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**Working Paper**

## Turning a blind eye? Compliance to minimum wages and employment

Working Paper, No. 85

**Provided in Cooperation with:**

Università Cattolica del Sacro Cuore, Dipartimento di Economia e Finanza (DISCE)

*Suggested Citation:* Garnero, Andrea; Lucifora, Claudio (2020) : Turning a blind eye? Compliance to minimum wages and employment, Working Paper, No. 85, Università Cattolica del Sacro Cuore, Dipartimento di Economia e Finanza (DISCE), Milano

This Version is available at:

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**Working Paper Series**

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Minimum Wages and Employment**

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**January 2020**



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# TURNING A BLIND EYE? COMPLIANCE TO MINIMUM WAGES AND EMPLOYMENT \*

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## **Abstract**

In this paper, we explore the relationship between non-compliance with bargained minimum wages and employment. We illustrate the role of labour courts with respect to the Constitutional provision of “fair” wage and sketch a model in which firms choose their desired levels of employment and non-compliance. We show that when employers internalize the expected costs of non-compliance, the effect of deviating from the bargained minimum wages on employment levels are modest, or null. Using data from the Italian LFS, we find evidence of a positive, but small, trade-off between non-compliance and employment. We discuss the policy implications of these findings for wage bargaining, also considering the costs that “turning a blind eye” to non-compliance implies for the Italian system of industrial relations.

**JEL classification:** J08, J31, J52, J83

**Keywords:** collective bargaining, sectoral minimum wages, compliance

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\* We are grateful to Enrico Roletto for outstanding research assistance. Pierre Cahuc, Andrea Ichino, Pedro Martins, Carlo Menon, Daphne Nicolistas, Giovanni Pica and Jonathan Thomas provided useful comments. We are also grateful to participants at the AIEL Conference and seminars held at Queen Mary University of London, University of Cagliari, Università Cattolica, Confindustria and the OECD. Claudio Lucifora acknowledges funding from the European Union (CoBExt action, grant VS/2016/0340) and Università Cattolica D.3.2. Strategic Project “Evidence Based Anti-Poverty Policies”. This study reflects only the authors' views and should not be attributed to the OECD. The European Commission is not responsible for any use that may be made of the information that the study contains. E-mail addresses: Claudio Lucifora (corresponding author) [claudio.lucifora@unicatt.it](mailto:claudio.lucifora@unicatt.it); Andrea Garnero [andrea.garnero@oecd.org](mailto:andrea.garnero@oecd.org).

## 1. Introduction

Twenty-five years after the seminal paper by Card and Krueger (1994), the debate on the effects of minimum wages keeps dividing economists and policy-makers. Most studies continue to focus on the effects on employment and hours of work and tend to suggest that the negative effects that one may expect following the basic economic theory are limited and, at most, concentrated among low-skilled and young workers.

To rationalise the lack of strong negative effects, the literature has looked into the role of other margins of adjustments (e.g. rest of the wage structure, prices, productivity, etc.) or the presence of monopsony power. However, most studies tend to assume a perfect enforcement of the minimum wage legislation. In practice, another channel which companies have when the minimum wage, either a statutory one or in the form of wage floors set in collective agreements, increases is simply not to comply with the new minimum wage and pay wages below the legal rates (Ashenfelter and Smith, 1979).

In this paper, we contribute to the literature on minimum wages and collective bargaining investigating the link between non-compliance with sector-wide minimum wages and employment. If enforcement is not perfect, non-compliance may be an (illegal) alternative option for companies to adjust to an increase in the minimum wage and would contribute to explain no or limited employment effects of the minimum wage. Within a competitive framework and no risk of sanctions, if wage floors are set above the market clearing level, any deviation below that threshold implies a lower marginal cost and a higher level of employment. Basu, Chau and Kanbur (2010) argue that turning a “blind eye” can be an efficient, and credible, strategy for governments more interested in efficiency than in distribution as it guarantees higher wages for some workers (in those firms that can pay higher wages) while not harming employment opportunities of less productive workers in firms that cannot pay higher wages. By contrast, in an imperfect labour market setting, such as in the presence of monopsony, stronger enforcement leads to higher employment (Soundararajan, 2019).

However, in a competitive framework, if employers anticipate the risk of sanctions, employment may still be negatively affected, as employers need to factor in the possible costs in case of an inspection (Chang and Ehrlich, 1985). In fact, when employers are free to choose the

level of compliance along with total employment, the resulting level of employment is likely to be consistent with the full-compliance level even if compliance is only partial (Yaniv, 2001). In this case, turning a “blind eye” is not only illegal and unethical but not even an efficient strategy as it does not level the playing field among workers and companies, nor it minimises the negative effects on employment.

Recent studies have found a substantial degree of non-compliance in different countries. Rani et al. (2013) provides estimates of non-compliance in 11 developing countries and they find that non-compliance ranged from 5% in Vietnam to 51% in Indonesia in the late 2000s. Bhorat et al. (2015) provides evidence for seven sub-Saharan African countries finding a high degree of non-compliance, ranging from 20% in Tanzania to 80% in Mali. Non-compliance, however, is also significant in some OECD countries. Statistics by the US Bureau of Labor Statistics estimate it at around 2%. A recent report by the UK Low Pay Commission suggests that up to 1 in 5 minimum wage workers may actually be paid less than what they are legally entitled to (Low Pay Commission, 2017). Survey data for Germany show that 3 to 4 percent of all employees are paid less than the minimum wage (Bruttel et al., 2017).

In Italy there is no statutory minimum wage and wages are set by collective agreements signed by unions and employers organisations at the industry level. Currently, around 860 industry-wide collective agreements cover practically all private-sector employees in Italy, while trade union density (the number of members over the total number of employees) is below 30% in the private sector and employers’ organisations density just above 50% (OECD, 2017 and D’Amuri and Nizzi, 2017). A national collective bargaining agreement (CCNL) is usually renewed every three years (prior to 2009, wage levels were generally renegotiated every two years). However, in practice, collective agreements tend to last longer as renegotiations are only rarely completed on time and the old terms of employment apply until a new agreement is signed.

Wage floors set through collective negotiations at the industry level are in general quite high. When compared to the median wage (using the so-called Kaitz Index, the ratio of the minimum to the median wage), they range between 74% to more than 100% according to the industry considered. Since nominal wage floors are negotiated at national level, they are the same in all areas and regions of the country. However, Garnero (2018) shows that there is a substantial regional

variation when wage floors are computed with reference to the regional median wage or in terms of local purchasing power parity: they tend to be higher in Southern regions compared to Northern ones, thus reflecting the well-known regional differences in productivity and cost of living. Boeri et al. (2019) also show that in Italy, despite sizeable differences in economic development across the regions, average nominal wages do not vary across provinces and the relationship between local productivity and local nominal wages is very weak. Moreover, Belloc, Naticchioni and Vittori (2019) point out that in Italy workers covered by a collective agreement do not enjoy any urban wage premium. In fact, their wages in real terms are lower in more densely populated areas, contrary to the findings of the literature for other countries. Overall, the Italian bargaining system appears successful in ensuring nominal wage equality across the country at the cost, however, of significant imbalances in real terms and a misalignment with local economic conditions.

Industry-wide bargained minimum wages can be considered a functional equivalent of a statutory minimum wage if the share of workers covered is high (Garnero et al., 2015). However, an important difference is that while a statutory minimum wage applies to all workers and is legally binding, wage floors in collective agreements cover only workers in companies that have signed an agreement. Some European countries (France, for instance) formally extend the sectoral agreements to all companies with an administrative act. In Italy there is no formal extension of the collective agreements, but, to fulfil the Constitutional requirement that states that “*workers have the right to a remuneration commensurate to the quantity and quality of their work and in any case such as to ensure them and their families a free and dignified existence*”, Italian judges often use industry collective agreements as a reference. While quite common, this interpretation is controversial and in any case requires a complaint by a worker or a union to be activated. Moreover, out of the 860 collective agreements, less than a third are signed by representative unions and employers’ organisations. The others are signed by smaller unions and employers’ associations, which in some cases are negotiated with the explicit purpose to establish wage floors below the existing ones with the consent of a poorly representative union or a “yellow” union (a workers’ organisation set up or influenced by an employer). In the absence of clear and stringent rules on the representativeness of social partners and without a national minimum wage, these “pirate agreements” allow employers some discretion to pay wages below the negotiated wage floors, as far as social security contributions and other procedural requirements are respected (Lucifora and Vigani, 2019; Tomassetti, 2015; D’Amuri and Nizzi, 2017). The complex structure of sectoral bargaining, the

relatively high level of the wage floors and the weakness of the monitoring procedures contribute to explain the high level of non-compliance in Italy. Garnero (2018) and Lucifora (2017) find that between 10 and 20 percent Italian employees are paid less than the wage floors set in the relevant industry collective agreement. Violations occur in all industries, but are stronger in some industries, such as agriculture, commerce, hotels and restaurants where non-standard and informal forms of work are more concentrated. They are also more prevalent in the South and in micro and small firms.

FIGURE 1 HERE

Given the relative high level of the industry-wide minimum wages and the relative rigidity of collective agreements provisions, even during economic crises, “pirate agreements” may have been used as an “escape valve” to allow some flexibility in an otherwise rigid system allowing employers to adjust wages downward (D’Amuri and Nizzi 2017, Lucifora and Vigani, 2019). In this case, turning a “blind eye” on non-compliance may be a pragmatic (and efficient) way to leave some flexibility to employers and safeguard employment levels within the current institutional system.

In the first part of the paper, we model the hiring and compliance behaviour of employers within the Italian institutional setting. The model sketches the main features of minimum wage compliance in Italy and the role of labour courts in interpreting art. 36 of the Italian Constitution. It describes how an employer may be held liable for deviating from industry-wide wage agreements and the costs employers may face when workers appeal to a labour court to be paid a “fair” wage. The model shows that when employers fully internalize the expected costs of non-compliance, the optimal level of employment chosen will be lower than the competitive equilibrium. In other words, even if the employer complies only partially, the optimal level of employment is likely to be independent of the sanctioning process and be the same as if the bargained wage was paid to all workers (Yaniv, 2001). While this strong “neutrality” result on employment might not hold in practice, as employers are unlikely to fully internalise the expected costs or under-estimate the total costs of labour courts decisions, yet it conveys the idea that the trade-off between negotiated minimum wage non-compliance and employment may be smaller than typically expected, when Governments turn “a blind eye” to non-compliance. In the second part of the paper, we test the theoretical predictions using information on firms’ non-compliance and employment drawn from



LFS data. We show that employers' non-compliance with negotiated sector-wide minimum wages is rather common in Italy, with a higher incidence in the service industry and in Southern regions. Higher non-compliance is shown to be associated with more employment, within specific industry-region cells. The elasticity of employment to non-compliance is estimated to be around 0.2, suggesting that, as implied by the theoretical model, the trade-off with employment while being positive and statistically significant, is not very large as employers also factor-in the costs of non-compliance.

The remainder of this paper is organised as follows. Section 2 develops a theoretical model of partial non-compliance and employment. Section 3 describes the empirical strategy and the data used to investigate the role of non-compliance on employment. Section 4 presents the results and section 5 concludes and discusses the policy implications.

## 2. Theoretical framework

In this section, we model the hiring and minimum wage compliance decisions of employers. The model sketches the main features of sectoral minimum wage setting in collective agreements, employers' compliance behaviour and the role of labour courts with reference to the institutional context previously discussed. It describes how an employer may be held liable for deviating from sectoral minimum wage levels and the costs employers may face when workers appeal to a labour court to be paid a "fair" wage (according to art. 36 of the Italian Constitution). In the absence of a statutory minimum wage, employers adherence to the wage minima set in collective agreements is subject to the monitoring of the Ministry of Labour or has to be enforced by workers who, as previously described, must refer to labour courts' intervention.<sup>1</sup>

Firms only employ workers in production. Output is  $y = \theta f(L)$ , where  $f(L)$  is a strictly concave function,  $\theta$  is an efficiency parameter, while prices are normalised to one. Collective bargaining takes place at the industry level where a trade unions and an employers organization

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<sup>1</sup> There is wide empirical evidence showing that judges in Labor Courts exploit some degree of discretion in settling the cases. Some studies have shown the existence of some regularities between local labor market conditions (i.e. unemployment rate) and labor courts' decisions Ichino et al. (2003). In Germany, even after controlling for the fact that court activity varies systematically with the political leaning of the government that appoints judges, there is a significant positive relation between labor court activity and unemployment (Berger and Neugart, 2012). In the UK unemployment and firms' bankruptcy rates seem also to be statistically associated with the probability of judges deciding in favour of dismissed employees in unfair dismissal trials.

bargain over the wages to be paid in the industry. We assume that bargaining parties only care about the aggregate welfare of the existing firms and employed workers in the industry and set the wage level above market clearing (Jimeno and Thomas, 2013 and Moene and Wallerstein, 1997). Since the bargained wage ( $w^B$ ) is uniform across all firms in the industry and higher than the competitive level ( $w$ ), employers can behave as “price takers” and pay all workers,  $w^B$ , or deviate from that level paying a lower wage level,  $w$ , equal to the market clearing level. We consider the case in which the employer deviates only partially paying  $w^B$  to  $L^B$  workers (with  $L^B \leq L$ ), while paying  $w$  to the remaining  $(L - L^B)$  workers. Notice that employer non-compliance with collective bargaining outcomes can originate for different reasons: either from deviations from normative rules (i.e. exploiting loopholes in collective bargaining representation and applying the so-called “pirate agreement”, with lower wage provisions), or just originate from opportunistic behaviour (i.e. simply paying a wage below the bargained levels) to save on labour cost. Workers can accept the lower wage offer ( $w$ ) or sue the employer in a labour court to claim the right to be paid a “fair” wage. While the “fair” wage threshold in the Italian system is at the discretion of the judge, often the bargained wage ( $w^B$ ) is chosen as the reference level.

If employers are referred to a labour court, they incur in additional costs. These costs, in part, depend on fixed administrative charges ( $\tau$ ), due to the length of the trial, as well as from the uncertainty in the court decision. Other costs originate from sanctions levied on employers when the court decision establishes that the lower wage level, compared to the bargained level, is a violation of the “fair” wage Constitutional provision. We model the costs ( $\Theta$ ), originating from the labour court decisions, as a multiple ( $\lambda$ ) of the wage gap ( $w^B - w$ ), and proportional to the number of workers paid below the industry minima ( $L - L^B$ ). In practice, we specify the costs of non-compliance as,  $\Theta = q\tau + (1 - q)(\tau + \lambda(w^B - w))$ , where  $q$  is the probability that the court ruling is in favour to the employer and no violation are found. In this case, there are only fixed administrative costs ( $\tau$ ) associated with the Court activity – i.e. red-tape due to the length of the trial and uncertainty in the Court decision, while no sanctions levied on the employer. Conversely  $(1 - q)$  denotes the probability that the employer is found liable and sanctioned. The sanction involves an obligation by the employer to compensate the underpaid workers ( $L - L^B$ ) with a multiple  $\lambda$  of the wage gap ( $w^B - w$ ).

When deciding whether to comply or not with the collective contract provisions, the employer takes into account the probability that workers who are underpaid will accept the lower wage offer, or appeal to the labour court to obtain the payment a “fair” wage. Employers are risk-averse, with utility  $U(\pi)$ , defined as a strictly concave function of profits. When workers accept the lower wage offer, the employer’s payoff is  $U(\pi^H)$ , conversely when they sue the firm in Court the payoff is  $U(\pi^L)$ . Clearly  $U(\pi^H) > U(\pi^L)$  as profits are higher when the wage paid to workers is lower and there are no sanctions or other administrative costs.

$$U(\pi^J) = U[\theta f(L) - w^B L^B - (w + \Theta^J)(L - L^B)] \quad (1)$$

where  $J = H, L$  and  $\Theta = 0$  if  $J = H$ . Employer’s expected utility is then:

$$EU(\pi) = [1 - \varphi(L - L^B)]U(\pi^H) + \varphi(L - L^B)U(\pi^L) \quad (2)$$

where  $\varphi(L - L^B)$  is the probability that workers sue the employer in court to be paid the “fair” wage, which is monotonically increasing in the number of underpaid workers - i.e.  $\varphi'(L - L^B) > 0$  and  $\varphi''(L - L^B) \geq 0$ .

The employer maximises expected utility choosing both total employment ( $L$ ) and compliance with collective bargaining wage provisions, that is choosing the number of workers who are paid the bargained wage ( $L^B$ ). Differentiating (2) with respect to  $L$  and  $L^B$ , and rearranging the first order conditions we obtain:

$$\theta f'(L) = w + \frac{\Psi}{EU'(\pi)} \quad (3)$$

$$(w^B - w) = \frac{\Psi}{EU'(\pi)} \quad (4)$$

Equation (3) describes the employer’s labour demand with marginal productivity equal to the wage paid to workers ( $w$ ) plus the ratio of the employer’s expected cost from non-compliance associated with labour court ruling ( $\Psi > 0$ )<sup>2</sup> and the expected marginal utility from paying a wage lower than the bargained minimum wage ( $EU'(\pi)$ )<sup>3</sup>. Note that, subject to a participation constraint

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<sup>2</sup>  $\Psi = \varphi_0(L - L^B)[U(\pi^H) - U(\pi^L)] + \varphi(L - L^B)\Theta U(\pi^L)$

<sup>3</sup> From (2) above we obtain,  $EU_0(\pi) = [1 - \varphi(L - L^B)U_0(\pi^H)] + \varphi(L - L^B)U_0(\pi^L)$

(i.e. workers accept the lower wage offer), the lower the expected costs and probability that workers will sue the firm, the higher total employment will be. In other words, there is an implicit trade-off between employers non-compliance and the level of employment, which explains why Governments may sometimes adopt a “blind eye” attitude *vis-à-vis* employers’ non-compliance. Equation (4) describes instead the employer’s decision to comply, that is how many workers are paid at (or above) the bargained wage. This decision also depends on the expected costs associated with the gap between the (higher) bargained wage level and the (lower) market clearing wage, on the one hand, and the benefits from compliance in terms of lower probability that the employer is referred to the Court (i.e. a function of the number of workers who are underpaid) and the court’s ruling (i.e. Court’s decision favourable to the employer).

However, if employers, when deciding employment and compliance levels, fully factor in the potential costs of non-compliance associated with sanctions and labour courts ruling, the resulting level of employment turns out to be the same as with full-compliance. In practice, substituting (4) in (3) we obtain ,  $\theta f'(L) = w^B$  which suggests that total employment is independent of the costs from non-compliance and equal to the level that would prevail when the bargained wage is paid to all workers (Yaniv, 2001)<sup>4</sup>. While, this “strong neutrality” effect of non-compliance is likely to hold only under quite restrictive conditions, it does convey the idea that the employment gains from minimum wage non-compliance may be smaller than typically expected<sup>5</sup>.

Notice that, since under compliance (even if only partial) the cost of labour is higher and profits are lower, employers always have an incentive to pay lower wages. This is also consistent with the patterns of non-compliance across Italian regions described in Figure 1. Hence, it may be interesting to investigate which are the driving factors for employers non-compliance. We evaluate at  $L^B = 0$  the condition,  $\frac{[\partial EU(\pi)]}{\partial L^B} > 0$  , for complying (at least partially) with the bargained wage level, which implies:

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<sup>4</sup> The second-order conditions for a maximum at  $\theta f'(L) = w^B$  are guaranteed by the concavity assumption in  $U(\pi)$ ,  $f(L)$  and the convexity assumption on  $\varphi(L - L^B)$  (Yaniv, 2001).

<sup>5</sup> Also notice that high productivity firms (higher  $\theta$ ) will in general pay higher wages and have a smaller wage gap relative to the bargained wage.

$$\frac{EU'(\pi) - \varphi'(L)[U(\pi^H) - U(\pi^L)]}{U'(\pi^L)} \leq \frac{\varphi(L)\Theta}{(w^B - w)} \quad (5)$$

since the left-hand side of (5), by employer's risk aversion, is less than one (or negative), the inequality is more likely to be satisfied when the probability that underpaid workers refer to the court ( $\varphi(L)$ ) and the costs associated with non-compliance ( $\Theta$ ) are both sufficiently high. The latter occurs when the probability that the court ruling is in favour of the employer ( $q$ ) is low, and the sanctions levied on the employer ( $\lambda$ ) are high. Hence, in contexts where productivity is low and employers find more difficult to match the bargained wages, we may expect that governments are more likely to turn a "blind eye" to non-compliance by lowering inspection standards and allowing employers to pay lower wages. This also raises the implicit costs that workers face in referring to labour courts, thus *de facto* reducing the chances that underpaid workers see their right to a "fair" wage re-established by the court rulings. Alternatively, non-compliance can be obtained as a corner solution, when  $\frac{[\partial EU(\pi)]}{\partial L^B} < 0$  at  $L^B = 0$ , which implies that all workers are paid less than the bargained wage level and the level of employment is higher compared to the full compliance level. In other words, there are equilibria in which employers use discretion in paying wages below the bargained wage levels, while Governments choose to tolerate such opportunistic behaviours to safeguard higher employment levels. However, as shown above, the trade-off between non-compliance and larger pool of underpaid workers might be smaller than expected if employers internalize the implications of partial compliance.

### 3. Empirical strategy

The theoretical framework sketched above has conveyed the idea that when sectoral bargaining sets wages at a higher level than the market clearing one, employers may trade a higher risk of sanctions from paying wages below the minimum bargained level to some workers with higher profits and more employment. Employers' non-compliance may further be exacerbated by complacent governments that turn a "blind eye" by lowering enforcement and sanctioning standards expecting some efficiency gains, and higher employment, from less productive firms. Despite the relevance of the above implications, the empirical evidence on these issues is still rather scarce. In particular, as the theoretical predictions make it clear, the direction and size of non-compliance on

employment levels are eminently an empirical matter. In this section, we discuss the implications of the theoretical model for the empirical analysis and highlight some measurement issues.

We begin specifying a firm-level employment equation where the level of employment ( $L_{ijrt}$ ) of the  $i$ -th firm operating in the  $j$ -th industry and located in region  $r$  depends on the industry-wide bargained wage ( $w_{jt}^B$ ), the rate of non-compliance within the firm ( $NC_{ijrt}$ ), a vector of firm-level attributes ( $X'_{ijrt}$ ), firm-specific time-invariant attributes ( $\gamma_i$ ), a vector of region fixed-effects ( $\theta_r$ ) a common time effect ( $\eta_t$ ) and unobserved error component ( $\rho_{ijrt}$ ). Specifically, we assume:

$$L_{ijrt} = \lambda w_{jt}^B + \beta NC_{ijrt} + X'_{ijrt}\delta + \gamma_i + \theta_r + \eta_t + \rho_{ijrt} \quad (6)$$

where the coefficient  $\lambda$  is the elasticity of firm's employment to the industry-wide bargained wage, and  $\beta$  is our parameter of interest which captures the direct effects of firm's non-compliance with respect to the firm's employment level. Notice that while the firm takes as given the industry-wide bargained wage, it chooses employment and non-compliance levels. Moreover, unobserved factors, such as the employer's propensity to comply and firm's productivity, are likely to affect both the type of workers employed as well as its total employment. Fully complying firms are more likely to employ high-quality workers, while non-complying employers will mostly attract low-skilled workers. This endogenous sorting of workers is likely to further exacerbate the existing productivity differences across firms within any industry and local labour market. Finally, industry and local labour market conditions may influence firm's non-compliance behaviour, as the government agency in charge of labour standards enforcement may vary the resources allocated to monitoring activities (such as the number of labour inspectors) according to local economic conditions (i.e. unemployment levels).

In order to derive a specification suitable for estimation, it is also important to discuss the measurement of non-compliance. In this respect, since non-compliance originates from an underlying illicit behaviour, information on earnings and hours worked collected in employers' surveys or available in tax archives are unlikely to truthfully report the earnings of workers, which fall below the industry-wide bargained levels. A more reliable source of information to measure employers' non-compliance comes from workers self-reported earnings (and hours worked) often

available in labour force (or household) surveys.<sup>6</sup> While we return the discussion of measurement errors and other measurement issues to the data section, here it is important to highlight one limiting aspect of labour force surveys, which typically do not provide the firm identifier, thus making estimation of equation (6) unfeasible. To deal with the above data issues as well as to circumvent the potential non-randomness of firms' (non)compliance behaviour and the sorting of workers across firms, we follow Card and Rothstein (2007) by aggregating equation (6) at the industry-region level and using a fixed-effects estimator.<sup>7</sup> Specifically, we rewrite equation (6) replacing the firm's level variables by their level in industry  $j$  and region  $r$ , as specified in equation (6') below,

$$L_{jrt} = \lambda w_{jt}^B + \beta NC_{jrt} + X'_{jrt}\beta + \gamma_{jr} + \eta_t + \varepsilon_{jrt} \quad (6')$$

where  $L_{jrt}$  is the total employment in industry  $j$  and region  $r$ ,  $NC_{jrt}$  is the average rate of non-compliance of firms in the industry-region,  $\gamma_{jr}$  are the industry-region fixed-effects, while all other covariates are defined accordingly. Notice that while the *within* industry-region level of analysis does not eliminate all the firm-level unobserved correlations, it substantially reduces the bias originating from the non-random sorting of workers and firms by their non-compliance decisions. Moreover, notice that any residual unobserved idiosyncratic firm-specific shock - such as a positive productivity shock, which increases employment while reducing non-compliance - is likely to bias our estimate downwards towards finding no effect. Finally, while the industry-regions fixed-effects account for the time-invariant unobservable characteristics *between* industry-regions, we also add to our baseline specification a rich vector of observed industry-regions characteristics to control for time-varying characteristics of industries and regions. Namely, our more general specifications include: the share of young workers (age <35), share of temporary employment, share of women, share extra-EU immigrants, share of employment in SMEs and the share low educated workers (less than tertiary diploma). In addition, to account for the presence of different standards in the efficiency of labour courts in sanctioning non-complying employers, we also test a specification controlling for the length of trials at the regional level. Finally, we also test the robustness of our estimates to the inclusion of industry-regions specific time trends.

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<sup>6</sup> Hours worked are an important source of non-compliance, since employers may use fake part-time contracts, pay lower overtime premia or ask workers to work longer without paying them.

<sup>7</sup> While an instrumental variable estimator might be a better option to retrieve the causal effect of firms' non-compliance on employment, the lack of a suitable firm-level instrumental variable for employer's compliance decisions such strategy is not possible in the present context.

### 3.1 Data

In the empirical analysis we combine information from different sources. We use a sample of the most representative collective agreements (in terms of workers covered) collected and monitored by ISTAT<sup>8</sup>, which we match to information drawn from the Italian Labour Force Survey (LFS) on earnings and hours worked by workers. Other local labour market characteristics at the industry-region level are also included.

#### *Wage floors in collective agreements*

The data used in this analysis represent a specific extraction of the minimum value in each agreement (therefore the lowest occupational level excluding seniority or other pay elements defined in collective agreements such as wage supplements for night shifts or particular activities, or bonuses). Wages are before taxes and transfer and (in many cases) include the 13th or 14th monthly payment (i.e. a sort of delayed annual payment). Moreover, they also account for the presence of arrears in the case of late renewal (*salari di competenza*). Bonuses related to individual performance or individual working conditions, supplementary payment agreed at the company or local level are excluded.<sup>9</sup> The data cover the period 2008-2015. In 2015, gross minimum wages in collective agreements were on average 1,387 euros/month including the 13th and the 14th month (if paid), 12.7% higher in nominal terms than in 2008 when they were around 1,230 euros/month. Gross minimum wages in collective agreements are very high compared to the median wage (about the 75% of the median).

#### *Individual wages and other individual-level controls*

Information on individual wages, as well as on the workforce composition, is drawn from the Labour Force Survey (LFS) over the period 2008-2015. LFS is the most comprehensive data source to study non-compliance since wages and hours are reported by the respondent and so less likely to be misreported by employers to “formally” comply with regulations (i.e. as typically done

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<sup>8</sup> ISTAT collects data on negotiated gross wages, including tax and social security contributions paid by employees, in around 90 collective agreements (the most representative ones) for its database on collective agreements and contractual wages.

<sup>9</sup> The ISTAT minimum wage data are classified by NACE rev. 2 at 2-digit codes using a mapping established by ISTAT (and by Nace rev. 1 before 2011).



in administrative data) and more likely to reflect the real wages earned and not those that should have been paid according to the rules. Moreover, the LFS is not restricted to the formal economy. Therefore, the LFS encompasses non-compliance due to informality, non-regular forms of work, unpaid extra hours, “inadvertent” underpayment, as well as the use of “pirate agreements” (agreements legally valid but signed with poorly representative or “yellow” unions).<sup>10</sup>

The LFS collects net wage data and therefore in order to make individual wage data comparable with ISTAT minimum wage data, LFS net wages are converted to gross wages using income tax rate and social security contributions (as a % of net wages) for different levels of the average wage (from 1% to 200%) in the case of a single person without children from the OECD TaxBen model. We assume that this is the effective tax rate for all workers each month before tax adjustments and transfers done at the end of the year to take into account family composition and household total income. Individual wage data are further inflated to add the 13th and 14th months in sectors that also have to include a 13th (all sectors) and a 14th month (around 40% of the agreements in the sample). Finally, only employees above 15 year old are considered (apprentices and domestic workers are excluded as well as also *co.co.pro*, casual work because of missing wage data in the LFS).

### *Non-compliance*

Non-compliance is measured as the percentage of workers who are paid below the wage floor set in collective bargaining ( $w_{min}$ ). Formally, the non-compliance headcount indicator  $NC$  takes value 1 if  $w < w_{min}$  and of 0 when  $w \geq w_{min}$  (where  $w$  is the wage).

Since data on wages and hours worked in the LFS may be subject to measurement error (though, at least for wages, it would probably underestimate the number of workers underpaid since respondents tend to overstate wages at the bottom of the distribution)<sup>11</sup>, we take a conservative

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<sup>10</sup> Alternative sources of information on earnings in Italy are available from the Structure of Earnings Survey (SES) of Eurostat, or from the administrative archives of the Italian social security institute (INPS). While administrative data, compared to the LFS, provide more precise information on individuals’ earnings, by being filled-in by the employer the information is unlikely to report irregular workers or wages and hours of work that are not in line with those set in the collective agreements or regulated by Law. The SES, instead, is restricted to firms with more than 10 employees in the business sector, hence it excludes micro firms and the agriculture sector where non-compliance is more prevalent.

<sup>11</sup> Note that measurement error in wage and earnings data as reported in surveys has been found to be non-classical and mean reverting (which leans that low paid workers typically tend to overestimate wages at the bottom of the distribution, see Gottschalk and Huynh, 2010), this would probably bias the number of underpaid workers downwards. Moreover,

approach and restrict the sample to workers working a normal set of hours (between 28 and 52 hours), thus excluding those working very few or too many hours. Moreover, we compute non-compliance as the share of workers paid 90%, or less, compared to the reference wage floor set by the collective agreement in the sector of reference, allowing *de facto* for a margin of error of 10%.<sup>12</sup>

Table 1 provides the summary statistics of the variables used in the analysis. Reflecting the structure of the Italian labour market, a third of the employee in the sample are women, 12.7% have a temporary contract, a quarter work in a SME, almost 90% of them have reached at most secondary school, and 4% are migrants. Almost two thirds of the employee in the sample work in the service sectors, the rest in manufacturing and just around 2% in agriculture. Finally, 37% work in the North of the country, 21% in the Center, 30% in the South and 10% in the Sardinia and Sicily.

TABLE 1 HERE

## 4. Results

### *Baseline results*

Table 2 reports the fixed effects estimates of the employment relationship (equation 6') with a different set of controls for each specification. As discussed above, failing to control for sector-region fixed effects would yield biased estimates (see OLS estimates in Table A.1 in the Appendix) as industries in more economically depressed areas are likely to exhibit both lower employment as well as higher non-compliance. Results, across all specifications, show that non-compliance is positively and significantly associated with the (log of) employment levels, also when controlling for specific region-industry time trends (columns 4-5 in Table 2). Moreover, the relationship between non-compliance and employment is found to be non-linear, with a proportionally smaller effect on employment levels as non-compliance increases. The elasticity of employment to non-compliance, evaluated at its average level, is estimated around 2.1% suggesting that when non-compliance increases by 10% around its average value, employment also rises by approximately

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Garnero (2018) has shown that the distribution of wages in LFS is in line with that of administrative sources and non-compliance displays the same patterns across firm size and regions.

<sup>12</sup> Alternatively, in the extreme case where individual wages are underestimated and hours of work overestimated, this will allow a – 5% margin of error for wages and + 5% margin of error for hours of work. Also note that another source of error could come from the bottom coding of wages in the LFS (top coding is not relevant for underpayment). However, bottom coding is set at 250 euros/month which is well below any negotiated minimum wage, and therefore, unlikely to affect our estimation of the headcount of underpaid workers.

2%. The non-linearity implies, furthermore, that excessively high rates of non-compliance – i.e. above 40% in our estimates – can have detrimental effects on employment. Hence, as implied by the theoretical model, the trade-off between non-compliance and employment is likely to be small and positive at low levels of non-compliance, as employers internalize the costs of non-compliance, while it turns negative when non-compliance is higher and more likely to be detected. The estimated elasticity of (log) employment to negotiated minimum wages is, as expected negative and large. An increase in the negotiated minimum wages of about 1% is associated with a decrease in employment between 1.2% and 1.6%. Notice that, while an elasticity above one is quite sizeable, compared to standard estimates of own-wage elasticities of labour demand<sup>13</sup>, when estimated at the level of the minimum wage elasticities are generally found to be larger. For example, a number of studies on the effect of the minimum wage in France – a country which shares many features with the Italian labour market – report an elasticity of employment with respect to the minimum wage close to -2 for men and -1.5 for women (Kramarz and Philippon 2001, Abowd et al. 2006), while Cahuc and Carcillo (2018) report an even larger elasticity close to -4.

#### TABLE 2 HERE

Table 3 reports estimates fitting the same specification as above, but using a different measure of non-compliance. In particular, we focus on the extensive margin of non-compliance, setting a value equal to zero when employers fully comply with the negotiated minimum wages, and a value equal to 1 when employers comply only partially – i.e. within any given region-sector –, or do not comply at all. Results confirm the previous findings showing a positive and statistically significant coefficient of non-compliance on employment levels in all specifications. The estimated coefficient of the extensive margin is now much larger, compared to previous estimates, a change in compliance status is associated with a 30% increase in employment levels.<sup>14</sup> Notice that in this case, the estimated effects are likely to capture an aggregate effect of switching from employers' full compliance to partial or no-compliance. The elasticity of employment to wage floors remains large and above 1.

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<sup>13</sup> Standard estimates of own-wage elasticity of labour demand, at the mean (or median) wage, fall within the range of -0.7 to -0.3.

<sup>14</sup> Re-estimating Table 3 using a set of dummies for sector/region cells where non-compliance is positive but below 2%, between 2% and 4%, between 4% and 10%, between 10% and 20%, between 20% and 30%, between 30% and 50% and above 50% shows that estimates are stable up to 50% (see Table A.2 in the Appendix).

TABLE 3 HERE

*The role of the efficiency of labour courts*

Previous literature (Giacomelli and Menon, 2017 and Gianfreda and Vallanti, 2017) has found that the efficiency of labour courts has a significant effect on employment and firms' dynamics. Hence, the effect of non-compliance on employment may also be affected by the efficiency of local labour courts and by employers' expectations about the likelihood of detection and the costs of non-compliance (Soundararajan, 2019). To account for the presence of different standards in the efficiency of labour courts in sanctioning non-complying employers across Italian regions, we augment our specification with a variable recoding the (average) length of labour courts' proceedings at the regional level. Since data on the actual duration of civil proceedings are not available<sup>15</sup>, we follow Giacomelli and Menon (2017) and we use a caseload approach to construct an index that proxies the average length of proceedings (in years) which is calculated as follows:

$$D_t = \frac{P_t + P_{t+1}}{E_t + F_t} \quad (7)$$

where  $P$  are pending cases at the beginning of the year  $t$ ,  $F$  are new cases filed during the year and  $E$  are cases that ended with a judicial decision or were withdrawn by the parties during the year. This index provides an estimate of the average lifetime of proceedings in a court, for the period 2008-2015<sup>16</sup>. Results reported in Table 4, do not show any statistically significant role of labour courts efficiency in mediating the effect of non-compliance on employment. In other words, a more efficient enforcement does not appear to affect the relationship between non-compliance and employment, as a model in which firms are able to fully internalize the costs of opportunistic behavior would suggest. Still, this result may simply reflect the fact that enforcement through labour court is rather limited, as workers that are expected to sue the employer in the first place. Moreover, the high incidence of "pirate agreements" makes enforcement through labour courts particularly complex and uncertain, as workers need to know whether their collective agreement is the correct

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<sup>15</sup> Data on the duration of labour court proceedings at regional level are provided by the Italian Ministry of Justice available at [https://www.giustizia.it/giustizia/it/mg\\_1\\_14.page](https://www.giustizia.it/giustizia/it/mg_1_14.page).

<sup>16</sup> This method is also used by the Italian Ministry of Justice and by the Italian Statistical Office (Istat) to estimate the duration of proceedings when actual data are not available.

one or not and, in the event it is not the case, sue the employer. Also labour courts, due to the lack of clear criteria and norms, often find it difficult to assess which are the collective agreement that a firm should apply, thus being subject to further litigations and appeals.

#### TABLE 4 HERE

##### *Robustness tests*

The relationship we detect between non-compliance and employment is robust and strong across different sectors and regions. Focusing on industry-wide differences, Table 5 shows that the estimated coefficient on non-compliance is not statistically different between manufacturing and services, suggesting a similar trade-off with employment. It is also interesting to notice that in the manufacturing sector the estimated own-elasticity of negotiated minimum wages is only weakly correlated with employment (i.e. the coefficient is not statistically significant), suggesting a different bite of negotiated wage floors. This result is probably capturing the stronger role that decentralised bargaining plays in the manufacturing sector, where firm-level agreements grant additional wage premia to the levels negotiated in sector-level agreements. In the service sector, due to the prevalence of smaller firms and weak bargaining power of workers, firm-level bargaining has a relatively marginal role and pay levels closely reflect pay levels negotiated by sector-level agreements.

#### TABLE 5 HERE

Table 5 also reports a statistically significant and positive relationship between non-compliance and employment in both Northern and Southern regions. The estimated trade-off in non-compliance, however, is shown to be larger in the South relatively to the North, partly due to the higher level of the negotiated minimum wages compared to the median wages (i.e. the Kaitz index) paid by local firms. Finally, our main findings are confirmed even restricting the sample period to selected years: the years of the global financial crisis years (2008-2009)<sup>17</sup>, or to the latest years available (2014-2015) when Italy was experiencing a slow recovery. In other words, the trade-off between non-compliance and employment does not seem to be exclusively related to the

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<sup>17</sup> Italy experienced a double-dip crisis. GDP growth fell in 2008-2010 and then again in 2012-2013. Since 2014, GDP has been slowly recovering.

business cycle and the crisis years, while it probably highlights a structural feature of the Italian labour market.

TABLE 6 HERE

Finally, we replicate the baseline results (column 3 of Table 3) excluding one sector and one region at the time, to ensure that the relationship is not driven by a specific sector or region. The results in the Appendix show that this is not the case (Tables A3 and A4 in the Appendix).

## 5. Conclusions

This paper explored the relationship between employers' non-compliance with sector-wide negotiated minimum wages and employment levels. In the theoretical framework, we modelled the hiring and compliance behaviour of firms, with respect to the Italian institutional setting, showing that the existence of a trade-off between minimum wage non-compliance and employment is reduced when employers internalize the expected costs of non-compliance. The main predictions of the theoretical model have been tested empirically using information on non-compliance with sectoral minimum wages and employment levels, within specific industry-region cells, drawn from LFS data.

The stylized facts we report in the empirical analysis, indicate that employers' non-compliance with minimum wages is quite diffused in Italy, particularly in the service industry and in Southern regions. The estimated effect of minimum wage non-compliance with employment levels is shown to be positive and statistically significant across different specification. While a higher proportion of workers paid below the minimum wage threshold seem to deliver more employment, with an elasticity of around 2%, the relationship is found to be non-linear with high rates of non-compliance (above 40%) reversing the positive employment effect. Hence, in line with the theoretical model, we find evidence of a trade-off between higher (lower) compliance with minimum wages and lower (higher) employment levels, though the trade-off is small and only holds when the rate of non-compliance is low. The estimated effect is larger when the extensive margin of non-compliance is considered, as what seems to matter most for employment levels is the aggregate effect of whether employers, on average, are fully complying or not. We interpret this

finding, in line with the theoretical model, as suggesting that employers always have an incentive not to comply, particularly when regulators turn “a blind eye” to partial non-compliance, but as non-compliance raises they quickly internalise the costs of non-compliance adjusting employment levels accordingly.

These results have important implications for the policy debate on wage setting institutions and the role of regulators in monitoring and sanctioning non-compliance. Turning “a blind eye” to non-compliance, in particular with regards to the proliferation of “pirate” collective agreements – as a quasi-legal way to underpay workers in Italy – is unlikely to represent an effective and sustainable strategy to cope with the rigidity of collective bargaining for the determination of sector-level minimum wages. The results in this paper show that a strict enforcement of the existing minimum wages set in collective agreements may reduce employment at the margin in less productive firms. However, non-compliance and “pirate” agreements are also used to minimise payroll taxes and social security contributions and, by not ensuring a level-playing field among firms and workers, they also contribute to the erosion of the Italian system of industrial relations. Hence, “turning a blind eye” to non-compliance and allowing the proliferation of “pirate” agreements in exchange of relatively small employment gains is unlikely to represent a sustainable strategy. In our view, fighting non-compliance, without harming employment in the medium/long-term, would require a stronger enforcement of the agreements signed by the most representative employers organisations and trade unions in exchange for additional flexibility in sector-level collective agreements to accommodate the significant productivity differentials across Italian firms and local labour markets. Such a strategy would ensure a level-playing field across companies and workers, also addressing, at least in part, the need for more wage flexibility avoiding *ad hoc* and discretionary adjustments by employers.

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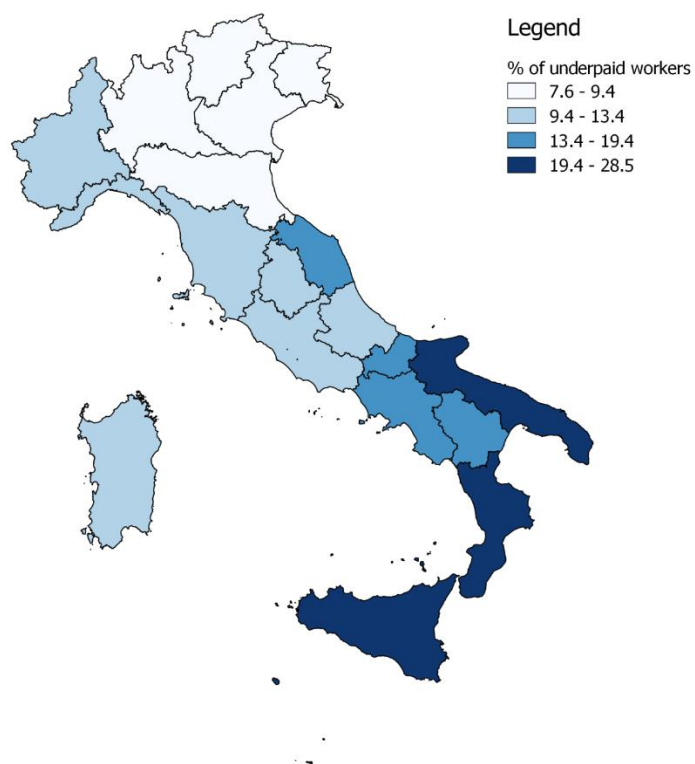
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## TABLES AND FIGURES

**Figure 1: Share of underpaid workers in Italy by region, 2015**



*Source:* Authors's calculation using data from Istat LFS 2008-2015 and negotiated wages database.

**Table 1: Descriptive statistics, 2005-2015**

<i>Main variables</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
log employment	8.06	1.7	2.06	13.05
log wage floors	4.86	0.14	4.52	5.25
Non compliance (% of workers paid less than the wage floor)	13.81	16.14	0	100
Non compliance (% of sector-region cells not fully compliant)	79.35	40.47	0	100
<i>Controls</i>				
% young <35	29.13	20.09	0	100
% temporary empl.	12.73	15.29	0	100
% women	29.75	26.23	0	100
% immigrants extra EU	4.29	7.86	0	100
% emp in SMEs	26.04	22.75	0	100
% less tertiary	87.47	18.48	0	100
<i>Sector</i>				
Agriculture	2.61			
Manufacturing	34.41			
Services	62.98			
<i>Region</i>				
North	37.67			
Center	21.26			
South	30.41			
Islands	10.65			

*Source:* Authors's calculations using the Labour Force Survey and the database on negotiated wages by Istat.

**Table 2: Baseline results: non-compliance as continuous variable - fixed effects, 2008-2015.**

Fixed Effects estimates					
	(1)	(2)	(3)	(4)	(5)
Non-compliance (*100)	1.45*** (0.17)	1.49*** (0.17)	1.48*** (0.17)	1.70*** (0.11)	1.70*** (0.17)
Non-compliance^2 (*100)	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)	-0.02*** (0.00)
Log wage floors		-1.24*** (0.31)	-1.28*** (0.31)	-1.51*** (0.20)	-1.52*** (0.26)
% young <35			0.19*** (0.07)		0.19*** (0.07)
% temporary emp.			-0.19** (0.08)		-0.19** (0.08)
% women			-0.05 (0.07)		-0.02 (0.07)
% immigrants ex-EU			-0.03 (0.15)		0.04 (0.16)
% emp. in SME			-0.10 (0.07)		-0.04 (0.07)
% low edu			0.12 (0.09)		0.15* (0.08)
Year FE	yes	yes	yes	yes	yes
Industry x region time trends	no	no	no	yes	yes
R-squared	0.04	0.04	0.05	0.05	0.05
Observations	5822	5822	5822	5822	5822

*Source:* Authors's calculations using the Labour Force Survey and the database on negotiated wages by Istat.

**Table 3: Baseline results: non-compliance as a dummy - fixed effects, 2008-2015**

Fixed Effects estimates					
	(1)	(2)	(3)	(4)	(5)
Non-compliance	0.29*** (0.03)	0.30*** (0.03)	0.30*** (0.03)	0.41*** (0.02)	0.42*** (0.03)
Log wage floors		-1.20*** (0.30)	-1.26*** (0.30)	-1.58*** (0.19)	-1.59*** (0.27)
% young <35			0.14** (0.07)		0.13* (0.07)
% temporary emp.			-0.24*** (0.08)		-0.27*** (0.08)
% women			-0.08 (0.07)		-0.03 (0.07)
% immigrants ex-EU			-0.02 (0.15)		0.08 (0.16)
% emp. in SME			-0.14* (0.07)		-0.05 (0.07)
% low edu			0.12 (0.09)		0.17** (0.08)
Year FE	yes	yes	yes	yes	yes
Industry x region FE	yes	yes	yes	no	no
Industry x region time trends	no	no	no	yes	yes
R-squared	0.05	0.05	0.06	0.05	0.05
Observations	5822	5822	5822	5822	5822

Source: See Table 2.

**Table 4: Estimates augmented with the efficiency of the labour court, 2008-2015.**

Fixed Effects estimates				
	Duration continuous		Duration dummy if above 50 <sup>th</sup> percentile	
	(1)	(2)	(3)	(4)
Non-compliance (*100)	1.48*** (0.17)	1.04** (0.42)		
Non-compliance^2 (*100)	-0.02*** (0.00)	-0.02** (0.01)		
Non-compliance dummy			0.30*** (0.03)	0.23*** (0.07)
Non-compliance*Duration LC		0.23 (0.22)		
Non-compliance^2*Duration LC		-0.00 (0.00)		
Non-compliance dummy*Duration LC				0.04 (0.04)
Duration LC	-0.02 (0.03)	-0.04 (0.04)	-0.02 (0.03)	-0.05 (0.04)
Wage floors	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Industry x Regio FE	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
R-squared	0.05	0.05	0.06	0.06
Observations	5822	5822	5822	5822

*Source:* See Table 2.

**Table 5: Heterogeneity across sectors and regions, fixed effects estimates, 2008-2015**

Fixed Effects estimates								
	Manufacturing	Services	Manufacturing	Services	South	North	South	North
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Non-compliance (*100)	1.33*** (0.28)	1.54*** (0.26)			1.65*** (0.26)	1.30*** (0.22)		
Non-compliance^2 (*100)	-0.02*** (0.00)	-0.02*** (0.00)			-0.02*** (0.00)	-0.02*** (0.00)		
Non-compliance dummy			0.36*** (0.06)	0.30*** (0.04)			0.36*** (0.04)	0.24*** (0.03)
Log wage floors	-0.14 (0.57)	-2.00*** (0.44)	-0.12 (0.56)	-1.88*** (0.43)	-0.94* (0.53)	-1.45*** (0.36)	-1.14** (0.52)	-1.33*** (0.35)
Workers' and firm's controls	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Industry x region FE	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0,11	0,06	0.13	0.07	0.08	0.04	0.09	0.04
Observations	1604	3363	1604	3363	2391	3431	2391	3431

Source: See Table 2.

**Table 6: Estimates in crisis (2008-2009) and post-crisis years (2014-2015), fixed effects estimates**

Fixed Effects estimates				
	2008- 2009	2014- 2015	2008- 2009	2014- 2015
Non-compliance (*100)	1.45*** (0.35)	2.28*** (0.29)		
Non-compliance^2 (*100)	-0.03*** (0.01)	-0.03*** (0.00)		
Non-compliance			0.48*** (0.06)	0.54*** (0.05)
Log wage floors	-1.68*** (0.46)	-1.11*** (0.40)	-2.05*** (0.44)	-1.16*** (0.38)
Workers' and firm's controls	yes	yes	yes	yes
Year FE	yes	yes	yes	yes
Industry x Regio FE	yes	yes	yes	yes
Observations	1470	1418	1470	1418

*Source:* See Table 2.



## APPENDIX

**Table A.1: OLS estimates, 2008-2015.**

	<i>OLS</i>				<i>OLS (without zeros)</i>		
Non-compliance	-0.00**	-0.00**	-0.00	Non-compliance	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)
Log wage floors		-1.13**	-1.24***	Log wage floors		-0.94**	-1.13***
		(0.44)	(0.43)			(0.46)	(0.44)
% young <35			0.07	% young <35			-0.08
			(0.08)				(0.09)
% temporary emp.			-0.03	% temporary emp.			0.30**
			(0.11)				(0.13)
% women			0.15*	% women			0.21**
			(0.09)				(0.09)
% immigrants ex-EU			0.03	% immigrants ex-EU			-0.03
			(0.20)				(0.18)
% emp. in SME			-0.86***	% emp. in SME			-0.81***
			(0.08)				(0.09)
% low edu			0.37***	% low edu			0.64***
			(0.09)				(0.11)
R-squared	0.84	0.84	0.85	R-squared	0.85	0.85	0.86
Observations	5822	5822	5822	Observations	4620	4620	4620
F	718.45	708.95	668.36	F	646.88	644.24	558.45
p	0.00	0.00	0.00	p	0.00	0.00	0.00

*Source:* See Table 2.

**Table A.2: Fixed effects estimates using non-compliance dummies, 2008-2015.**

Fixed Effects estimates	(1)	(2)
Log wage Floors	-1.17*** (0.25)	-1.22*** (0.25)
Non-compliance >0% & <2%	0.36*** (0.04)	0.36*** (0.04)
Non-compliance >2% & <4%	0.32*** (0.03)	0.33*** (0.03)
Non-compliance >4% & <10%	0.33*** (0.02)	0.33*** (0.02)
Non-compliance >10% & <20%	0.33*** (0.02)	0.33*** (0.02)
Non-compliance >20% & <30%	0.31*** (0.03)	0.31*** (0.03)
Non-compliance >30% & <50%	0.27*** (0.03)	0.27*** (0.03)
Non-compliance >50%	0.10*** (0.04)	0.11*** (0.04)
R-squared	-0.08	-0.07
Observations	5822	5822
F	22.12	18.39
p	0.00	0.00

*Source:* See Table 2.

**Table A.3: Robustness: excluding one sector at the time, fixed effects 2008-2015.**

Fixed Effects estimates							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ALL	1	2	3	4	5	6
Non-compliance	0.416*** (0.0272)	0.422*** (0.0273)	0.407*** (0.0272)	0.413*** (0.0283)	0.406*** (0.0274)	0.416*** (0.0284)	0.413*** (0.0272)
Log wage floors	-1.592*** (0.269)	-1.526*** (0.292)	-1.532*** (0.269)	-1.561*** (0.269)	-1.126*** (0.258)	-1.610*** (0.268)	-1.626*** (0.270)
Observations	5,822	5,670	5,798	5,679	5,732	5,680	5,670
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	7	8	9	10	11	12	13
Non-compliance	0.399*** (0.0272)	0.420*** (0.0273)	0.413*** (0.0276)	0.414*** (0.0276)	0.417*** (0.0276)	0.420*** (0.0279)	0.416*** (0.0275)
Log wage floors	-1.583*** (0.269)	-1.555*** (0.271)	-1.746*** (0.271)	-1.561*** (0.270)	-1.572*** (0.270)	-1.601*** (0.268)	-1.652*** (0.271)
Observations	5,679	5,671	5,711	5,670	5,686	5,670	5,670
	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Non-compliance	0.421*** (0.0276)	0.425*** (0.0279)	0.427*** (0.0274)	0.432*** (0.0285)	0.413*** (0.0281)	0.419*** (0.0274)	0.428*** (0.0274)
Log wage floors	-1.631*** (0.270)	-1.557*** (0.271)	-1.692*** (0.287)	-1.586*** (0.274)	-1.590*** (0.268)	-1.657*** (0.270)	-1.418*** (0.273)
Observations	5,671	5,670	5,670	5,670	5,670	5,670	5,670
	(22)	(23)	(24)	(25)	(26)	(27)	(28)
	21	22	23	24	25	26	27
Non-compliance	0.418*** (0.0277)	0.415*** (0.0273)	0.419*** (0.0276)	0.416*** (0.0277)	0.405*** (0.0277)	0.421*** (0.0276)	0.418*** (0.0272)
Log wage floors	-1.502*** (0.283)	-1.437*** (0.270)	-1.543*** (0.269)	-1.604*** (0.283)	-1.662*** (0.270)	-1.588*** (0.269)	-1.491*** (0.270)
Observations	5,670	5,670	5,670	5,670	5,709	5,670	5,670

**Table A.3 continued: Robustness: excluding one sector at the time - fixed effect 2008-2015.**

	(29) 28	(30) 29	(31) 30	(32) 31	(33) 32	(34) 33	(35) 34
Non-compliance	0.405*** (0.0273)	0.431*** (0.0284)	0.397*** (0.0274)	0.422*** (0.0274)	0.406*** (0.0268)	0.415*** (0.0273)	0.417*** (0.0274)
Log wage floors	-2.243*** (0.241)	-1.584*** (0.273)	-1.373*** (0.265)	-2.011*** (0.271)	-1.568*** (0.281)	-1.801*** (0.281)	-1.558*** (0.270)
Observations	5,718	5,671	5,686	5,670	5,679	5,670	5,670
	(36) 35	(37) 36	(38) 37	(39) 38	(40) 39	(41) 40	(42) 41
Non-compliance	0.415*** (0.0273)	0.404*** (0.0283)	0.401*** (0.0269)	0.432*** (0.0279)	0.416*** (0.0272)	0.416*** (0.0272)	0.422*** (0.0276)
Log wage floors	-1.517*** (0.273)	-1.453*** (0.276)	-1.622*** (0.268)	-1.702*** (0.279)	-1.592*** (0.269)	-1.592*** (0.269)	-1.524*** (0.280)
Observations	5,670	5,677	5,683	5,670	5,822	5,822	5,670
	(43) 42	(44) 43					
Non-compliance	0.416*** (0.0273)	0.415*** (0.0272)					
Log wage floors	-1.583*** (0.275)	-1.551*** (0.270)					
Observations	5,670	5,670					

*Source:* See Table 2.

**Table A.4: Robustness: excluding one region at the time - fixed effects, 2008-2015**

Fixed Effects estimates							
Region	(1) ALL	(2) 1	(3) 2	(4) 3	(5) 4	(6) 5	(7) 6
Non-compliance	0.416*** (0.0272)	0.424*** (0.0280)	0.416*** (0.0272)	0.429*** (0.0280)	0.417*** (0.0286)	0.415*** (0.0279)	0.414*** (0.0284)
Log wage floors	-1.592*** (0.269)	-1.614*** (0.281)	-1.592*** (0.269)	-1.663*** (0.281)	-1.610*** (0.278)	-1.556*** (0.273)	-1.601*** (0.276)
Observations	5,822	5,501	5,822	5,498	5,507	5,512	5,510
Region	(8) 7	(9) 8	(10) 9	(11) 10	(12) 11	(13) 12	(14) 13
Non-compliance	0.428*** (0.0277)	0.416*** (0.0280)	0.417*** (0.0274)	0.423*** (0.0286)	0.408*** (0.0277)	0.418*** (0.0281)	0.407*** (0.0280)
Log wage floors	-1.621*** (0.275)	-1.603*** (0.275)	-1.603*** (0.272)	-1.562*** (0.276)	-1.586*** (0.278)	-1.627*** (0.280)	-1.640*** (0.276)
Observations	5,527	5,506	5,502	5,526	5,517	5,505	5,522
Region	(15) 14	(16) 15	(17) 16	(18) 17	(19) 18	(20) 19	(21) 20
Non-compliance	0.414*** (0.0281)	0.424*** (0.0279)	0.402*** (0.0270)	0.411*** (0.0288)	0.409*** (0.0279)	0.414*** (0.0279)	0.412*** (0.0277)
Log wage floors	-1.587*** (0.276)	-1.610*** (0.275)	-1.562*** (0.276)	-1.642*** (0.277)	-1.549*** (0.272)	-1.536*** (0.275)	-1.478*** (0.272)
Observations	5,553	5,515	5,511	5,526	5,534	5,509	5,515

Source: See Table 2.



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