Losing control? The Effects of "Pirate" Collective Agreements on Wages

Claudio Lucifora[*,1] and Daria Vigani[†,2]

[1]Università Cattolica di Milano, IZA and CNEL
[2]Università Cattolica di Milano

August 2019

Abstract[1]

The number of sector-level collective agreements signed by unknown organisations – the so-called "pirate" agreements – has increased dramatically in recent years. Regulatory uncertainty about social partners' representativeness contributed to this trend. In this paper, we use a matched employer-employee data from the Italian Social Security Archives with information on employees histories, firms' characteristics, and collective agreements, to investigate the labour market effects of "pirate" agreements. We find evidence of a significant dumping effect on wages associated with different types of non-representative collective agreements, compared to other firms with regular collective agreements, that is signed by the main unions and employers association. We estimate an average wage differential of 15%, half of which is due to selection effects – i.e. lower productivity workers employed in firms adopting "pirate" collective agreements. The negative effect on wages is shown to be partly driven by lower negotiated minimum wages and weaker labour standards, with significant differences by firm size and industry affiliation. Finally, we show that firms with "pirate" agreements are characterised, over the period considered, by a better employment performance compared to other firms, suggesting that "pirate" agreements may have been used by firms to gain downward flexibility in wage levels.

JEL classification: J52, J31, J41

Keywords: collective bargaining, collective agreements, representativeness, wage differentials

[*]Corresponding author: Department of Economics and Finance, Università Cattolica, Largo Gemelli, 1 (20123) Milan. e-mail: claudio.lucifora@unicatt.it

[†]Department of Economics and Finance, Università Cattolica, Largo Gemelli, 1 (20123) Milan. e-mail: daria.vigani@unicatt.it

1 Introduction

In most European countries, wages are set through collective agreements which are bargained between employer organisations and trade unions at different level of centralization. In countries where industry-wide agreements are common, collective bargaining determines wage levels and working conditions (such as, working time, training and other provisions) for most workers in the sector, through mandatory or *de facto* extensions. Typically, when the provisions of a collective agreement are extended beyond the boundaries of the firm, the representativeness of the negotiating parties is a necessary condition for the agreements to be recognised by firms operating in that industry. Since the mid-nineties, however, the representativeness of trade unions has fallen dramatically, as membership has halved and collective agreements cover a much smaller share of workers (OECD, 2018). Also employers associations have experienced a progressive erosion of their representativeness and falling coverage, as firms were dropping out from the main associations (Traxler, 2004). Regulatory uncertainty about measurement of social partners' representativeness also contributed to this trend. [2]

The Italian system of industrial relations also experienced similar patterns. In particular, over the last decade, uncertainty about the rules governing social partners' representativeness in collective bargaining, coupled with the fragmentation of unions and employers' associations, led to a massive increase in the number of sector-level collective agreements, most of which signed by unknown organisations (i.e. the so-called "pirate" agreements). Firms have also been shopping for collective agreements negotiated outside the boundaries of their main economic activity, simply to save on labour costs. Periodical reports by the National Council of Economics and Labour (CNEL) document an almost three-fold increase in the number of national collective agreements from 2005 onward (from less than 300 in 2005 to 800 in 2018), with less than one-third of currently filed collective agreements signed by the main unions and employers associations.

In this paper, we document the patterns and evolution of sector-level collective agreements in Italy and investigate the labour market effects associated with the increase in non-representative collective agreements, either signed by unknown social partners – "pirate" agreements –, or agreements misplaced with respect to the main economic activity of the firm – "mismatch" agreements –. We argue that the lack of a comprehensive and coherent regulation of social partners' representativeness paved the way to collective agreement dumping, and a "race-to-the-bottom" in negotiated minimum wages and other collective agreement provisions. We also find that firms applying "pirate" agreements,

---

[2]According to the European Commission, social partners' representativeness is regulated according to different rules: "in most countries mutual recognition is the basic mechanism, but [..] in other countries there are mechanisms (for example quantitative criteria established by law or otherwise) to make a distinction between organisations with (the most) substantial membership and those which are less representative" (European Commission, 1993).

with lower negotiated minimum wage levels, experience a better employment performance relative to firms with a regular collective agreement, that is signed by the main unions and employers association. While the more favourable trade-off in labour costs may have partially attenuated the negative impact of the financial crisis on employment levels, the overall effects of the increased fragmentation of collective bargaining and the weakening of work standards are still largely unexplored, along with their potential consequences on both job quality and industrial relations.

The evidence we study here bears important implications for the experience of European countries in which collective bargaining used to play an important role but, since the start of the crisis, has been increasingly under pressure. In particular, the downward rigidity of wage levels associated with the length of multi-period agreements, the scarce resilience to economic downturns and the low adaptability of contract provisions to structural change, all contributed to a growing dissatisfaction with the labour market performance associated to sector-level collective bargaining pushing firms to deliberately opt-out from higher-level agreements (Eurofound, 2010).

From a theoretical perspective collective bargaining represents an important feature of labour market equilibrium, affecting both monetary and non-monetary aspects of labour relations, as well as employment levels. Typically, the effects of collective bargaining strongly depend on how it is organized, by the degree of competition in the local labour market and the presence of monopsony power. Under different configurations, collective bargaining can introduce distortion in the allocation of factors, or can improve labour market efficiency by redistributing rents and solving coordination problems (Visser, 2013).

According to the early work of Calmfors and Driffill (1988), a hump-shaped relationship links the (de)centralization of wage-setting institutions and labour market performance. In that context, the worse configuration is the intermediate one, since it combines weak market discipline and low corporatism. While the hump-shaped hypothesis was later shown to lack robust empirical relevance (Bassanini et al., 2010), the strategic features underlying social partners interactions, when bargaining occurs at the level of the industry or region, are still a key feature of most bargaining models. In particular, when collective bargaining takes place at the industry-wide level, setting the standards for all firms in a sector, bargained wages are unlikely to respond to firms' productivity and the allocation of workers may be inefficient.

More recently, a number of contributions revived the debate opposing the efficiency of firm-level bargaining with industry-wide collective agreements (Boeri, 2014; Boeri and Burda, 2009; Jimeno and Thomas, 2013). In particular, Jimeno and Thomas (2013) show, in the context of a search and matching model, that when firms' productivity levels are heterogeneous, equilibrium (un)employment is likely to be (higher) lower under sector-level bargaining relative to firm-level bargaining. In other words, when sector-level wages deviate from firm-specific productivity, whenever the value of a job falls below a given pro-

ductivity threshold, workers cannot be profitably employed anymore. Conversely, under firm-level bargaining, since wage levels are more likely to reflect firm's productivity, even low productivity jobs can be preserved. Moreover, the lower expected profits associated with low-productivity jobs, under sector-level bargaining, also reduce the incentives to open vacancies relative to firm-level bargaining, which translates into lower hiring rates. Boeri (2015) has further explored the implications of multilevel bargaining systems, where the "two-tier" effects of sector-level and firm-level agreements become additive, thus combining the wage rigidity of sector-level bargaining with the firm-specific bargaining power of decentralised systems. Multilevel bargaining results in higher wage levels and a lower resilience to economic shocks.

Notice that in all these models, sector-level collective agreements impose externalities on less productive firms, destroying jobs and employment opportunities. In such context, bargaining clauses that allow low-productivity firms to "optimally" opt-out from higher-level agreements and pay a lower wage can achieve a more efficient allocation of jobs, lower unemployment rate but at a higher wage inequality.

This trade-off between wage inequality and unemployment has been extensively studied in the collective bargaining literature investigating the strategic behaviour of social partners and their objectives. What has received less attention is the political economy aspect of collective bargaining, that is: if sector-level bargaining generates such inefficient equilibrium allocations, why is it so diffused in many European countries? The traditional explanation is related to trade unions' preferences for egalitarian wage schedules and lower inequality. Under sector-level bargaining, firms and unions typically bargain over industry-specific wage levels that apply to all workers irrespective of the firm they are employed in, or *vis-à-vis* local labour market conditions. Thus, bargained wages are equalized across firms, "undercutting" of labour standards is prevented and earnings are relatively insulated from business cycle fluctuations (Freeman and Medoff, 1984). Yet why should firms agree to a common wage schedule for the whole sector, knowing that it is less efficient and likely to generate lower profits? Boeri and Burda (2009) argue that there are complementarities among labour market institutions, so that sector-level bargaining arises endogenously when employees are protected from dismissal by employment protection legislation.

Firms' strategic interactions, to reduce competition by raising rivals' overall labour costs, might be an alternative mechanism. In such context, incumbent firms might find profitable to bargain a wage level high enough to keep competitors out of the industry, but not too high to prevent them from making profits. In Haucap et al. (2001) the industry is modelled as being composed by a fixed number of large firms and a competitive fringe of small firms. Wage determination follows a Cournot-Nash behaviour with wages set at a "critical" level to keep entrants out. Any reduction in the sector-level wage is associated with a discrete jump in supply from entrants, thus leading to a drop in

profits. This set-up also explains the common practice of extending the provisions of collective agreements beyond the signatory parties – either mandated by governments or simply through a "de facto" extension – to all incumbent firms in an industry, and why firms resist any undercutting in wages or labour standards. The issue of compliance with wages and labour standards mandated by collective agreements is, of course, key to the above set-up (Ashenfelter and Smith, 1979). Garnero and Lucifora (2019) show that firms non-compliance behaviour – such as undercutting negotiated minimum wage levels or applying "pirate" collective agreements – is related to the probability of detection and the sanctioning costs which firms internalize in their optimizing decisions. However, Governments often "turn a blind eye", either softening monitoring or not sanctioning irregular practices, as a way to grant flexibility to, otherwise rigid, wages and preserve low productivity jobs.

The labour market effects of sector-level collective bargaining and extension clauses, to all workers in the industry, have been also extensively investigated in the empirical literature. A number of empirical studies have focused on the rigidity of sector-level wage bargaining (Avouyi-Dovi et al., 2013), on the distribution of wages (Cardoso and Portugal, 2005) and on rent sharing (Card et al., 2013; Devicienti et al., 2018). Other studies looked into the role played by collective bargaining systems in shaping employment and unemployment dynamics (Brändle and Goerke, 2018; Bryson and Dale-Olsen, 2008; DiNardo and Lee, 2004; Martins, 2014) as well as employer-specific wage differentials (Gürtzgen, 2009; Martins, 2009; Rusinek and Rycx, 2013). In general, most empirical studies find that under sector-level collective agreements wages are less resilient to economic shocks and more likely to translate into employment adjustments or working hours reductions (Izquierdo et al., 2017; Ronchi and Di Mauro, 2017). In particular, evidence from the European Central Bank's "Wage Dynamics Network" survey (WDNS) shows that countries characterised by sector-level and two-tier bargaining – such as France, Greece, Italy, Portugal and Spain – entered the financial crisis with significant downward wage rigidity. Wage inflexibility initially determined a disproportionately high adjustment in employment levels and growing unemployment rates. Countries under the European financial assistance program were strongly encouraged to reform their collective bargaining structure – Greece, Spain and Portugal did it – to gain resilience in wage levels face to high unemployment (Díez-Catalán and Villanueva, 2015). Other countries – such as Germany – during the crisis increased the decentralization of collective bargaining, which reduced unit labor costs dynamics to the benefit of employment levels and little or no increase in unemployment (Dustmann et al., 2014). In particular, Baumgarten and Lehwald (2019) show how import exposure over the crisis increased the probability of German firms dropping-out from industry-wide collective agreements. Despite mounting pressure from international institutions [3], Italy did not reform its structure of bargaining, which re-

---

[3]In August 2011 the President of the ECB sent a letter to the Italian Government urging "[the] need

mains virtually unchanged from the early '90s. Confronted with its rigidity, the limited diffusion of firm-level bargaining, as well as industrial crises and high unemployment, the system of industrial relations went through a progressive fragmentation of social partners and dramatic increase in the number of collective agreements (European Commission, 2016).

Our study contributes to the above literature in a number of ways. First, we describe the institutional weakness and regulatory uncertainty that, in the Italian context, paved the way to the uncoordinated increase in the number of national collective agreements, and we document their distribution across agreement types and industries. Second, we use a large matched employer-employee longitudinal dataset to estimate the wage differential associated with "pirate" agreements, both along the wage distribution as well as across selected industries. In the empirical analysis, we account for the non-random allocation of workers across firms and collective agreements, and estimate a fixed-effect model to control for jobs and workers unobserved heterogeneity. We complement the above data with information on the minimum wages defined in a number of collective agreements signed by the most representative unions and employers associations to compute firms' minimum wage non-compliance. Finally, we run a counterfactual exercise exploiting the onset of the economic crisis, to assess the effect of "pirate" agreements on labour market outcomes, where we compare the employment performance of firms applying a non-representative collective agreement with that of other firms applying a regular collective agreement.

We find that the wage levels of workers covered by a "pirate" collective agreements are on average 14% lower compared to those of workers with a regular collective agreement. We show that half of the wage differential associated to "pirate" agreements is due to selection effects, that is lower productivity workers who are more likely to be employed in firms with a "pirate" agreement. Also "mismatched" collective agreements are associated with a negative wage differential which is smaller in magnitude (-5%). In general wage levels in firms with non-representative agreements are driven downwards by lower negotiated minimum wages and weaker labour standards in terms of variable pay, overtime premia and other economic provisions. Firms with a "pirate" collective agreements also have a 8% higher probability of not complying with the minimum wages – for the least skilled employees – set in collective agreements signed by main unions and employer

---

to further reform the collective wage bargaining system allowing firm-level agreements to tailor wages and working conditions to firms' specific needs and increasing their relevance with respect to other layers of negotiations". In 2015 a further recommendation followed from the ECB: "To enhance the resilience of the economy to shocks, wages must appropriately reflect labour market conditions and productivity developments, which underlines the importance of reforms conducive to greater wage flexibility and differentiation across workers, firms and sectors.". Also the European Commission warned the Italian Government that "[*centralized bargaining*] hampers the development of innovative solutions at firm level that could improve productivity and foster the response of wages to labour market conditions."

organisations. Significant differences also exist by firm size, occupation and industry affiliation both in terms of diffusion of "pirate" agreements, as well as wage penalties. Finally, we show that firms with a "pirate" agreement, compared to other firms, experienced a better employment performance over the economic crisis. This finding is in line with the theoretical prediction suggesting that opting-out from collective agreements may be used by firms to gain downward flexibility in wage levels.

Our paper also contributes to the more general debate concerning the economic effects of social partners' representativeness in wage bargaining. While much empirical research has been devoted to the effects of unions and collective bargaining on labour market outcomes, less attention has been devoted to the implications of bargaining pluralism and freedom of association relative to collective agreement dumping, employer's non-compliance and other unfair bargaining practices of firms.

The rest of the paper is organized as follows. In the next section, we briefly describe the institutional setting. Sections 3 and 4 present the main dataset and discuss descriptive evidence on non-representative agreements and wage differentials, as well as the empirical strategy adopted. In Section 5 we present the main results, while concluding remarks are provided in Section 6.

2 Industrial relations in Italy

The whole system of industrial relations in Italy is centred around the role of the most representative employers and workers' organisations, that operate within a relatively weak legal regulation to set both the structure of collective bargaining and the regulation of collective agreements. [4]

2.1 Collective bargaining

Collective bargaining in Italy is characterized by a two-tier structure. The first tier (*Contratti Collettivi Nazionali di Lavoro* - CCNL) sets minimum wages schedules and work standards at the sector-level, and is targeted to preserve the purchasing power of wages (i.e. targeted to inflation). The second tier, at the decentralised level (firm or local), negotiates additional components of wages and other regulatory aspects, and is linked to firm's economic performance.

A collective agreement in Italy is only binding for the social partners signing the contract, while there are no formal extension mechanisms to workers employed in firms that are not associated to an employers' organisation. An indirect extension clause, however,

---

[4]Trade union density has experienced a moderate decline since the 1990s, and it is estimated to be around 30-40% in the private sector (Visser, 2015). Employers organisation density is estimated to be around 50%, though lack of information make any estimate about membership and representativeness more uncertain.

exists (a *de facto erga omnes* extension), as Labour Courts often use the wage minima determined in collective agreements (signed by the comparatively most representative social partners) as reference with the provision of Art. 36 of the Italian Constitution.[5] Firm-level agreements, in general, are not allowed to deviate from minimum standards set in the national collective agreements in a way which would be unfavourable to employees (i.e. the so-called favourability principle applies as national collective agreements cannot be derogated *in pejus*). Later framework agreements introduced the possibility for local-level bargaining to derogate from higher-level agreements (Art. 8 Decree N. 138/2011, converted into Law N. 148 of 2011) in areas of economic distress to preserve employment levels, improve job quality, fight undeclared work, etc.. (D'Amuri and Giorgiantonio, 2014).[6] Even if, formally, wages set in sector-level collective agreements cannot be derogated, in practice there is a high rate of employers' non-compliance. Even leaving aside irregular employment and workers hired in the informal sector, firms often force employees to work unpaid extra hours, they assign workers to lower occupational levels to underpay them, and when different collective agreements are potentially applicable they resort to loopholes and misclassification to pay lower wages. Finally, "pirate" collective agreements, signed by unknown employers and trade unions, often set minimum wage levels and other work standards below the existing ones.[7]

2.2 Actors, representativeness and collective agreements

Within the aforementioned collective bargaining structure, that lies on mutual recognition by social partners, there are no clear and certified rules governing who is entitled to bargain. Unlike in the public sector, where since the late 1990s representativeness criteria for trade unions' are clearly stated (DLgs No. 396/1997 and 165/2001, Art. 43), in the private sector there are no certified rules on partners' representativeness. In the present context, regulatory uncertainty, fragmentation of social partners and the lack of transparency for the assessment of representativeness in collective bargaining contributed to increase tensions between employers and trade unions. As a result, a number of large Italian companies (FCA-Fiat Chrysler Auto, Marcegaglia, Luxottica, just to name a few) have dropped their membership with their respective employers' organisations to gain further flexibility compared to national sector-level agreements, or in order to sign company-level agreement with different provisions. Since then, a lively debate concern-

---

[5]Art. 36 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".

[6]Derogatory clauses are allowed on a temporary basis and for a limited number of issues, such as: hours, occupational classification and fixed-term limits, while wages, for example, could not be derogated.

[7]The extent of violation differs across industries, from 8% in transport, to over 40% in Hotel and restaurants. On average, around two tenth of the workers are paid less than the minima established in collective agreements.

ing the need certified parameters to assess representativeness of social partners led to a number of framework agreements signed by the main trade unions and employer organisations (June 2011, May 2013 and January 2014). These agreements establish that a trade union needs to reach a 5 percent membership threshold to be considered as *representative* and able to take part in national collective bargaining, whereas an agreement is binding if signed by unions representing at least 50%+1 of the relevant workforce (Leonardi et al., 2017). [8] Conversely, there are no rules, nor agreements reached, on how to assess representativeness of employers' organisations.[9]

Within the present legal framework, each self-proclaimed "representative" association, by exploiting loopholes and misclassification in the regulation, can negotiate and sign a national collective agreement – that is successively filed within the CNEL's archive –, even in industries already covered by other pre-existing collective agreements.[10] This uncertainty about social partners' representativeness in collective bargaining and which agreement should a firm apply, contributed to an unprecedented increase in sector-level collective agreements signed by smaller unions, without real representation, and by compliant employers organisations.

The total number of national collective agreements currently registered at CNEL is approximately 800, almost three times more compared to 2005 (i.e. when less than 300 agreements were registered). The left panel of Figure 1 reports the evolution of the total number of collective agreements from 2005 to 2014. The breakdown shows an uneven growth across industries, with Retail trade, Construction and Personal services being the industries with the largest increases (right panel of Figure 1).

This rise in the number of "pirate" collective agreements was mainly driven by the intention to deviate from the economic and regulatory provisions of regular national collective agreements, signed by the main union confederations (CGIL, CISL and UIL) and the largest employers' associations (Confindustria, Confapi, Confcommercio, Confesercenti, CNA and few others) represented at CNEL.[11] Notice that, while there is much speculation about which have been the main driving factors behind the increase in the number of collective agreements and the diffusion of "pirate" collective agreements, it should be remembered that in the period under investigation the Italian economy was

---

[8]While the agreement is not yet operational, this threshold should be computed as a weighted average between the votes obtained in works council elections and membership. Membership data are collected by INPS, while election results are to be collected by CNEL.

[9]Currently the discussion involves the criteria used in the definition of employers' membership to the Chamber of Commerce such as the number of affiliated firms, total number of employees, share of industry value added and participation in bilateral bodies.

[10]A central role in the process of certification of representativeness has been attributed to CNEL, though without providing the Council with the power to proceed to arbitration or enforce a majoritarian rule for the decisions.

[11]The Budget Law 2016 (art. 1, Law n. 208, 28 Dec 2015) introduced generous financial incentives within firm-level (and local-level) bargaining. This further contributed to the increase in the number of sector-level collective agreements, since lower-level agreements are subordinate to these.

Figure 1   Number and sector-level distribution of collective agreements

Number of Collective Agreements   Trend in sector-level collective agreements
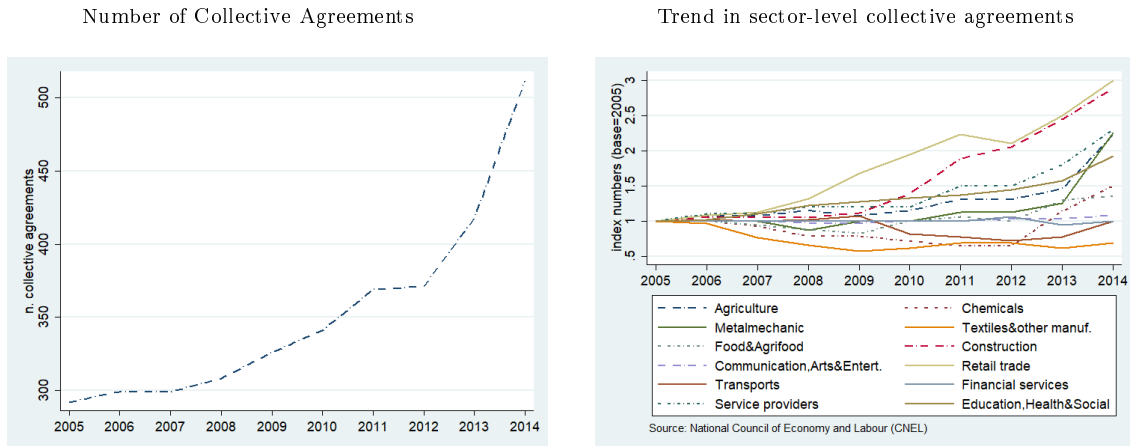
severely hit by negative demand shocks which affected firms' survival rates and their need to adjust labour costs to preserve employment. In particular, firms with more than 15 employees, due to the high firing costs (Art. 18 of the *Statuto dei lavoratori*), massively resorted to several different margins of adjustments, such as: fixed-term labour contracts, short-time insurance schemes (i.e. Cassa Integrazione Guadagni - CIG), delayed renewal of expired collective agreements and also to "pirate" collective agreements (see Table A1).

3   Data and descriptive statistics

Data are drawn from longitudinal matched employer-employee administrative archives collected by the Italian Social Security (INPS). Our sample is based on the working histories of a 1/90 random sample of private sector employees, and the firms they are employed in, over the period 2005-2014. The data contain information on demographic characteristics, gross annual earnings for each job spell, working weeks/days, type of contract and occupation, and firms' attributes. Moreover, we have information on the specific collective agreement that the firm applies. In practice, firms are required to file (monthly) a contributory statement indicating the numerical code associated to each of the coded collective agreement. Notice that unknown collective agreements, signed by non-representative unions and employers' organisations, are coded by INPS with the label "different contract". Out of the total number of collective agreements registered with CNEL, only 34% of them are registered and coded by INPS. While this indicates that the majority of the collective agreements are to be considered as "pirate" agreements, yet the agreements coded by INPS cover approximately 99% of existing firms and 98,4% of employees, suggesting that "pirate" agreements only concern a small share of employees.

In the empirical analysis, we focus on a sample of employees aged 20 to 60, working

in the private sector[12], with positive earnings between 2005 and 2014.[13] Employees' wages are defined as gross weekly earnings (alternatively we also use daily earnings).[14] Individuals with multiple job spells, within the same year, enter the sample with the most representative spell in terms of weeks. Our final sample consists of 1,474,891 workers (9,078,834 observations) and 1,036,408 firms. The average worker is a 39 years old blue-collar, employed with a full-time open-ended contract and working in a very small firm (15 employees or less).[15] We also complement the above data with information on collective agreements drawn the CNEL's archives[16], and with the minimum wage as defined in the collective agreements signed by the main unions and employers organisation.

In order to investigate the labour market effects associated with non-representative collective agreements, we classify the agreements employers use according to different criteria. The first criterion considers whether or not the collective agreement applied by the firm is signed by main employers and trade unions organisations and coded by INPS.[17] The criterion of the main signatory parties is conventionally used by the supervising bodies (INPS, INL and Ministry of labour) for the correct application of collective agreements in terms of social security contributions, health and safety standards, anti-corruption and anti-laundering measures, etc.[18] Notice that collective agreements not coded by INPS are by definition unknown and classified as *"pirate" agreements*. The second criterion refers to sector-level collective agreements that employers use for their employees, but are negotiated outside the firm's main economic activity. These agreements, while being signed by representative social partners and coded by INPS, are misaligned with respect to the firm's type (i.e. large industrial firms, SMEs, cooperatives and craft-work firms) and the industry in which the firm is operating. In other words, these are collective agreements that employers select and apply just to save on labour costs. An example would be a large firm that applies the collective agreement of craft-work firms (while not being registered as craft-work enterprise), or a firm operating in the metalwork industry and applying the collective agreement of the retail trade industry.[19]

---

[12]We exclude public administration and defence, as well as extra-territorial organisations. Moreover, we drop all observations for individuals working in the private sector but employed under a public administration collective agreement.

[13]We exclude years before 2005 as the previous classification of collective agreements was significantly different and information was largely incomplete. We also exclude aberrant values in gross annual earnings and working weeks/days trimming the 1st and 99th percentiles.

[14]Results are robust to the use of daily wages, see Table A3.

[15]Sample descriptive statistics are provided in Table A1 in the Appendix.

[16]Archivio Nazionale dei contratti collettivi di lavoro - https://www.cnel.it/Archivio-Contratti

[17]Notice that all collective agreements have to be registered with CNEL by Law (L. 936, art. 17 del 30 dicembre 1986).

[18]While, as already discussed, there are no certified criteria for the definition of representativeness of social partners, different public bodies adopt for their supervision activities the criteria set by the Law which refer to the collective agreement "comparatively most representative" *comparativamente più rappresentativo sul piano nazionale*.

[19]We use 2-digit NACE rev.1 classification of economic activity to define 12 sectors, based on the 12 contractual sectors defined by CNEL and delimiting the scope of collective agreements: Agriculture

Based on the above criteria, we group the collective agreements according to three main categories:

1) *Most Representative Collective Agreements (MRCA)* - these are collective agreements signed by the "comparatively most representative" social partners within the relevant industry, firm's type and occupational categories covered;

2) *Mismatch Collective Agreements(MCA)* - these include sector-level collective agreements that are negotiated outside the boundaries of firm's main economic activity[20];

3) *"pirate" agreements, (*PCA*)* - these are collective agreements signed by unions and employers' organisations that are unknown to INPS, or refer to situations in which the worker is employed without any contract.

As an illustrative example, in Table A2 in the Appendix, we provide a list of all collective agreements – in a selected number of industries – classified as *MRCA*, or alternatively *MCA* and *PCA*, along with the share of firms and workers covered.

(insert Table 1 here)

Following the above definitions, Table 1 presents the distribution of the different types of collective agreements within each sector of economic activity for the most recent year, 2014. Overall, 75% of workers are employed with a *MRCA*, while *MCA* and *PCA* cover respectively 23.5% and 1.3% of the employees. *MRCA* cover more than 70% of workers in all but three industries: Agriculture, Construction and Media, communication& art. However, while in the Construction industry the share of workers covered by *MRCA* is well above 50%, in Agriculture and Media, communication& art the share of *MRCA* is much lower (47% and 37%, respectively).[21]

A first descriptive evidence on the wage differential between regular collective agreements (*MRCA*) and a non-representative agreement (*NRCA*) – either *PCA* or *MCA* – is presented in Figure 2. We compute the wage differential, at different quantiles of the wage distribution, estimating simple quantile regressions, separately by industry, and controlling for a set of job and firm characteristics. [22] The evidence shown reports the

---

[NACE 01 and 02], Chemicals [NACE 10 to 14, 23 to 25], Metalmechanic [NACE 27 to 35], Textile and other manufacture [NACE 17 to 20, 36], Food and Agrifood [NACE 05, 15 and 16], Construction [NACE 45 and 26], Communication, Arts and Entertainment [NACE 21, 22, 72 and 92], Retail trade [NACE 50 to 52, 55, 70, 71, 73, 74, 91 and 93], Transports [NACE 60 to 63], Financial services [NACE 65 to 67], Service providers [NACE 37, 40, 41, 64 and 90] and Education, Health and Social work [NACE 80 and 85].

[20]This is mainly the result of firms "shopping" to select the most convenient collective agreement in terms of labour costs, irrespectively of the firm's main sector of activity.

[21]Notice that the media, communication& art industry is typically characterized by significant heterogeneity in the range of economic activities across firms and by a huge number of collective agreements (currently 40), so that the share of agreements that fall into the *MCA* category is larger. Conversely, the relevant fraction of *MCA* found in agriculture is mainly consisting of collective agreements that fall outside the boundaries of the industry, i.e. agreements in the *Food & Agrifood* industry.

[22]The set of covariates included in the estimation of quantile regressions is the full set used in our

12

percent deviation taking as reference the level of wages set in regular collective agreements (i.e. red dotted-line). A negative wage differential for *PCA* agreements is estimated across all industries. Wage penalties are particularly pronounced at the bottom of the wage distribution and slowly converge as we move up the quantiles. Interestingly, some industries with only a limited number of "pirate" agreements exhibit sizeable wage penalties, suggesting that such agreements deviate significantly in terms of minimum wage standards.

Figure 2 Differentials between *MRCA*, *MCA* and *PCA* along the earnings distribution
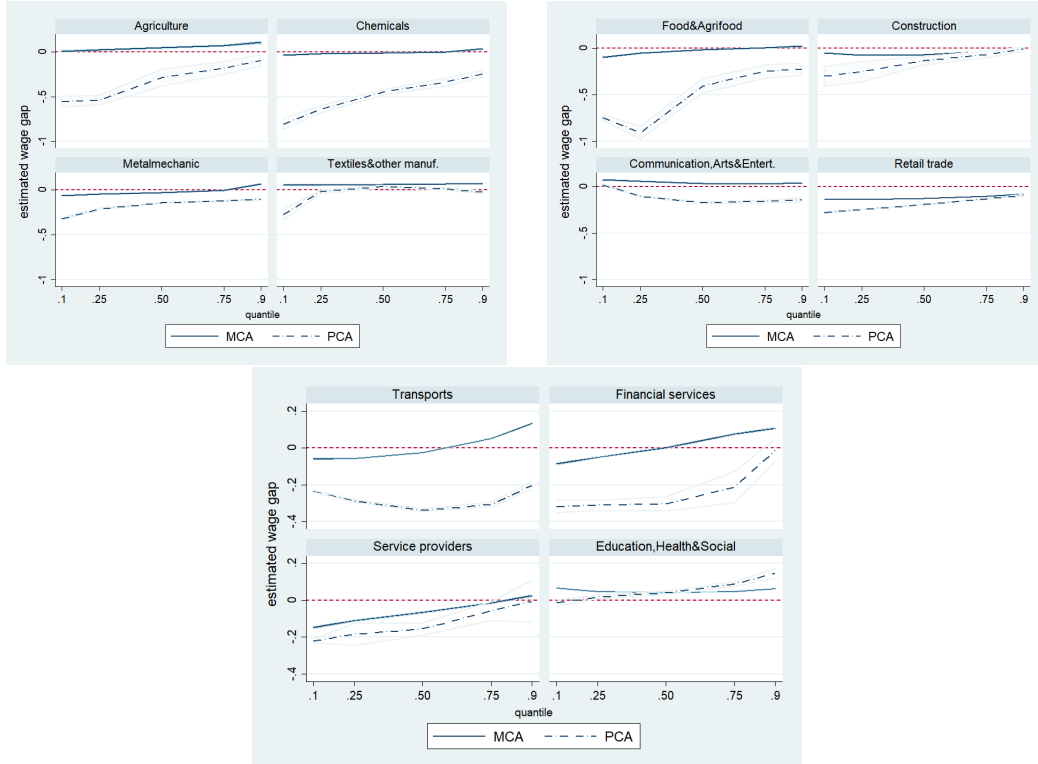
Conversely, estimated wage penalties for *MCA* at lower quantiles are smaller in size and generally not statistically different from wage levels set in regular agreements.[23]

4 Empirical strategy

In the empirical analysis, to estimate the wage differential associated with a broadly defined non-representative collective agreement (*NRCA*), we specify and estimate a simple earnings equation, for the 2005–2014 period. In the baseline specification, we regress the log of weekly nominal wages on a rich set of controls for worker, job and firm characteristics, a binary variable indicating whether the worker is covered by a non-representative agreement, and we also include time and worker fixed-effects, to control, respectively, for

---

baseline model, presented in Section 5.1.

[23]In few cases, as in Financial services, wage levels set in *MCA* even exceed *MRCA's* wages at the top of the distribution (see Figure 2).

common time shocks and time-invariant individual unobserved heterogeneity. In practice, we specify the following earnings equation:

$$logY_{it} = \beta\text{NRCA}_{it} + X'_{it}\gamma + \alpha_i + \delta_t + \epsilon_{it} \qquad (1)$$

where $logY_{it}$ is the log of weekly nominal wages of worker i in year t; NRCA_{it} is a dummy variable that takes value 1 when the worker is covered by a *NRCA*; X_{it} is a vector of demographic, job and firm characteristics[24]; α_i and δ_t are, respectively, worker and time fixed-effects while ϵ_{it} is the error term.[25] In our preferred specification standard errors are clustered at the worker level, to account for serial correlation within i. In an alternative specification, with individual-job fixed-effects, we cluster errors at the firm and job match level, as errors may be correlated across individuals within a firm-specific job match.[26]

Notice that, if workers' unobserved characteristics are correlated with the type of collective agreement, simple least squares estimates of equation (1) would be biased. In other words, if low productivity workers are more likely to be employed in (and covered by) firms that apply a non-representative collective agreement (in which wages are systematically lower), the presence of positive selection in the unobservables would tend to overestimate the effect of *NRCA* on earnings. To account for this selection effect, we include in our specification (time-invariant) worker fixed-effects.[27] However, an additional threat to the estimation of the effects of non-representative agreements on earnings might come from (time-varying) shocks that affect both the allocation of workers to less productive firms, as well as their probability to opt-out and apply a "pirate" agreement. Lacking a valid instrument, we address the above issue including in the specification of equation (1) job-match fixed-effects and industry-specific time trends.[28] In this setup, we identify the wage outcomes of employees who move job and type of collective agreement, within the same firm (or who switch to a new firm with a *NRCA*).

Using equation (1) as our preferred specification, we first estimate the gross earnings differential for workers covered by any type of *NRCA* compared to those covered by *MRCA*. Second, to disentangle the *"mismatch" effect* of sector-level collective agreements

---

[24]The vector of controls includes age (and its square), regional dummies for place of work, occupational dummies (white collar, blue-collar, apprentice or other job title), a dummy for part-time work, type of contract (open-ended, fixed-term and seasonal), firm size (≤ 15 employees, $16 - 50$, $51 - 300$, > 300) and industry-level dummies (ATECO2002 recoded into 12 categories according to sector-level collective agreement classification).

[25]In the robustness we also experiment a more flexible specification with worker-job fixed effects. In other specifications, to control for industry-specific time-varying factors, we include industry time trends. See Section 5.3 and Table A4.

[26]See Section 5.3 and Table A5.

[27]As long as unobservables take the form of time-invariant effects the inclusion of worker fixed-effects in the regression delivers consistent estimates.

[28]We report the results in Table A4 of the sensitivity check section (5.3).

that are negotiated outside the firm's main sector of economic activity (*MCA*), from the *"pirate" effect* of agreements signed by unknown unions and employers organisations, we estimate equation (1) including both MCA_{it} and PCA_{it} dummies. Third, we explore heterogeneity in collective agreements wage differential and estimate equation (1) separately by industry, firm size and occupation (blue and white-collars). Finally, we investigate the effect of *MCA* and *PCA* on other labour market margins such as firms' compliance with negotiated minimum wage levels (Section 5.2), as well as with respect to employment levels (Section 5.4).

5   Results

5.1   The wage effects of "pirate" collective agreements

In this section, we report the estimates of earnings differentials for workers covered by non-representative collective agreements compared to other workers. The main set of results are obtained fitting different specifications of our baseline model (equation (1)) and estimated both by simple OLS and by linear fixed-effect estimator. The main results are shown in Table 2, where we report the coefficient estimates of our variables of interest: a *NRCA* dummy which pools both types of non-representative agreements (columns 1 and 3), and separate dummies for *MCA* and *PCA* (columns 2 and 4). In the main specification, we include demographic controls, job and firm characteristics, as well as regional dummies for place of work and year fixed effects. Our overall estimates of the pooled *NRCA* dummy show a gross earnings differential of about -5%, suggesting that employees covered by any non-representative collective agreements receive lower wages compared with employees covered by a regular agreement. When the coefficients of *MCA* and *PCA* are estimated separately, the earnings differential associated to "pirate" agreements is three times larger (-15%) compared to *MCA* (-4.6%), supporting the idea that wage levels and other provisions negotiated in "pirate" agreements significantly deviate from regular collective agreements. Also, it indicates that firms that apply sector-level agreements negotiated in a different industry from their main activity do so to pay lower wages.

(insert Table 2 here)

Results from the fixed-effects estimator confirm the regulatory loopholes of the above findings. Employees who move from being covered by a representative collective agreement to a non-representative agreement earn lower wages: the estimated differential associated to the *NRCA* dummy is -4%. When the effects of the different agreements (*MCA* and *PCA*) are estimated separately the earnings differential are -3.7% and -8% respectively. Hence, consistent with the hypothesis that low productivity workers are more likely to be employed in firms that apply "pirate" collective agreements (*positive*

selection), we find evidence that OLS estimates are biased upwards and overestimate the effect of "pirate" agreements on earnings.

Overall the above results confirm that concerning both social partners' representativeness and the (correct) application of collective agreements have allowed firms to engage in collective agreements' dumping by either lowering work standards or selecting agreements that offer lower costs.

A significant heterogeneity in the earnings differentials associated to *NRCAs* is also found across several dimensions, such as firm size, occupation and industry.

(insert Table 3 here)

In Table 3, we show that large earnings penalties are associated with *MCA* and *PCA*, with smaller firms and blue-collar employees suffering the largest penalties. In particular, we report a gradient in firm's size earnings differentials ranging from -9% (*PCA* in firms with less than 15 employees) to -2% (*MCA* in larger firms). Not surprisingly blue-collar workers show the largest earnings differential, since the dumping effects of "pirate" agreements mainly affect low-skilled workers with poor bargaining power and their work provisions, such as: variable pay, overtime compensation, allowances for shift-work and sick leave, annual leave etc.[29]

<div align="center">Figure 3 Heterogeneity - by industry</div>
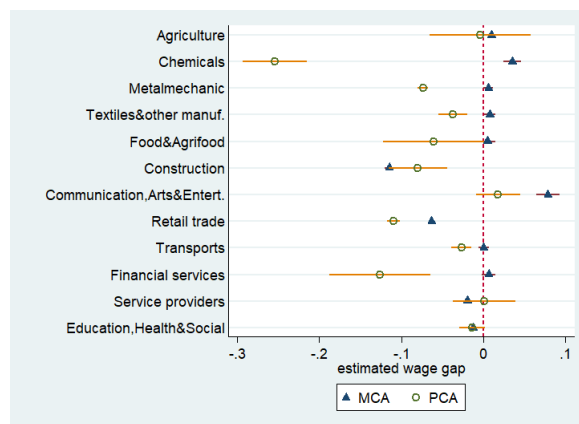
Also sizeable earnings differentials by collective agreements' type are estimated across different industries. Results are reported in Figure 3.[30] We find that "pirate" agreements in industries such as Chemicals, Retail trade and Financial services exhibit earnings penalties close to 15% on average, while Metalwork, Textile, Transport and Service providers exhibit smaller penalties.[31]

---

[29]As an example, consider that in the collective agreements signed by the main trade unions (CGIL, CISL, UIL and UGL), overtime work is compensated with a 20 to 25% premium for the first 2-3 hours and 30 to 50% for the following hours, while in most *NRCAs* overtime compensation does not exceed 15% of the base pay.

[30]The Figure presents the coefficients obtained estimating equation (1) separately by industry along with 95% confidence intervals.

[31]For example, the 12% negative earnings differential detected in Retail trade is associated with a

5.2 Firms' non-compliance

The increase in the number of "pirate" agreements and the progressive erosion of bargaining power, as previously discussed, also brought forward an increase in firms' non-compliance with *MRCAs'* sector-level minimum wages. While in the previous analysis we investigated the overall effects of *NRCAs* on earnings levels, here we compare the wage levels at the bottom of the distribution with the minimum wage determined in the most representative collective agreements (*minimi tabellari*). In particular, while *NRCAs* most often deviate from a number of provisions offered by the most representative collective agreements (such as with variable pay, overtime compensation, allowances for shift-work and sick leave, annual leave, etc.), another margin of non-compliance found in "pirate" agreements is that a non-negligible share of employees, within the firm, is paid less than the minimum wages set in sector-level collective agreements for the lowest occupational category (the so-called *minimum minimorum*). It is useful to recall, as discussed in Section 2.1, that firms are mandated by law (for the purpose of social contributions and fiscal benefits) to pay the minimum wage levels set in collective agreements negotiated by the most representative unions and employers organisation. Notice that in this context, firms' non-compliance is targeted specifically to low paid workers (low-skilled and less-experienced), with strong implications for the diffusion of working poverty. Recent empirical evidence for Italy shows that around 15% of workers are paid less than the minimum wage set in *MRCAs*, and that non-compliance tends to be higher in those sectors where the "bite" of the negotiated minimum wage is higher compared to median wages – i.e. the Kaitz index (Garnero, 2018; Garnero and Lucifora, 2019). In this section, we use data on negotiated minimum wages, drawn from 90 collective agreements regularly monitored by ISTAT[32], to investigate the relationship between firms' non-compliance behaviour and "pirate" agreements.[33]

In practice, using a fixed-effect linear probability model (LPM), we estimate the likelihood that workers covered by a *NRCA* (and *MCA*, *PCA* respectively) receive a wage below the minimum wage threshold set in the relevant sector-level collective agreement. We then replicate the above estimation separately for large and small firms (less than 15 employees).[34]

---

large (currently 64) and increasing number of collective agreements, the majority of which are classified as *pirate* agreements.

[32]ISTAT collects information on negotiated wages before taxes and transfers (also including 13th or 14th monthly payment, while performance-related-pay, seniority or other type of payments are not included). Minimum wage levels are classified according to 2-digit NACE rev.1, which we use in the matching with the INPS data.

[33]See Garnero and Lucifora (2019).

[34]Since the inclusion of individual fixed effects does not provide consistent estimates for binary choice models with panel data, given that unobserved time-invariant heterogeneity is likely to be a relevant issue in our model, we estimate minimum wage compliance through a linear probability model. While a viable alternative could be that of estimating a conditional logit fixed-effects (CLFE) model, such option is not ideal in our case due to the computationally intensive requirements with big data, and the strong

(insert Table 4 here)

Overall, non-representative collective agreements are associated with a 3% increase in the probability of non-compliance with the sector-level negotiated minimum wages for the least-skilled occupation, that rises to 8% when the worker is covered by a *"pirate"* agreement. The probability of firm's non-compliance is evenly distributed between small and large firms, with estimated non-compliance of comparable magnitudes.[35]

5.3   Sensitivity analysis

We perform a number of sensitivity analyses to check the robustness of our main findings against alternative specifications and samples. First, we replace weekly with daily earnings as dependent variable.[36] We re-estimate our baseline model with log daily wages and show that the wage differentials associated with non representative collective agreements are comparable (see Table A3).

Second, we test the sensitivity of our estimates to unobservable time-varying, industry-specific characteristics. Including a more flexible specification, with industry time trends, results are virtually unchanged.

Moreover, as an alternative way to control for selection effects (i.e. low-productivity employees sorting into firms that apply non-representative agreements), we re-estimate equation (1) including job-match fixed-effects. Notice that with this specification, we identify the effect on earnings differentials for a selected group of employees who move job from a regular collective agreement to a non-representative agreement within the same firm (or to a newly born firm with a non-representative agreement). Results from this exercise are presented in Table A4 in the Appendix, along with the baseline estimates for comparison purposes. The estimated coefficient on the PCA dummy is smaller in magnitude, while that on the MCA dummy is not statistically significant, thus confirming previous findings showing that part of the effect originates from workers' unobserved characteristics that are correlated with being covered by a non-representative agreement.

Third, in our baseline model we have clustered standard errors within i, however, since errors might also be correlated across workers within the same firm (or job-match), we replicate our estimation exercise using alternative clustering rules. Results are virtually

---

reliance on functional forms. We also experimented a random-effects logit model. Results, not reported here, are comparable.

[35]The estimated effect of non-compliance across industries also closely mirrors the wage penalties estimated above. We find a larger effect of "pirate" agreements on non-compliance (around 9%) in selected industries, such as Chemicals, Retail trade and Financial services. Conversely the mismatch effect of MCA shows a statistically significant impact on firms' non-compliance only in Retail trade and Construction industries (around 4 to 8%), where the Kaitz index is relatively high compared to other industries. Results, not reported here, are available upon request.

[36]Notice that since paid weeks refers to weeks in which the employee has worked at least one day, daily wages might be a more precise measure of earnings.

unchanged, even though standard errors clustered at the firm level are slightly larger than those at the individual level, suggesting that part of the residual variance is shared across workers.

Finally, to assess the sensitivity of our estimates to a specific event – i.e. FCA decision, in 2011, to opt out of the national metalwork collective agreement for a firm-level agreement (up to 86,000 covered employees) –, we re-estimate our baseline model excluding all firms in the metalwork industry. Results without metalwork firms show a larger estimated coefficient on PCA suggesting that "pirate" agreements in the industry (such as FCA's) offer wage levels in line with regular agreements.

5.4 "Pirate" collective agreements and labour market outcomes: a discussion

The empirical analysis presented so far has focused on the potential wage outcomes for employees covered by different types of collective agreements. The main results indicate that non-representative collective agreements appear to be associated with lower wages, and with a higher probability of employers' non-compliance with respect to the minimum wage set in $MRCA$. Also, employees' unobserved characteristics have been shown to correlate with the type of collective agreement, as low-productivity individuals appear more likely to be covered by "pirate" agreements. This, as previously discussed, suggests that regulatory uncertainty and loopholes concerning the rules for representativeness in collective agreements are used by employers to deviate from the application of the main collective agreements, to save on labour costs and gain flexibility in wage levels. In this section, we analyse which firms are more likely to apply non-representative collective agreements to their employees, and what are the main implications of firms' "shopping" for the most convenient agreement.

We use information from INPS data, at firm-level aggregation, to provide descriptive evidence on the probability that firms apply a regular or a "pirate" agreement along two main dimensions: the firm's economic activity and its size. In practice, we estimate an ordered probit model where the dependent variable is an ordered indicator defined as follows: 1 if $MRCA$, 2 if MCA and 3 if PCA. We then use the (conditional) predicted probabilities of adoption of non-representative agreement (MCA or PCA), relative to a regular agreement ($MRCA$), to describe the distribution of such choices by economic activity and size.

As shown in Figure 4 (left panel), the main economic activity classification reveals that firms operating in industries, such as Agriculture, Communication, Arts & Entertainment, Transports, Financial and other services are, *ceteris paribus*, more likely to opt for a$NRCA$, compared to most firms operating in manufacturing. Also larger firms are found more likely to resort to MCA or PCA relative to a regular collective agreement

Figure 4 Firms' attributes and likelihood of *NRCA* adoption (Industry and firm's size)
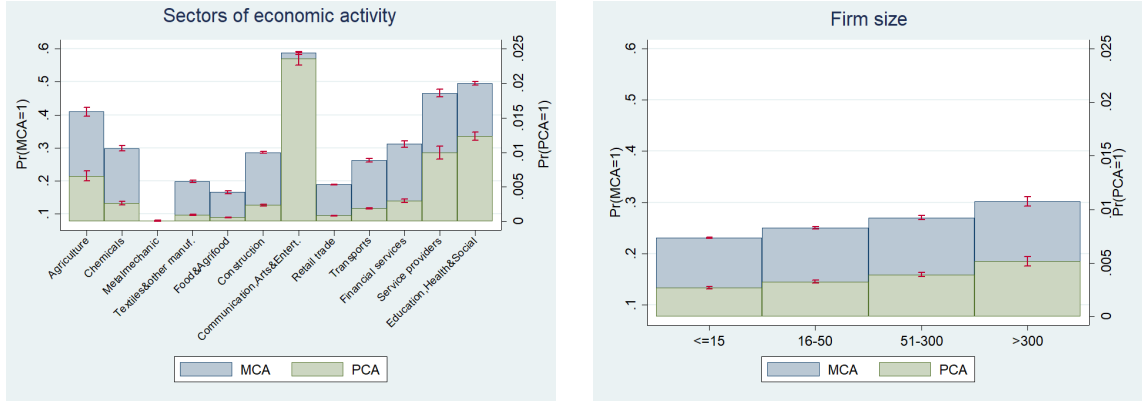
(Figure 4 – right panel). This evidence confirms findings from a large literature on the economic effects of employment protection legislation showing that larger firms, due to the higher firing costs imposed by the Italian legal set-up, might need additional margins of adjustment when faced with negative shocks (Scarpetta, 2014).[37]

Also, we ask whether firms which opted for a "pirate" agreement[38] also experienced, over the economic crisis, more wage flexibility and higher employment levels relative to other firms.[39] In other words, we compare and contrast the wage and employment patterns of firms with non-representative agreements with that of firms with a regular collective agreement over the 2005-2014 time period, setting 2007 as the baseline year for the start of the crisis. We estimate a fixed-effects model, on a panel of firms, interacting our variables of interest, that is the presence of *MCA* or *PCA* in the firm, with time dummies over the 2005-2014 time period. The specification also includes industry- and region-specific time trends to capture time-varying shocks.[40] This exercise requires some

---

[37]As discussed in Section 2.2, before 2015 firms with more than 15 employees were subject to the provisions of Art. 18 of the *Statuto dei lavoratori* which restricted the possibility of firms to adjust employment.

[38]We adopt a time-invariant partition of firms over the entire period and classify firms' choice of the type of collective agreement according to whether at least one employee has ever been covered by a *NRCA*, and alternatively firms whose workforce is covered by a *MRCA*.

[39]Notice that the information on firm's employment level is coded as a categorical variable with 29 unique values: the first 20 categories are 5-employees-ranges for firms with 1 to 100 workers, 9 categories follow for firms with 100 to 500 workers (50-employees-range) and firms with more than 500 workers are coded with value 29. To perform our exercise we recoded such measure into a continuous variable using the upper bound of each interval.

[40]The specification we estimate is the following,

$$Y_{jt} = \sum_{k \neq -m}^{q} \gamma_{t+k} Year_{t+k} + \sum_{k \neq -m}^{q} \beta_{j,t+k}(\text{NRCA}_j * Year_{t+k})$$
$$+ \sum_j \sum_t \delta_{jt}(S_j * Year_t) + \sum_j \sum_t \lambda_{jt}(R_j * Year_t) + \alpha_j + \epsilon_{jt}$$

where Y_{jt} represents log average wages or employment level in firm j in year t, NRCA_j is a vector of

caveats to be discussed in order to interpret the results. First, we use a time-invariant definition for the type of collective agreement associated to the firm over the entire period, thus effectively comparing firms with a MCA or PCA relative to other firms with a $MRCA$.[41] Second, since we estimate a fixed-effects model and our variables of interest – the type of collective agreement – are time-invariant, we can only identify the trends, as the level effect is absorbed by the firms' fixed-effects. In this way, we are able to control for firms' unobserved characteristics that might be correlated with the choice of the type of agreement, while we address any residual time-varying shocks saturating the specification with industry- and region-specific time trends. Notice that, conditional on the above specification, the allocation of firms to "pirate" agreements can be regarded as good as random. Third, we use an event-study specification which exploits the onset of the economic crisis as an exogenous and unanticipated (negative) demand shock which hit all firms (i.e. we set the time-event in 2007).[42] We fit separate regressions for wages and employment, and use the estimated coefficients of the relative-time indicator to describe the evolution over time of firm's average wages and employment levels, respectively, contrasting the experience of firms applying "pirate" (PCA) and "mismatch" agreements (MCA) with that of other firms which apply regular agreements.

The empirical evidence from the above exercise, even if we cannot interpret the results as causal, is useful to highlight the different labour market patterns of firms with and without "pirate" collective agreements. In Figure 5 we report the estimated coefficients (and their confidence intervals), for average wages (left panel) and employment levels (right panel), on both MCA and PCA dummies, relative to firms with a $MRCA$ (i.e. the red dotted line).

The evolution of average wages and employment levels shows a divergent pattern: firms with a "pirate" agreement (PCA), relative to firms with a regular collective agreement ($MRCA$), are characterised by a downward trend in wages from 2010 onwards (see the left panel in Figure 5), while the evolution of employment levels exhibits an upward trend, which becomes particularly steep during the final years of economic recovery (see the right panel in Figure 5). The patterns which characterise firms applying MCA are more similar to firms with a regular collective agreement, with a moderately positive trend in wages and employment levels, relative to firms with $MRCA$. Whilst some care should be used in interpreting the above results, the evidence reported suggests that some firms might have resorted to "pirate" agreements to gain additional flexibility in

---

binary variables – MCA or PCA – that take value 1 if the firm applies a non-representative agreement, 0 otherwise; δ_{jt} and λ_{jt} measure industry- and region-specific time trends, respectively; while α_j are firm fixed effects.

[41]Notice that since the number of firms applying a "pirate" agreement increased over time, by using a time-invariant classification we are effectively underestimating the effects for firms which applied such contracts only towards the end of the period.

[42]We test the validity of the common-trend assumption, for the pre-event years, across the different types of collective agreements.

Figure 5 Wages levels and employment - *MCA* and *PCA*

wage bargaining and lower wage levels. The positive effect on employment levels, relative to other firms, also indicates that these firms did better at preserving employment levels – i.e. either reducing employment losses during the crisis, or increasing employment in the recovery years. The trends associated with "mismatch" agreements suggest a different story, as these type of agreements might have been adopted by firms, outside their main economic activity, to gain discretion on other non-pecuniary provisions (such as working-time flexibility, shift-work and sick leave, occupational classification, etc.), with limited or no effects on wages and employment patterns.

While it may be tempting to interpret these findings as evidence of a labour demand schedule, with "pirate" agreements being the adjustment margin to which firms have resorted to preserve employment levels, we think that such interpretation can only be suggestive and that further research and a more robust identification strategy are needed to support this view.

6 Conclusions

We document the dramatic increase in the number of sector-level collective agreements, which occurred in Italy in recent years, with particular reference to those agreements signed by unknown organisations – i.e. the so-called "pirate" agreements. The diffusion of "pirate" agreements paved the way to a "race-to-the-bottom" in negotiated minimum wages and other collective bargaining provisions. This unregulated change in the structure of collective bargaining is the result of different factors, ranging from unions and employers' associations fragmentation, regulatory uncertainty about social partners' rep-

resentativeness, as well as firms deliberately opting out from the system of collective bargaining. These trends are shared by a number of other European countries in which opt-out clauses and a growing decentralisation of bargaining have eroded the relevance of sector-level agreements in the regulation of labour contracts.

In this paper, we use a matched employer-employee panel data, drawn from the INPS archives, to investigate the issue of collective agreement representativeness and estimate the labour market effects of the diffusion of "pirate" agreements. We find evidence of a significant dumping effect on wages associated with different types of non-representative collective agreements, relative to other firms with regular collective agreements. An average wage penalty of 15% is estimated for employees covered by a "pirate" agreement, half of which is accounted for by selection effects, that is low productivity individuals more likely to be employed in firms adopting "pirate" collective agreements. We show that firms with non-representative agreements are less likely to comply with the negotiated minimum wages set in collective agreements signed by the most representative social partners, suggesting that the dumping effects of "pirate" contracts goes through lower minimum wages and weaker labour standards. We also report significant differences by firm size and industry affiliation both in the diffusion of "pirate" agreements, as well as in the magnitude of the wage penalties: large firms in non-manufacturing industries are found more likely to apply a "pirate" agreement and show a larger wage penalty compared to small firms.

Finally, we run a counterfactual exercise exploiting the onset of the economic crisis to estimate the different labour market trends of firms with "pirate" agreements, relative to firms with regular collective agreements. We find that firms which apply "pirate" agreements are characterised by higher flexibility in wage levels and better employment performance relative to other firms. Although some care is needed in interpreting these results, taken at their face value they suggest that some firms resorted to "pirate" agreements to gain additional (downward) flexibility in wage bargaining and retained relatively better employment prospects over the crisis years.

A related argument for the debate is whether the un-coordinated evolution of the structure of collective bargaining which we have documented here, along with the diffusion of "pirate" collective agreements, is desirable to achieve a more efficient wage-employment trade-off compared to the current setting of national collective agreements. In other words, our findings raise the issue for the policymakers as to whether the wage flexibility necessary to increase the resilience of the Italian labour market to economic shocks has to be regulated and left with the responsibility of the most representative social parties, or should it be left unregulated to the market and to the dumping effects of "pirate" agreements, as it is the case now.

While a thorough discussion of the issues at stake is beyond the scope of the present paper, we believe that the patterns in collective bargaining and the implied labour market

outcomes discussed here can contribute to the debate concerning the future structure of industrial relations.

References

Ashenfelter, O. and Smith, R. (1979), 'Compliance with the minimum wage law', *Review of Economics and Statistics* **87**(3), 333–350.

Avouyi-Dovi, S., Fougère, D. and Gautier, E. (2013), 'Wage rigidity, collective bargaining, and the minimum wage: evidence from French agreement data', *Review of Economics and Statistics* **95**(4), 1337–1351.

Bassanini, A., Garnero, A., Marianna, P. and Martin, S. (2010), 'Institutional determinants of worker flows', *OECD Social, Employment and Migration Working Papers* (WP No.107).

Baumgarten, D. and Lehwald, S. (2019), 'Trade Exposure and the Decline in Collective Bargaining: Evidence from Germany', *CESifo Working Papers* (WP No.7754).

Boeri, T. (2014), 'Two-tier bargaining', *IZA Discussion Paper* (DP No.8358).

Boeri, T. (2015), 'Perverse effects of two-tier wage bargaining structures', *IZA World of Labor* . doi: 10.15185/izawol.101.

Boeri, T. and Burda, M. (2009), 'Preferences for collective versus individualised wage setting', *The Economic Journal* **119**(540), 1440–1463.

Brändle, T. and Goerke, L. (2018), 'The one constant: a causal effect of collective bargaining on employment growth? Evidence from German linked-employer-employee data', *Scottish Journal of Political Economy* **65**(5), 445–478.

Bryson, A. and Dale-Olsen, H. (2008), 'A tale of two countries: unions, closures and growth in Britain and Norway', *CEP Discussion Paper* (DP No.867).

Calmfors, L. and Driffill, J. (1988), 'Bargaining structure, corporatism and macroeconomic performance', *Economic policy* **3**(6), 13–61.

Card, D., Heining, J. and Kline, P. (2013), 'Workplace heterogeneity and the rise of West German wage inequality', *The Quarterly journal of economics* **128**(3), 967–1015.

Cardoso, A. R. and Portugal, P. (2005), 'Contractual wages and the wage cushion under different bargaining settings', *Journal of Labor Economics* **23**(4), 875–902.

D'Amuri, F. and Giorgiantonio, C. (2014), 'Diffusion and outlook of firm-level bargaining in Italy', *Questioni di Economia e Finanza - Occasional Papers* (No.21).

Devicienti, F., Fanfani, B. and Maida, A. (2018), 'Collective Bargaining and the Evolution of Wage Inequality in Italy', *British Journal of Industrial Relations* .

Díez-Catalán, L. and Villanueva, E. (2015), 'Contract staggering and unemployment during the great recession: evidence from Spain', *Banco de España working paper* (WP No.1431).

DiNardo, J. and Lee, D. S. (2004), 'Economic impacts of new unionization on private sector employers: 1984–2001', *The Quarterly Journal of Economics* **119**(4), 1383–1441.

Dustmann, C., Fitzenberger, B., Schönberg, U. and Spitz-Oener, A. (2014), 'From sick man of Europe to economic superstar: Germany's resurgent economy', *Journal of Economic Perspectives* **28**(1), 167–88.

Eurofound (2010), 'Derogation clauses on wages in sectoral collective agreements in seven European countries', *Publication Office of the European Union, Luxembourg* .

European Commission (1993), 'Communication concerning the Application of the Agreement on Social Policy', *COM* **93**, 600.

European Commission (2016), 'Country Report Italy', *Publication Office of the European Union, Luxembourg* . http://ec.europa.eu/info/sites/info/files/cr_italy_2016_en.pdf.

Freeman, R. and Medoff, J. (1984), 'What Do Unions Do', *N.Y. Basic Books* .

Garnero, A. (2018), 'The dog that barks doesn't bite: coverage and compliance of sectoral minimum wages in Italy', *IZA Journal of Labor Policy* **7**(1), 3.

Garnero, A. and Lucifora, C. (2019), 'Turning a blind eye? Compliance to minimum wages and employment', *CoBExt Working Paper* .

Gürtzgen, N. (2009), 'Rent-sharing and collective bargaining coverage: Evidence from linked employer–employee data', *Scandinavian Journal of Economics* **111**(2), 323–349.

Haucap, J., Pauly, U. and Wey, C. (2001), 'Collective wage setting when wages are generally binding: An antitrust perspective', *International Review of Law and Economics* **21**(3), 287–307.

Izquierdo, M., Jimeno, J. F., Kosma, T., Lamo, A., Millard, S., Rõõm, T. and Viviano, E. (2017), 'Labour market adjustment in Europe during the crisis: microeconomic evidence from the Wage Dynamics Network survey', *European Central Bank Occasional Paper Series* (OP No.192).

Jimeno, J. F. and Thomas, C. (2013), 'Collective bargaining, firm heterogeneity, and unemployment', *European Economic Review* **59**, 63–79.

Leonardi, S., Ambra, M. C. and Ciarini, A. (2017), Italian collective bargaining at a turning point, *in* S. Leonardi and R. Pedersini, eds, 'Multi-employer bargaining under pressure: decentralisation trends in five European countries', ETUI, Brussels.

Martins, P. (2014), '30,000 minimum wages: The economic effects of collective agreement extensions', *IZA Discussion Paper* **DP No.8540**.

Martins, P. S. (2009), 'Rent sharing before and after the wage bill', *Applied Economics* **41**(17), 2133–2151.

OECD (2018), 'The role of collective bargaining systems for good labour market performance', *OECD Employment Outlook* **Chapter 4**, 73–122.

Ronchi, M. and Di Mauro, F. (2017), 'Wage bargaining regimes and firms' adjustments to the Great Recession', *European Central Bank Working Paper Series* (WP No.2051).

Rusinek, M. and Rycx, F. (2013), 'Rent-Sharing under Different Bargaining Regimes: Evidence from Linked Employer–Employee Data', *British Journal of Industrial Relations* **51**(1), 28–58.

Scarpetta, S. (2014), 'Employment protection', *IZA World of Labor* . doi: 10.15185/izawol.12.

Traxler, F. (2004), 'Employer associations, institutions and economic change: a crossnational comparison', *Industrielle Beziehungen: Zeitschrift für Arbeit, Organisation und Management* **11**(1/2), 42–60.

Visser, J. (2013), Wage Bargaining Institutions–from crisis to crisis, Technical report, Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.

Visser, J. (2015), 'Institutional characteristics of trade unions, wage-setting, state intervention and social pacts (ICTWSS), an international database', *Amsterdam Institute for Advanced Labour Studies (AIAS)* .

7 Tables

Table 1 National collective agreements: *MRCA, MCA, PCA* by industry (2014)

Industry	MRCA	MCA	PCA
Agriculture	0.472	0.519	0.009
Chemicals	0.777	0.217	0.006
Metalwork	0.881	0.081	0.038
Textiles & other manuf.	0.777	0.214	0.009
Food & Agrifood	0.867	0.132	0.001
Construction	0.647	0.352	0.001
Communication, Art & Entert.	0.371	0.615	0.014
Retail trade	0.757	0.234	0.009
Transports	0.764	0.220	0.016
Financial services	0.888	0.110	0.001
Service providers	0.782	0.215	0.002
Education, Health & Social work	0.715	0.270	0.015
Total	0.752	0.235	0.013

Note: Figures reported are row percentages.

Table 2 Estimated earnings differentials: *NRCA*

	(OLS)		(Fixed-effect)	
NRCA	-0.0490***		-0.0393***	
	(0.0005)		(0.0006)	
MCA		-0.0462***		-0.0368***
		(0.0005)		(0.0006)
PCA		-0.155***		-0.0819***
		(0.0030)		(0.0021)
Worker FE			✓	✓
R^2	0.433	0.433	0.815	0.815
N	9,078,834	9,078,834	8,911,350	8,911,350

Robust standard errors in parentheses, clustered at the worker level. Significance: * p<.1, ** p<.05, *** p<.01. Each model includes the full set of controls for age (quadratic), regional dummies for place of work, occupation (white collar, blue-collar, apprentice), part-time, type of contract (open-ended, fixed-term and seasonal), firm's number of employees ($\leq 15, 16-50, 51-300, > 300$) and industrial sector (ATECO-2002 recoded into 10 categories according with CCNL sectors).

Table 3   Heterogeneity - by firm size and occupation

	Occupation		Firm size	
	Blue-collar	*White-collar*	*Up to 15*	*>15*
MCA	-0.0500***	-0.00492***	-0.0485***	-0.0214***
	(0.0008)	(0.0011)	(0.0011)	(0.0008)
PCA	-0.103***	-0.0232***	-0.0927***	-0.0706***
	(0.0026)	(0.0033)	(0.0070)	(0.0022)
Worker FE	✓	✓	✓	✓
R^2	0.713	0.878	0.748	0.855
N	5,266,604	3,545,575	3,452,551	5,269,753

Robust standard errors in parentheses, clustered at the worker level. Significance: * p<.1, ** p<.05, *** p<.01. Results are obtained using the full set of controls.

Table 4   Minimum wage compliance (Linear probability)

	Baseline		Firm size			
			Up to 15		*>15*	
NRCA	0.0314***		0.0276***		0.0269***	
	(0.000614)		(0.00124)		(0.000794)	
MCA		0.0285***		0.0267***		0.0222***
		(0.000625)		(0.00125)		(0.000815)
PCA		0.0803***		0.0765***		0.0737***
		(0.00232)		(0.00762)		(0.00248)
Worker FE	✓	✓	✓	✓	✓	✓
R^2	0.792	0.792	0.803	0.803	0.808	0.808
N	8,911,350	8,911,350	3,452,551	3,452,551	5,269,753	5,269,753

Robust standard errors in parentheses, clustered at the worker level. Significance: * p<.1, ** p<.05, *** p<.01. Results are obtained using the full set of controls.

8 Appendix

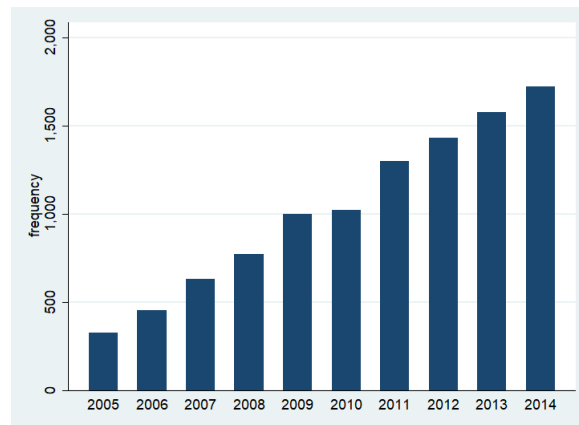*Figure A1*   Number of firms applying *pirate* agreements (2005-2014)

Table A1 Sample descriptive statistics

Variables	Total sample	Males	Females
Average			
Age	38.81	39.27	38.08
Median	(38)	(39)	(38)
Weekly earnings	453.85	477.94	415.55
Median	(400)	(416)	(375)
Share			
Female	0.398		
Part-time	0.222	0.107	0.404
Open-ended contract	0.825	0.840	0.802
Fixed-term contract	0.161	0.149	0.179
Seasonal contract	0.013	0.01	0.019
White-collar	0.358	0.264	0.508
Blue-collar	0.598	0.696	0.443
Apprentice	0.043	0.040	0.049
Firm size (1-15 employees)	0.401	0.390	0.418
16-50 employees	0.165	0.177	0.146
51-300 employees	0.191	0.199	0.178
300+ employees	0.243	0.234	0.258
Industry			
Agriculture	0.006	0.006	0.005
Chemicals	0.034	0.041	0.025
Metalwork	0.148	0.194	0.074
Textiles & other manuf.	0.066	0.057	0.079
Food & Agrifood	0.033	0.033	0.033
Construction	0.113	0.170	0.023
Communication,Arts & Entert.	0.047	0.045	0.051
Retail trade	0.381	0.298	0.514
Transports	0.057	0.076	0.027
Financial services	0.037	0.031	0.046
Service providers	0.024	0.030	0.014
Education,Health & Social work	0.054	0.019	0.109
Share of workers covered by PCA	0.016	0.017	0.015
Obs.	9,078,834	5,573,876	3,504,958

Table A2 National collective agreements by industry (Metalwork, Chemical and Transports): Selected *MRCA*, *MCA* and *PCA* (2014)

Collective agreement	Employers' Associations	Trade Unions	Workers %	Workers Cum.	Firms %	Firms Cum.
METALWORK						
Industries	CONFINDUSTRIA;FEDERMECCANICA; Assistal	Fiom-CGIL;Fim-CISL;Uilm-UIL	58.75	58.75	40.08	40.07
S.M.I.	UNIONMECCANICA CONFAPI	Fiom-CGIL;Fim-CISL;Uilm-UIL	15.45	74.20	20.43	60.50
Artisans	CNA;CONFARTIGIANATO; Casartigiani;CLAAI	Fiom-CGIL;Fim-CISL;Uilm-UIL	13.88	88.08	31.38	91.88
MCA			8.08	96.17	7.94	99.82
PCA			3.83	100.00	0.18	100.00
CHEMICALS						
CHEM/PHARMA Industries	FEDERCHIMICA;FARMINDUSTRIA	Filctem-CGIL;Femca- CISL;Uiltec-UIL	35.99	35.99	21.35	21.34
CHEM/PHARMA S.M.I.	UNIONCHIMICA CONFAPI	Filctem-CGIL;Femca-CISL;Uiltec-UIL	3.08	39.07	5.71	27.05
PLASTICS/RUBBER:Industries	CONFINDUSTRIA;FEDERAZIONE G&P; ASS.IT.PNEUMATICI	Filctem-CGIL;Femca-CISL;Uiltec-UIL	27.92	66.99	25.25	52.30
PLASTICS/RUBBER:S.M.I.	UNIONCHIMICA CONFAPI	Filctem-CGIL;Femca-CISL;Uiltec-UIL	6.08	73.07	9.44	61.74
CHEM&others: S.M.I.Coop,Artisans	FEDARCOM;CIFA	Fesica-CONFSAL;Fisals-CONFSAL; CONFSAL	2.72	75.8	7.47	69.22
ENERGY&OIL	CONFINDUSTRIA ENERGIA	Filctem-CGIL;Femca-CISL;Uiltec-UIL	1.93	77.73	1.00	70.22
MCA			21.69	99.41	29.60	99.82
PCA			0.59	100.00	0.18	100.00
TRANSPORTS						
TRANS&LOGISTICS	AITE;AITI;Assoespressi; Assologistica;Fedespedi; Trasportounito FIAP;FISI; CONFETRA;FEDIT;ANITA; FAI;Assotir;Federtraslochi; Federlogistica;FIAP;UNITAI; Conftrasporto;CNA-FITA; Confartigianato TRASPORTI; SNA-Casartigiani;CLAAI	Filt-CGIL;Fit-CISL;Uiltrasporti-UIL	46.47	46.47	54.71	54.69
TRANSPORTS: S.M.I., Artisans and Coop	Federimprenditori	FAMAR;CONFAMAR	2.07	48.54	3.74	58.43
PUBLIC TRANS. workers	ASSTRA;ANAV	Filt-CGIL;Fit-CISL;Uiltrasporti-UIL	15.45	63.99	4.62	63.05
CAR RENTAL	UNCI	FAST Confsal;FAST Noleggio Confsal	3.49	67.48	6.03	69.08
CABLEWAYS	ANEF	Filt-CGIL;Fit-CISL;Uiltrasporti-UIL; SAVT	1.05	68.54	1.15	70.23
AIR Transport	Assaereo;Assaeroporti; Assohandlers;Assocontrol;Assocatering	Filt-CGIL;Fit-CISL;Uiltrasporti-UIL UGL-Trasporti	6.23	74.77	2.58	72.83
PORTS: port workers	Assiterminal;Assologistica; Assoporti;FISE-Uniport	Filt-CGIL;Fit-CISL;Uiltrasporti-UIL	1.67	76.43	0.88	73.69
MCA		21.99	98.42		25.50	99.17
PCA			1.58	100.00	0.83	100.00

31

Table A3 Estimated wage gaps for NRCA: different sample and dependent variable

	Baseline		Log(daily wages)		Excluding metal industry	
NRCA	-0.0393*** (0.000596)		-0.0508*** (0.000567)		-0.0416*** (0.000662)	
MCA		-0.0368*** (0.000609)		-0.0515*** (0.000581)		-0.0397*** (0.000667)
PCA		-0.0819*** (0.00208)		-0.0389*** (0.00190)		-0.100*** (0.00278)
Worker FE	✓	✓	✓	✓	✓	✓
R^2	0.815	0.815	0.775	0.775	0.812	0.812
N	8,911,350	8,911,350	8,911,222	8,911,222	7,561,354	7,561,354

Robust standard errors in parentheses, clustered at the worker level. Significance: * p<.1, ** p<.05, *** p<.01. Results are obtained using the full set of controls.

Table A4 Estimated wage gaps for NRCA: job-match fixed effects and industry-level time trends

	Baseline		Industry-level time trends		Job match FE	
NRCA	-0.0393*** (0.0006)		-0.0394*** (0.0006)		-0.0102*** (0.0010)	
MCA		-0.0368*** (0.0006)		-0.0366*** (0.0006)		-0.00111 (0.0010)
PCA		-0.0819*** (0.0021)		-0.0870*** (0.0021)		-0.0516*** (0.0024)
Worker FE	✓	✓	✓	✓		
Industry-level time trends			✓	✓		
Job-match FE					✓	✓
R^2	0.815	0.815	0.815	0.81	0.891	0.891
N	8,911,350	8,911,350	8,911,350	8,911,350	7,958,305	7,958,305

Robust standard errors in parentheses, clustered at the worker (col. 1-2 and 5-6) and worker×firm (col. 3-4) level. Significance: * p<.1, ** p<.05, *** p<.01. Results are obtained using the full set of controls.

Table A5 Estimated wage gap for NRCA: alternative clustering of the std errors

	(1)		(2)		(3)	
NRCA	-0.0393***		-0.0393***		-0.0393***	
	(0.000596)		(0.00271)		(0.000526)	
MCA		-0.0368***		-0.0368***		-0.0368***
		(0.000609)		(0.00263)		(0.000535)
PCA		-0.0819***		-0.0819***		-0.0819***
		(0.00208)		(0.0105)		(0.00195)
Worker FE	✓	✓	✓	✓	✓	✓
Std err. clustering	Worker	Worker	Firm	Firm	Worker×Firm	Worker×Firm
R^2	0.815	0.815	0.815	0.815	0.815	0.815
N	8,911,350	8,911,350	8,911,350	8,911,350	8,911,350	8,911,350
N. clusters	1,307,407	1,307,407	990,490	990,490	2,678,488	2,678,488

Robust standard errors in parentheses, clustered at the worker (col.1), firm (col.2) and worker×firm level (col.3). Significance: * p<.1, ** p<.05, *** p<.01. Results are obtained using the full set of controls.