns}[1-\delta(1-d)(1-p^{ns})]} - \frac{d(1-p^{ns})w}{p^{ns}[1-\delta(1-d)(1-p^{ns})]}$$

Severance payments in case of economic dismissals, is after all, a component of the remuneration of workers. Hence, employers may either adjust wages to different levels of monitoring or they may simply increase the difference between the

payoffs from economic and disciplinary reasons. The relation between severance pay and (efficiency) wages is also established by the following proposition:

Proposition 2: Per any given z^s, wages are decreasing in z^{ns}.

Proof: Consider once more (4.8) and differentiate it with respect to z^{ns} holding z^s constant to obtain:

$$\left[\frac{\partial E_t w_{t+1}}{\partial z^{ns}}\right] = -\frac{[1-\delta(1-d)(1-p_t^{ns})]\, p_t^{ns}}{d(1-p_t^{ns})} < 0$$

In words, higher severance pay in case of economic layoffs involves lower wages. This result is line with Lazear's [10] in that the effects of EPL involving just transfers from the employer to the worker can be *partly* undone by discounts on wages.

Another property of this model (shared with the efficiency wage literature) is that wages are increasing (and convex!) in the exogenous (for the worker) layoff probability of workers exerting effort, p_t^{ns}. It is illustrative to focus on the case of static expectations ($V_t = V_{t+1} = V$), where, from equation (4.8)

$$w = (1-\delta)U + \frac{[1-\delta(1-d)(1-p^{ns})]}{\delta d(1-p^{ns})} \tag{4.9}$$

where, for simplicity, we have assumed $z^s = z^{ns} = 0$. In the case of very small units (for d approaching one unit), equation (4.9) reduces to:

$$w = \frac{1}{\delta(1-p^{ns})} + (1-\delta)U$$

so that w is increasing and convex in p^{ns}. This result also applies to $d < 1, .$as can be seen by direct derivation of equation [4.9].

4.2. *Firms*

Firms are indexed by the subscript i. They all produce using labour as the only input. Their instantaneous profits are given by:

$$\pi_{it} = \theta_t \; f_i(\, l_t) \; - l_t w(l_t) \;\text{ where } f' > 0, f'' < 0$$

being θ the market value of the good observable by the employer. We assume that the evolution of prices is a first order, discrete space, Markov process. Suppose, in

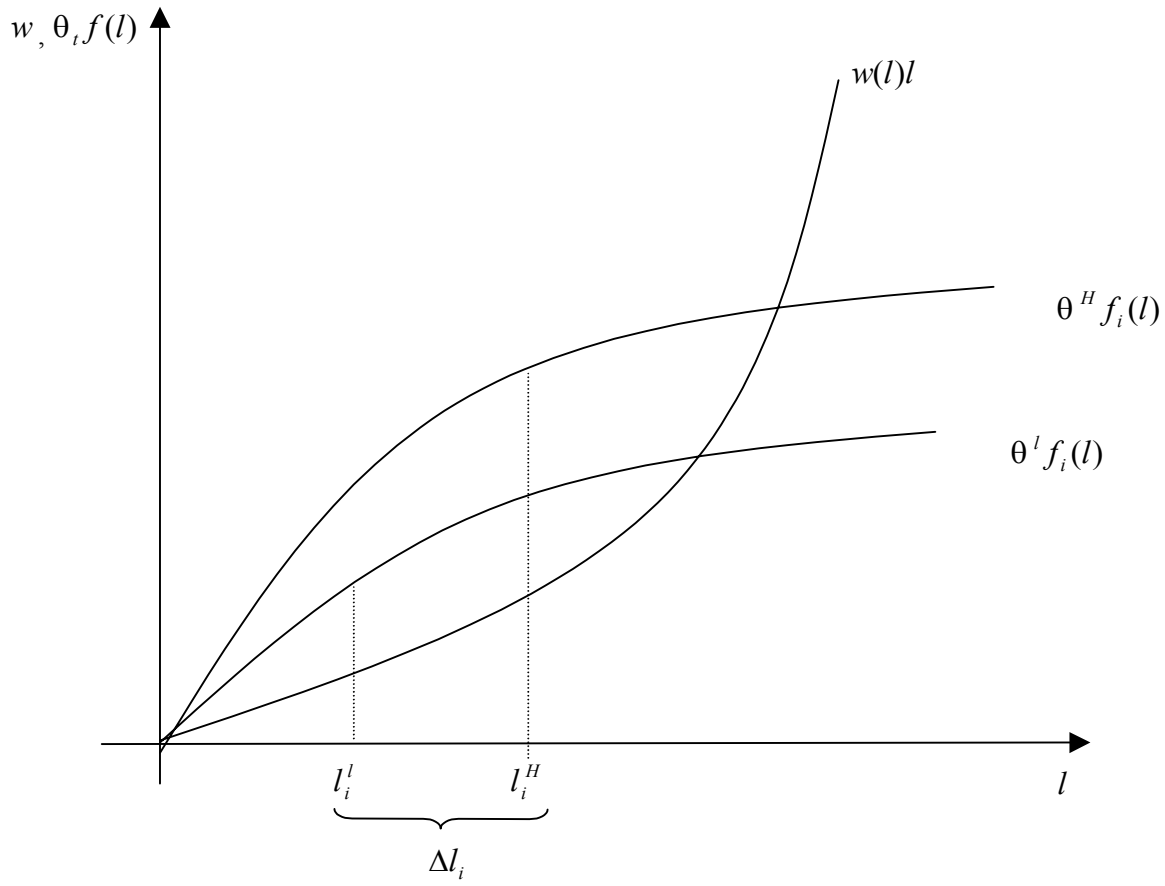


Figure 4.1: Optimal employment levels under different realisations of θ

particular, that there are just two states, "high", θ^h, and "low" $\theta^l < \theta^h$, and that the transition matrix is symmetric and its stayer coefficients are given by $\lambda > \frac{1}{2}$ so that there is some degree of persistence.

Due to the concavity of production technologies and the convexity of the wage function in labour, we will have unique optimal employment levels for each state of the world as shown in figure 4.1. Denote by l_i^h and l_i^l the employment levels which maximise the value of firm i when the states of the world are θ^h and θ^l respectively. Notice that under our assumptions, the firing probabilities for non-shirking workers in the two states are $p_h^{ns} = 0$ and $p_l^{ns} = (1-\lambda)\frac{l_i^h - l_i^l}{l_i^h}$.[7] Hence, from the profit maximization condition:

$$\theta^l \; f_i'(\, l^l) \; = (1-\delta)(U + z^s) + \frac{1-\delta(1-d)}{\delta\, d} - \frac{(1-\delta)d'}{\delta d^2} l^l \tag{4.10}$$

$$\begin{aligned} \theta^h \; f_i'(\, l^h) \quad = \quad & (1-\delta)(U+z^s) + \qquad (4.11) \\ & + \frac{\{1-\delta(1-d)[1-(1-\lambda)\frac{l_i^h - l_i^l}{l_i^h})]\}[1-\delta(1-\lambda)\frac{l_i^h - l_i^l}{l_i^h}(z^{ns}-z^s)]}{\delta\, d[1-(1-\lambda)\frac{l_i^h - l_i^l}{l_i^H}]} - \\ & - \frac{[1-\delta(1-\lambda)\frac{l_i^h - l_i^l}{l_i^h}(z^{ns}-z^s)]\{1-\delta[1-(1-\lambda)\frac{l_i^h - l_i^l}{l_i^h}]\}d'}{\delta[1-(1-\lambda)\frac{l_i^h - l_i^l}{l_i^h}]d^2} l^h \qquad (4.12) \end{aligned}$$

Thus, the difference $(l_i^h - \, l_i^l) \equiv \Delta l_i$ will depend on the size of severance payments, and possibly other regulations concerning dismissals, together with the detection probability (d) and the parameters determining the Markov process for firm's profitability (θ^h, θ^l, and λ). Per given regulations, it will depend on the production technologies of the firm. As the firm is more productive, the difference between optimal employment levels in high and low states is larger since access to more efficient technologies yields a shift outwards of the revenue function of the firm. There are also some other comparative statics results that follow immediately from the properties of $w(l)$ discussed in the previous section:

- Δl_i is increasing in z^{ns} and decreasing z^s. This follows from the fact the wage in the high state is decreasing in z^{ns}, while both $w(l)$ and $w\prime(l)$ are increasing in z^s. Thus, treating disciplinary firings as economic layoffs decreases

[7] Under the assumptions of a Markov process for firm's profitability and an infinite horizon, the value of being unemployed is constant.

employment in the high state. In the extreme case in which $z^{ns} = z^s$:

$$\theta^h \; f_i'(\, l^h) \; - \theta^l \; f_i'(\, l^l) \;\; = \;\; \frac{(1-\lambda)^{\frac{l_i^h - l_i^l}{l_i^h}}}{\delta \, d[1-(1-\lambda)^{\frac{l_i^h - l_i^l}{l_i^h}}]} - \frac{(1-\delta)d'}{\delta d^2}(l^h - l^l) - \\ - \frac{(1-\lambda)^{\frac{l_i^h - l_i^l}{l_i^h}} d'}{\delta d^2 [1-(1-\lambda)^{\frac{l_i^h - l_i^l}{l_i^h}}]} l^h$$

- Δl_i is decreasing in l_i^l. This follows from the wage being convex in l, which in turn is a consequence of assuming that the detection probability is decreasing and convex in firm's size. Thus, the larger the firm, the higher the difference between θ^h and θ^l required to achieve the same increase in employment from the low to the high state.

An advantage of the version of efficiency wage framework described above vis-a-vis adjustment cost and matching models is that it allows to disentangle the way in which EPL deters disciplinary layoffs from the obstacles it exerts on economic dismissals. While both, restrictions to disciplinary *and* economic layoffs reduce the responsiveness of employment to product market shocks, barriers to disciplinary layoffs (or firing costs for short) exert a different effect on wages than obstacles to economic dismissals. In particular, firing costs, by making less credible the job loss sanction applied to the shirkers, tend to increase efficiency wages, while dismissal costs tend to exert a moderating effect on wages because they reduce the probability of being dismissed for reasons independent of the performance of the individual worker. Thus, ceteris paribus, restrictions to disciplinary firings are much more costly to firms than obstacles to economic layoffs.

4.3. *Introducing red-tape costs: the rationale for regulations on group layoffs*

So far, we have modeled EPL only referring to severance payments. Employment protection regulations, however, do not involve only transfers from the employer to the worker being dismissed. Most frequently, red tape costs are imposed – in terms of procedural obstacles, union consultation and legal costs – which cannot be internalised in the employer-employee relationship . Such type of costs also arise from judicial procedures to be followed to implement dismissals. EPL usually establishes that either economic or disciplinary reasons have to be proved: firings

are indeed considered to be unfair in most countries when there are *neither* subjective (misconduct) nor objective (economic) grounds for the interruption of the relationship. As noted above, penalties applied to employers implementing unfair dismissals do not discriminate among the two types of justifications (disciplinary and economic) for the dismissal (see [2]). Proving the presence of economic reasons for the dismissals involves typically a fixed red–tape cost to the employer, while proving the presence of grounds for a disciplinary layoff is done on a case-by-case basis, and legal costs can be rebated by the winner on to the loser in the labour dispute. Regulations on *collective dismissals* or *group layoffs,* which are present in many OECD countries, further strengthen this fixed-cost nature of red-tape costs incurred in the case of economic dismissals.

4.4. *The rationale for the exemption of small firms*

In light of the above, we consider here only red-tape costs faced in case of economic dismissals and we model them as a fixed cost, F. Note that red tape costs can be as large as to discourage some firms from increasing employment even under the good state of the world. This happens when the dismissal cost makes it not convenient for employers to increase employment when a positive shock occurs, that is

$$\begin{aligned}&(1+\lambda)[\theta^h\, f_i(\, l^h) \,-l^h w(l^h)] + (1-\lambda)[\theta^l\, f_i(\, l^l) \,-l^l w(l^l) - (F + z^{ns}\Delta l_i)]\\ &< (1+\lambda)[\theta^h\, f_i(\, l^l) \,-l^l w(l^l)] + (1-\lambda)[\theta^l\, f_i(\, l^l) \,-l^l w(l^l)]\end{aligned}$$

When severance costs are negligible ($z^{ns} = 0$), this condition reduces to

$$\theta^h\,[f_i(\, l^h) - f_i(\, l^h)] - (l^h w(l^h) - l^l w(l^l)) < \frac{F}{1+\lambda}$$

Thus the firm will fall into an *inactivity region* where it is not convenient to adjust employment levels in response to shocks, whenever the difference $[\theta^h\, f_i(\, l^h) - l^h w(l_t^h)] - [\theta^l\, f_i(\, l^l) - l^l w(l^l)]$ is relatively contained. This is the case of small firms which experience relatively small variations in employment in response to shocks. The presence of threshold scale of plants below which firms are exempted from EPL regulations can find a rationale just in an attempt to avoid many firms falling into this inactivity region.

4.5. *Some simulations*

In order to provide some illustrative comparative statics from the previous model, we perform some simulations. For the production function we chose $f(l) = l^{\alpha}$, with $0 < \alpha < 1$. The detection technology is represented by $d(l) = 2 - l^{\beta}$ with $\beta > 1$. By appropriately choosing unemployment benefits (b), we can normalize $U = 1$. The cost of exerting effort (e) is also taken to be unity. Thus, for given δ, θ^l, and z^s, equation [4.10] can be solved for l^l. This, together with values for λ, θ^h, and z^{ns} yields l^h from equation [4.11].

Table 4.1 gives the results for several sets of parameter values. We report employment and wages in the two states of the world when there are no red tape costs for economic dismissals ($F = 0$) together with the minimum value of these red tape costs $\bar{F}$ which implies an invariant employment level across states. We perform these simulations to get some feeling about the impact of severance payments and red-tape costs on the inaction zone in which employment levels are invariant across states. Our main goal is to see to what extent parameters which may be different across firm's size are relevant in determining this zone. Thus, across the simulations we choose different values for the elasticity of output with respect to labour (α) and the degree of persistence of the states of nature (λ).

For severance payments, we choose seven regimes: i) no severance payments ($z^{ns} = z^s = 0$), ii) "low" severance payments in case of both economic dismissals and disciplinary layoffs ($z^{ns} = 0.5, z^s = 0.5$), iii) "high" severance payments in case of economic dismissals and "low" severance payments in case of disciplinary layoffs ($z^{ns} = 1, z^s = 0.5$), iv) "low" severance payments in case of economic dismissals and "high" severance payments in case of disciplinary layoffs ($z^{ns} = 0.5, z^s = 1$), v) "high" severance payments in both cases ($z^{ns} = z^s = 1$), vi) no severance payments in case of economic dismissals and "high " severance payments in case of disciplinary layoffs ($z^{ns} = 0, z^s = 1$), and vii) "high" severance payments in case of economic dismissals and no severance payments in case of disciplinary layoffs ($z^{ns} = 1, z^s = 0$).

Since the wage in the low state of nature (w^l) only depends on the severance payment in case of disciplinary dismissal and the supervision technology (z^s and $d(l)$), its value is invariant across the four panels of Table 4.1 which displays the simulation results for four cases: i) "low" elasticity of output with respect to labour and "low" degree of persistence ($\alpha = 0.5, \lambda = 0.5$), ii) "low" elasticity of output with respect to labour and "high" degree of persistence ($\alpha = 0.5, \lambda = 0.7$), iii) "high" elasticity of output with respect to labour and "low" degree of

persistence ($\alpha = 0.7, \lambda = 0.5$), and iv) "high" elasticity of output with respect to labour and "high" degree of persistence ($\alpha = 0.7, \lambda = 0.5$). The employment in the low state of nature (l^l) depends, additionally, on the elasticity of output with respect to labour, so that the higher this elasticity the lower the employment in the low state of nature is.

Our simulations consider regimes (sectors) with relatively small units and regimes with large firms. As the size of firms is endogenous in our model, small business sectors are those with a relatively high elasticity of output to employment (regimes iii) and iv), that is the bottom two panels of Table 4.1).Finally, the degree of persistence of the business cycle and severance payments in case of economic dismissals affect wages and employment in the high state of nature and, hence, to the critical level of red-tape costs which imply the same employment levels in both states.

The simulation results reported in Table 4.1 can be used to get some magnitude on the comparative statics effects we are interested in. Here are the key results:

- An increase of severance payments imposed in case of economic dismissals negatively affects employment levels only when it is accompanied with an increase in the costs of disciplinary layoffs. When only severance for economic dismissals is present, employment levels under the bad state of the world are unchanged and those under the good state may be even increasing. Significantly, this employment bias of severance is stronger in small business regimes: here it ranges between 15 and 30 per cent, depending on the value of parameters capturing the persistence of shocks, while for industries with large units the bias is *at most* of the order of 15 per cent;

- Costs imposed to employers in case of disciplinary layoffs always negatively affect employment, in whatever state of the world and regime. However, regimes with small units experience the largest employment losses.

- The responsiveness of optimal employment levels to changes in the state of the world $(l^h - l^l)/l^l$,is reduced in presence of severance costs, but only when they are extended to disciplinary layoffs: once more it is z^s which conditions the employment behaviour of firms, notably in small business regimes.

- The key factor behind the employment bias of severance on disciplinary layoffs is the wage premium associated with the no-shirking condition. Wages in small units are lower when there are no costs associated with disciplinary

layoffs while economic dismissals are costly. This makes the no-shirking condition holding at relatively low-wages. On the other hand, due to detection technologies, large units still have to pay a significant premium over the competitive wage in order to discourage shirking. Thus the wage differential between good and bad state of the world is larger when only economic dismissals are costly, notably in small business regimes.

- The critical level of red-tape costs (the level preventing firms to adjust employment levels when there are changes in cyclical conditions) is always larger in small business sectors than in industries with a low elasticity of output to employment. In presence of severance for disciplinary dismissals, it suffices a low F to prevent firms to grow or decline along the cycle. All this contributes to explaining why small units are typically exempted from red-tape costs: they may act as a barrier to the growth of these firms. If the exemption area is sufficiently large, however, then the employment growth bias of red-tape costs is significantly reduced.

Table 4.1. Simulation results

$f(l)=l^{2/3}, d(l)=2-l^{1.25}, \theta_l=1, \theta_h=3, U=e=1, \delta=0.95, \lambda=0.5$								
		$z^{ns}=0$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0$	$z^{ns}=1$
		$z^{s}=0$	$z^{s}=0.5$	$z^{s}=0.5$	$z^{s}=1$	$z^{s}=1$	$z^{s}=1$	$z^{s}=0$
$F=0$	l^l	0.234	0.219	0.219	0.205	0.205	0.205	0.234
	l^h	0.861	0.845	0.945	0.734	0.829	0.660	1.076
	w^l	1.079	1.103	1.103	1.128	1.128	1.128	1.079
	w^h	1.609	1.640	1.438	1.847	1.669	2.000	1.185
for $l^l=l^h$	$\bar{F}$	1.059	0.573	0.406	0.276	0.087	0.470	0.760
$f(l)=l^{2/3}, d(l)=2-l^{1.25}, \theta_l=1, \theta_h=3, U=e=1, \delta=0.95, \lambda=0.7$								
		$z^{ns}=0$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0$	$z^{ns}=1$
		$z^{s}=0$	$z^{s}=0.5$	$z^{s}=0.5$	$z^{s}=1$	$z^{s}=1$	$z^{s}=1$	$z^{s}=0$
$F=0$	l^l	0.234	0.219	0.219	0.205	0.205	0.205	0.234
	l^h	1.038	1.206	1.089	0.950	1.014	0.887	1.161
	w^l	1.079	1.103	1.103	1.128	1.128	1.128	1.079
	w^h	1.440	1.466	1.345	1.606	1.491	1.714	1.196
for $l^l=l^h$	$\bar{F}$	1.467	0.975	0.685	0.783	0.482	1.092	0.904
$f(l)=l^{3/4}, d(l)=2-l^{1.25}, \theta_l=1, \theta_h=3, U=e=1, \delta=0.95, \lambda=0.5$								
		$z^{ns}=0$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0$	$z^{ns}=1$
		$z^{s}=0$	$z^{s}=0.5$	$z^{s}=0.5$	$z^{s}=1$	$z^{s}=1$	$z^{s}=1$	$z^{s}=0$
$F=0$	l^l	0.231	0.211	0.211	0.194	0.194	0.194	0.231
	l^h	0.918	0.900	1.004	0.785	0.882	0.701	1.117
	w^l	1.079	1.103	1.103	1.128	1.128	1.128	1.079
	w^h	1.670	1.702	1.491	1.923	1.734	2.086	1.227
for $l^l=l^h$	$\bar{F}$	1.158	0.672	0.534	0.350	0.184	0.529	0.922
$f(l)=l^{3/4}, d(l)=2-l^{1.25}, \theta_l=1, \theta_h=3, U=e=1, \delta=0.95, \lambda=0.7$								
		$z^{ns}=0$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0.5$	$z^{ns}=1$	$z^{ns}=0$	$z^{ns}=1$
		$z^{s}=0$	$z^{s}=0.5$	$z^{s}=0.5$	$z^{s}=1$	$z^{s}=1$	$z^{s}=1$	$z^{s}=0$
$F=0$	l^l	0.231	0.211	0.211	0.194	0.194	0.194	0.231
	l^h	1.103	1.091	1.149	1.018	1.079	0.958	0.215
	w^l	1.079	1.103	1.103	1.128	1.128	1.128	1.079
	w^h	1.487	1.514	1.388	1.661	1.540	1.775	1.234
for $l^l=l^h$	$\bar{F}$	1.634	1.140	1.140	0.927	0.645	1.217	1.112

5. Empirical evidence

In this section we aim at providing some evidence that EPL conditions on firm's size have some consequences for flows from employment into unemployment. To achieve this, we have to disentangle the effects of EPL from the effects of wage differentials and from shocks of different sizes to labour demand on these flows. We mainly rely on three tests: i) threshold effects in firing rates at levels close to those implied by EPL exemptions, in the analysis of the Italian, ii) difference in firing rates under individual and collective dismissals for firms of difference size, in the analysis of Spanish evidence, and, iii) comparison of firing rates and the rates at which temporary contracts are not renewed in large and in small firms, in both Italy and Spain.

5.1. Data and Empirical Strategy

We use individual data on employment status from both Italian and Spanish data. From this, we can identify firings (in certain case, the causes alleged and the procedure followed for the dismissal), together with firm's size and some individual and firm's characteristics. We now describe some characteristics of the databases and the empirical strategy followed.

The Italian Labour Force Survey is a quarterly survey with a large rotating panel. At yearly frequencies, we can track histories of about 40 per cent of the LFS sample, that is, about 80,000 individuals. The size of the firm is stated by the employees. This gives rise to problems of "heaping"; indeed the distribution of the stated employment levels reveals marked peak at discrete intervals (e.g., 10 employees, 20 employees, etc.). In the empirical analysis below we use information from both, matched records across LFS waves (enabling us to identify separations) as well as contemporaneous and retrospective information in the initial and the final period respectively (allowing us to measure the size of the firm the worker was attached to and the nature of the separations). Unfortunately the information provided by the survey is not sufficient to disentangle disciplinary from economic layoffs.

The Spanish Labour Force Survey is also a household panel survey with a rotation scheme. Each household is interviewed during six consecutive quarters, with one sixth of the sample entering and exiting the survey every quarter. Hence, as in the Italian LFS the size of the firm is stated by the employees and the "heaping" problem also applies. Since 1992 employees are requested to answer the number of employees of their firms, but, unfortunately for our purpose, the

response is coded in four classes (less than 10 employees, 10-19 employees, 20-49 employees, and 50 or more employees). Hence, we can construct flows from employment into unemployment controlling for firm size in the last employment spell. Moreover, unemployed workers with a previous employment spell are asked about the reason why they lost their last job (quit, collective layoff, individual layoff, not renewal of fixed-term contract, etc.). Unfortunately, in the case of individual firings, the LFS offers no information on the reasons alleged by the firm. However, from other sources (labour court statistics) we know that around 80% of individual firings are justified on disciplinary reasons. On the contrary, all collective layoffs ought to be justified on economic reasons. Hence, to some approximation, we can take individual firings as disciplinary firings while collective layoffs correspond to economic dismissals.

5.2. Estimates

5.2.1. Italy

We initially test the effect of the 15 employee threshold in Italy on layoff probabilities. In particular, we regress the probability of being laid-off from period t to $t+1$ on a number of personal (gender, age, educational attainments, region of residence) and firm's characteristics (industry of affiliation, the number of employees at t in the plant the worker is attached to) plus a firm's size dummy capturing possible thresholds effects. Workers being laid-off are those who are not employed at $t+1$ while they were at t and who declare to have lost their job because of a dismissal. The sample includes only employees at t. We consider first workers with permanent contracts ("regular" workers) at t and then employees with a fixed-term contract.

As noted above, these probit regressions do no identify threshold effects implied by EPL if the relationships between job turnover and wage differentials, on the one hand, and firm's size, on the other, are not controlled for. We initially confront this issue by running three different specifications: i) regressions with two dummy variables, one for firm below 50 employees and another for firm below 15 employees, ii) regressions with two dummy variables, one for firm below 30 employees and another for firm below 15 employees, and iii) regressions with continuous size variables (the logarithm of the number of employees and its squared) and a dummy variables for firms below 15 employees. In each case the first variable is expected to capture firm-size specific turnover and wage effects, while the second variable is expected to capture EPL threshold effects. We

also run separate regressions for men and women since EPL, together with rules against sexual discrimination may imply different firing probabilities. Finally, we compare the marginal effects of firm's size variables on the layoff probabilities of permanent and temporary worker. Were these variables capturing turnover of wage differentials effects across firms of different size, we should expect them to have similar marginal effects on layoff probabilities both for permanent and for temporary workers.

The results regarding the marginal effects of the dummy variable for firms below 15 employees on layoff probabilities, for both permanent and temporary workers, are displayed in Table 5.1. Overall we observe a statistically significant and positive effect of the dummy capturing firms below the threshold scale defined by the Statuto dei Lavoratori in order to exempt small firms from the domain of application of the most stringent EPL provisions. This effect seems to be more significant, from a statistical point of view, for men than for women. And it is not present, however, when we focus on temporary workers. All this is evidence in support of the existence of EPL threshold effects.

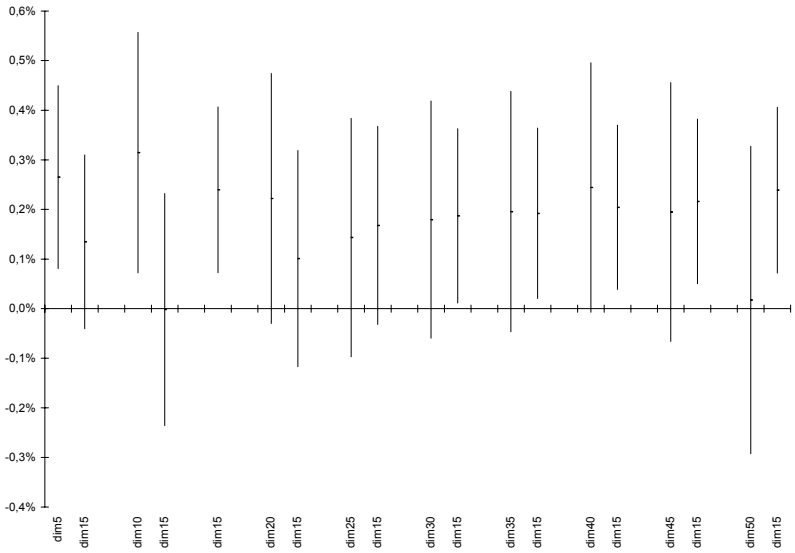
The choice of discrete firm size variables to capture turnover and wage differential effects, as in the first two specifications above, is obviously arbitrary. To check the robustness of the 15-employees threshold effect on layoff probabilities, we run alternative regressions including firm's size dummy variables at different levels (5, 10, 20, 25, 35, 40 and 45 employees) together with the dummy variable for firms below 15 employees. The results (point-estimates and their 95% confidence interval bands) are presented in Figures 5.1(a) to 5.1(c) together with the results from the two previous specifications. For all permanent workers, the 95% confidence intervals corresponding to the dummy variable for firms below 15 employees are always above zero when the additional firm's size variables included in the regressions are defined at levels 30 and above. This does not happen when this additional variable is defined at levels 25 and below. Given the "heaping" problem commented above and the relatively small sample size, we would not take this finding as conclusive evidence against EPL threshold effects. In any case, the results are less favourable when running separate regressions for men and women (see Figures 5.1(b) and 5.1.(c)).

Table 5.1. Effects of EPL firms' size threshold on layoff probabilities. Marginal effects from probit estimates. Italy, 1994-1996

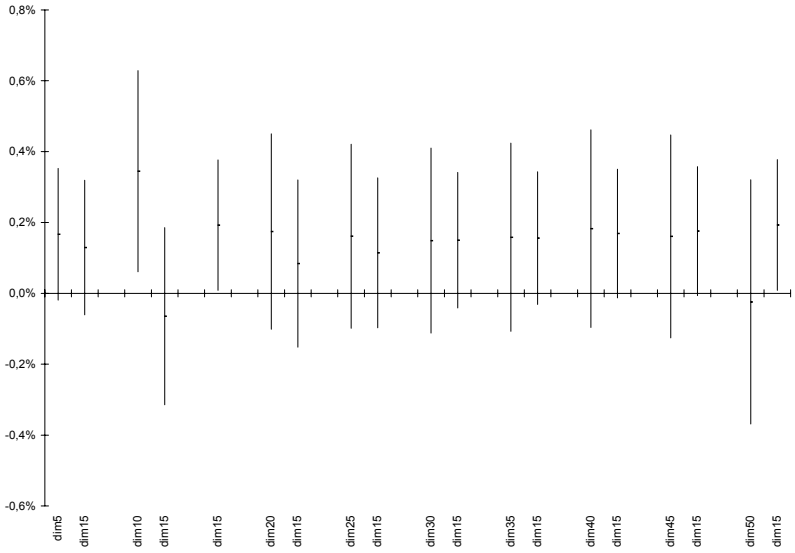
Permanent Workers			
	All[1]	All[2]	All[3]
Less than 15 employees	0.28	0.25	0.24
	3.3	2.4	2.9
Temporary Workers			
Less than 15 employees	−0.21	−0.21	−0.01
	1.4	1.2	0.3
Permanent Workers			
	Men[1]	Men[2]	Men[3]
Less than 15 employees	0.171	0.142	0.145
	0.25	0.21	0.19
	2.7	1.8	2.2
Temporary Workers			
Less than 15 employees	−0.17	−0.24	−0.02
	1.1	1.3	0.2
Permanent Workers			
	Women[1]	Women[2]	Women[3]
Less than 15 employees	0.27	0.25	0.25
	1.8	1.3	1.6
Temporary Workers			
Less than 15 employees	−0.13	−−	0.00
	0.8	−−	1.0

Sample: LFS 1993-1996. In each cell the first row is the marginal effect (in percentage points) and the second row is the corresponding unsigned t-statistics. All regressions include worker's age and age squared, educational attainment, tenure and tenure squared, dummy for services, dummy for part-time, regional dummies, dummies for family status, and time dummies. [1]Includes a dummy for firm's size below 50 employees. [2]Includes a dummy for firm's size below 30 employees. [3]Includes firm's size and its squared. Number of observations: All/Permanent: 45,770; All/Temporary: 5,347; Men/Permanent: 28,999; Men/Temporary: 3,301; Women/Permanent: 16,771; Women/Temporary: 1,626.

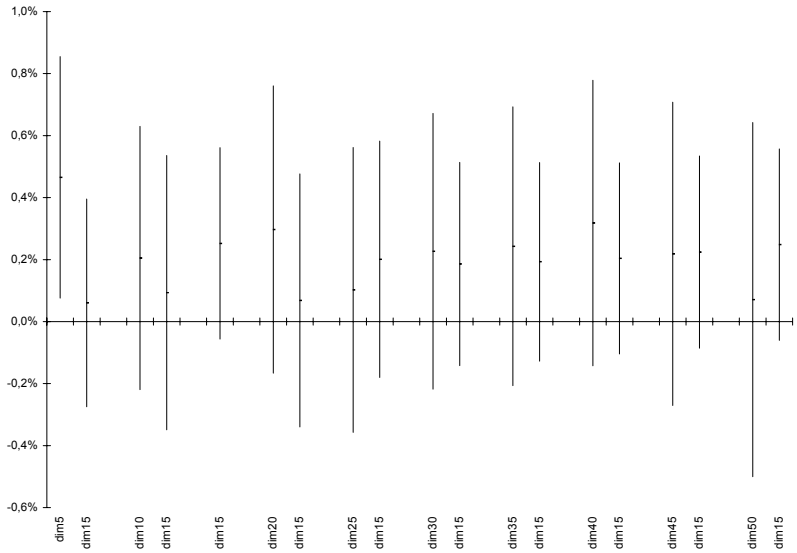
Figure 5.1. Marginal effects of firm's size variables on layoff probabilities. Italy, 1994-1996.
(a) All permanent workers.



(b) Male permanent workers.



(c) Female permanent workers.



Note: dim(i): dummy variable for firms below i employees

5.2.2. Spain

Our sample for Spain does not contain a continuous variable on the firm's number of employees. Moreover, Spanish EPL does not refer to any specific firm's size threshold for application of different rules (other than the 25 employee level below which firms can claim subsidies for objective dismissals). Hence, we cannot follow the same empirically strategy as in the Italian case. However, we can observe individual and collective dismissals. To the extent that, for small firms, red tape costs involved in individual dismissals are lower than those implied by collective dismissals, and the contrary happens for large firms, we should observe that individual/disciplinary layoffs are more frequent in small firms, while collective/economic dismissals are more frequent in large firms.

Table 5.2 gives the marginal effects of firm's size on the probability of individual firings, collective dismissals, and not renewal of fixed-term contracts estimated on Spanish data. As in the analysis of the Italian evidence, we face the problem of controlling turnover and wage effects. In the lack of a better alternative, we do so with a more complete set of co-variates representing worker's and job's characteristics, taking advantage of a much larger sample size. Thus, besides the four firm size dummies (1-9 employees, 10-19 employees, 20-49 employees, and 50 employees or more) each of the three probit regressions includes the following regressors: GDP growth (at the quarterly frequency), year and quarterly dummies, five dummies for educational attainments, eleven dummies for the economic sector of the firm, eight occupational dummies, four dummies for worker's tenure, worker's age and age squared, four dummies for the worker's family status, and seven regional dummies.

We run separate regressions for men and women since there are noticeable differences in both the weight of employment in large firms and the incidence of fixed-term employment across gender. We try alternative specifications entering firm size dummies separately and then jointly. Were the effects on layoffs probabilities only the result of different turnover rates in firms of different size, we would observe positive coefficients for larger firms, independently of the definition and number of firm size dummies included in the regression. As an additional test we run similar regressions for employees under fixed-term contracts to estimate the effects of firm size of the probability of the employment contract not being renewed. Again, if all we are measuring are differences in turnover rates, there should be no significant differences in the effects of for firm size on layoff probabilities and the probabilities of not renewal of fixed-term employment contracts.

According to the results large firms are less likely to dismiss workers under

individual layoffs. Even within small and medium size firms (below 50 employees) there seems to be a negatively correlation between size and probability of firing individually (see the last two columns of table 5.2). As for collective layoffs, we only find a significant positive effect for firms over 50 employees, in the case of male workers. Finally, the coefficients of firm size dummies in the regression for the probability of not renewal of fixed-term contracts show a completely different pattern: they are considerably higher for women in large firms, and for men in firms with 20-49 employees.

Overall, we also find the results for Spain consistent with the predictions of the model in section 5.2. Large firms, which cannot monitor workers very closely, are less likely to use individual/disciplinary layoffs. Thus, they usually adjust their labour force in "chunks", justifying economic reasons and taking advantage of the lower red tape costs per worker and alternative labour force adjustments schemes (early retirement, more generous unemployment insurance schemes) involved in collective dismissals.

Table 5.2. Effects of firm's size on layoffs probabilities. Marginal effects from probit estimates, Spain, 1992-1999

	Men	Women	Men	Women	Men	Women	Men	Women
Individual layoffs								
10-19	0.47	0.30	–	–	–	–	−0.16	−0.89
	2.8	0.8					1.5	2.5
20-49	–	–	0.12	0.36	–	–	−0.42	−0.91
			0.5	0.8			1.9	2.2
50 or more	–	–	–	–	−1.22	−2.58	−1.36	−2.93
					7.8	7.9	7.5	8.4
Collective layoffs								
10-19	−0.05	0.06	–	–	–	–	0.09	0.06
	0.6	0.5					0.8	0.4
20-49	–	–	0.01	0.15	–	–	0.16	0.13
			0.1	1.0			1.1	0.8
50 or more	–	–	–	–	0.18	−0.11	0.26	−0.07
					2.1	1.1	2.3	0.5
Not renewal of fixed-term contract								
10-20	0.51	0.30	–	–	–	–	0.41	0.68
	3.3	1.3					2.4	2.6
20-49	–	–	−1.24	−0.50	–	–	−1.06	0.4
			4.8	1.4			3.8	0.1
50 or more	–	–	–	–	0.17	1.03	0.21	1.31
					0.8	3.7	0.9	4.3

Sample: LFS, 1992-1999. In each cell the first row is the marginal effect (in percentage points) and the second row is the corresponding unsigned t-statistics. Additional regressors are GDP growth, year and quarterly dummies, five dummies for educational attainments,eleven sectoral and eight occupational .dummies, four tenure dummies, age and age squared, four dummies for family status, and seven regional dummies. Unsigned t-statistics in parenthesis. Sample sizes: Individual dismissals/Men: 44,170; Individual dismissals/Women: 16,096; Collective dismissals/Men: 43,382; Collective dismissals/Women: 15,609; Temporary/Men: 168,281. Temporary/Women: 92,283.

6. Final Remarks

There are a few institutional features of the labour market which have been as thoroughly investigated as employment protection. Despite the attention devoted by applied economists to this issue, we still know very little about the impact of these regulations on employment adjustment of firms. Above all, it is difficult to isolate the effects of EPL from those of other institutional features of the labour market. This is because most of the work has been carried out in terms of cross-country and pairwise correlations between EPL and several measures of labour market performance.

In this paper we take a different approach in that we focus on within country variation in the enforcement of EPL. In particular, we draw inferences from the exemptions clauses which are envisaged to relieve small units from some red tape costs associated with EPL as well as on regulations concerning collective dismissals. To this end, we develop a theoretical model which extends standard model of EPL in that it disentangle disciplinary from economic layoffs and provide a rationale for these exemption rules.

Our empirical results are in line with the prediction of the model: the small firm (15 employees) threshold does indeed matter in conditioning layoff probabilities in Italy. And in Spain firm size also matters both for layoff probabilities and the cause alleged for the dismissal.

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