Wage compression within the firm: evidence from an indexation scheme*

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Abstract

We revisit the role of labour market institutions by showing how they affect the sharing of firm-specific rents between employers and employees. We look at an Italian wage indexation mechanism ("Scala Mobile") that compressed the distribution of wages imposing real wage increases at the bottom of the distribution. After developing a simplified version of a search model with intra-firm bargaining and on-the-job search, we document that skilled workers received lower wage adjustments when employed at firms with many unskilled workers and they tended to move towards more skill-intensive firms. Moreover, the system drove the least skill-intensive firms out of the market.

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Corresponding author: Michele Pellizzari, Institute of Economics and Econometrics, Geneva School of Economics and Management, University of Geneva, 40 Bd du Pont d'Arve, CH-1211, Geneva 4, Switzerland. Email: michele.pellizzari@unige.ch. *Acknowledgments:* We thank the editor and two anonymous referees for their valuable suggestions and comments. We would also like to thank David Card, Giacomo De Giorgi, Andrea Ichino, Thomas Lemieux, Marco Manacorda, Enrico Moretti and Giulio Zanella for useful comments and discussions. We are very grateful to Giuseppe Tattara and Marco Valentini for providing the data and for their insightful comments. Pietro Ichino helped us reconstructing the functioning of the Scala Mobile. We received useful suggestions from seminar participants at the Bank of Italy, Copenhagen Business School, Collegio Carlo Alberto, University of Essex, University of Geneva, the Tinbergen Institute, University of Zurich, University of Lugano, Universidad Carlos 3 Madrid, ILO, University of Bozen, University of Padua, University of Verona, the 2015 fRDB Workshop of Fellows and Affiliates, the 2015 Workshop on Policy Evaluation in Health Care and Labour Markets (Catholic University Milan) and the 2016 ESPE and EEA Conferences. All errors remain our sole responsibility. Financial support from the Swiss National Science Foundation is gratefully acknowledged (grant n. 100018 152770). The opinions expressed in this paper are solely our own and do not necessarily reflect the views of our institutions.

A recent trend in the vast literature on wage inequality emphasises the important role of firm heterogeneity in explaining wage differentials (Card, Heining and Kline, 2013; Gruetter and Lalive, 2009; Postel-Vinay and Robin, 2002). Contrary to the assumptions of the standard competitive labour market model, there is ample evidence that workplace characteristics are reflected into wages and that firm-specific rents may arise from a multiplicity of sources: search or bargaining frictions, technology, product markets (Cahuc, Marque and Wasmer, 2008; Card, Cardoso, Heining and Kline, 2016).

In this paper we contribute to this literature by showing evidence that also labour market institutions affect firm-specific rents and how they are shared with the employees. We study a peculiar wage indexation system that was implemented in Italy from the late 1970s to the early 1990s. This system - known as the *Scala Mobile* (henceforth SM) - mandated that the base salary of all dependent employees in the country had to be increased each quarter by the same nominal amount in absolute terms.[1] The resulting SM adjustments were identical for all workers in nominal absolute value but implied much larger real wage increases for workers at the bottom of the distribution rather than for workers at the top. As such, the system compressed the distribution of earnings from the bottom, similarly to a rising statutory minimum wage (Manacorda, 2004).

During the 1970s and 1980, Italy was characterised by a centralised wage setting mechanism, which to some extent is still in place today. Collective contracts were signed by trade unions and employers' associations at the industry-wide level. The contracts typically lasted two or three years and were binding for all employers (virtually all employers adopted a national contract or more than one) and all employees irrespective of union membership. National contracts set the minimum wages that apply to all workers within the same occupation and industry. Regional and firm-level agreements could only add wage components (typically related to indicators of profitability or productivity) on top of national minima. Up until 1993, the *Scala Mobile* fixed increases were also added quarterly to national minimum wages and were mandatory for all firms regardless of their financial situation.

We document that the SM system generated important wage differentials across and within firms. Firms with many low-paid workers were forced to grant each quarter large real wage increases to many of their employees, whereas firms with few low-paid workers barely had to worry about the indexation system. As per the within-firms

[1] Such nominal amount was computed as the product of the (quarterly) point change in the price index and a fixed parameter and was added to the monthly base salary. See section 3 for details.

effects, workers at the same percentile of the wage distribution were paid on average lower wage increases in firms with high SM burdens.[2] Concurrently, the SM system also influenced turnover and induced high-wage workers to move out of firms with heavy SM burdens to join employers with low SM burdens, who could offer larger wage increases beyond the compulsory SM adjustments. We also document that the SM forced the least skill-intensive firms out of the market while those firms which remained active compressed their internal wage structure, both by increasing wages below the firm-specific median and by decreasing those above the median.

These results show that institutions designed to help the low-paid may have important spillover effects throughout the entire distribution (DiNardo, Hallock and Pischke, 2000; Lee, 1999). This is in sharp contrast with most of the literature on labour market institutions, such as minimum wages and unions. This literature typically focuses on estimating the effects of institutions on low-wage earners, often under the assumption that high-wage earners would be unaffected (DiNardo, Fortin and Lemieux, 1996). Furthermore, the evidence presented here is consistent with the view that firm effects are due to quasi-rents that are shared between workers and employers (Arai, 2003; Bell and Reenen, 2011; Guertzgen, 2009; Guiso, Pistaferri and Schivardi, 2005; Martins and Yang, 2015; Reenen, 1996). For example Card, Devicienti and Maida (2014) recently highlighted the role of rents and hold up and their effects on investment. Using the same Italian data, we exploit the variation induced by the SM to look at the sources that may generate rents and analyse how the rent-sharing mechanism varies across workers at different points of the wage distribution. Although we are unable to look directly at rents (because data on firms' sales in the years of analysis are not available), we use the exogenous variation generated by an automatic indexation mechanism with fixed parameters and fixed (quarterly) frequency to identify the effects of wage-equalising institutions on wage inequality. In this way we tackle the identification issues that plague the literature on wage inequality as highlighted in Card *et al.* (2016).

To guide our empirical investigation we develop a simplified version of a search model with intra-firm bargaining and on-the-job search, building on the work of Stole and Zwiebel (1996) and Cahuc, Postel-Vinay and Robin (2006). In the model, the SM can be viewed as a policy affecting the size of rents and the relative bargaining power of skilled and unskilled workers in a tripartite negotiation game involving skilled workers, unskilled workers and employers.

[2]The firm-specific burden of the SM is measured - in our benchmark specification - with the share of employees who were given positive real wage increases by the system.

Obvious limitations of this study are the distant period of analysis and the peculiarity of the indexation system, which might limit external validity. Nevertheless, the analysis of the SM can still be informative about the effects of wage-equalising labour market institutions that currently exist in modern labour markets, such as minimum wages and certain forms of collective bargaining (Card, 1983). This is, in fact, the mechanism described in the simple theoretical model of Section 1, which in itself is quite general. One can actually use the model to link our analysis to more recent labour market phenomena, such as, for example, skill biased technical change (SBTC). In the terminology of the model, SBTC would induce a shift in the distribution of production technologies towards more skill intensive ones. Our theoretical framework predicts that such shift would reduce the scope for within-firm rent sharing across types of workers and thus lead to larger wage inequality, even for fixed labour market institutions. Interestingly, this is a predictions that conforms with the empirical evidence on the role of SBTC for wage inequality, suggesting that our analysis can contribute to understanding the dynamics of modern labour markets.

The paper is organised as follows. In Section 1 we develop the theoretical framework that we use to inform our empirical analysis. In Section 2 we describe the data and in Section 3 we present a brief history of the SM and its functioning. In Section 4 we discuss our empirical strategy and the related identification issues. Section 5 presents the results on the effects of the SM on the distribution of wages, within-firm wage compression, firm exit and workers turnover. Section 6 provides some robustness results. Section 7 concludes.

1 A simplified model of within-firm bargaining

In this section we present a simplified matching model that will guide our interpretation of the empirical evidence. The model features search and technological frictions: workers cannot freely change employers and firms cannot change their production technologies. These frictions generate rents that are shared via a bargaining process that departs from the common one-job/one-worker assumption and takes into account the complementarities of skilled and unskilled workers in the production process.

The types of frictions we consider here are the most natural source of rents for generating theoretical implications on our outcomes of interest, namely wages but also worker turnover and firm exit.[3]. A crucial element of our framework is that bar-

[3]There also exist other models of rent-sharing with different sources of rents, which would produce similar results but either on a subset of our outcomes of interest or requiring a more complicated model

gaining takes place within firms. With this assumption we depart from the traditional simpler framework without intra-firm bargaining, which usually assumes absence of complementarities and individual wage negotiations without consideration for the co-workers at the same firm. Within-firm bargaining is paramount for generating spillover effects across the distribution of wages which would otherwise only arise through general equilibrium effects, as is the case with the traditional framework that is normally implicitly used for the analysis of labour market institutions.[4]

In our theoretical framework we consider an economy with two types of workers - the skilled (H) and the unskilled (L) - and heterogeneous firms which produce using different combinations of labour. For tractability we assume the following production function:

$$y_\rho = (x_H + \rho x_L)\, min\left\{H, \frac{L}{\rho}\right\} \quad \text{with } \rho \geq 1 \tag{1}$$

where x_H and x_L are the productivities (or the contributions to output) of skilled and unskilled workers respectively and ρ is the parameter of firm heterogeneity. x_L is normalised to equal 1. Equation 1 defines a class of Leontief production functions that can be easily interpreted as team work. For example, a firm with $\rho = 1$ produces using teams composed of one skilled and one unskilled worker; therefore, if it employs one unskilled and two skilled workers, only one team is productive and one of the unskilled workers is not contributing to output. A firm with $\rho = 2$ produces with teams of one skilled worker and two unskilled. Hence, the parameter ρ can be interpreted as the inverse of skill intensity. One skilled worker is always needed to operate the team but there are many types of firms, producing with few or many unskilled workers per team. We assume that ρ is distributed according to a generic cdf $P(\cdot)$ over the support $[1, +\infty)$.[5]

The production process in equation 1 captures the essence of skill complementarities while at the same time maintaining individual productivities independent of one another (conditional on production taking place) and avoiding the complications due to the differences between marginal and infra-marginal workers which are unnecessary for our purposes (Cahuc *et al.*, 2008; Stole and Zwiebel, 1996).

(Card *et al.*, 2014; Kline and Moretti, 2013; Moretti, 2013)

[4]For example, the classical papers by DiNardo *et al.* (1996); Lee (1999); Neumark, Schweitzer and Wascher (2004) document some spillover effects of minimum wage increases around the right neighbourhood of the minimum. This finding is rationalised as a general equilibrium effect: the increase in the minimum wage or a statutory real pay rise for low wages (as in the SM) leads to lower demand of unskilled workers and potentially higher demand for slightly more skilled workers who can carry out similar tasks more efficiently.

[5]Notice that ρ does not necessarily define firm size, as each firm can operate multiple teams. We assume that all the teams of the same firm must adopt the same technology.

For simplicity we assume a finite horizon and the following timing of the model. At time zero all workers are exogenously allocated to jobs and there is no unemployment nor inactivity. This is admittedly a very restrictive assumption but it is coherent with our empirical analysis, which conditions on individuals being employed in 1976. Given such an allocation, wages are negotiated and paid out and production takes place. At time 1 workers have the opportunity to meet a new potential employer but, due to standard search frictions, such opportunity arises only with some probability λ smaller than 1. Other frictions prevent firms from changing their production technologies. Next, wages are negotiated (or renegotiated) and job-to-job moves can take place. Finally, wages are paid out and production takes place.

We assume that the initial (real) wages of the unskilled workers are set exogenously at a fixed level $\overline{w}$ for all firms. We assume that such pay level changes over time only in relation to changes in the minimum wage or new rounds of unions negotiations or, as it is relevant for our application, according to a statutory indexation system like the SM.[6] With no variation in wages across firms, there is no reason for unskilled workers to change employer and we will assume that they never do.[7]

The wages of skilled workers are negotiated according to a strategic bargaining process similar to that in Cahuc *et al.* (2006). Let us first consider workers who do not have the opportunity to change employer, namely all the workers at time 0 and a fraction $1-\lambda$ at time 1. Their wages are set by maximizing the weighted product of the partners' surpluses:

$$w_0(\rho) = \max_w (w-u)^{\gamma} \left(y_\rho - \rho\overline{w} - w\right)^{1-\gamma} \tag{2}$$

where $w_0(\rho)$ is the wage paid to a H-worker at a ρ-firm, γ is the bargaining power of the worker and u is the value of unemployment. The surplus of the firm is derived under the assumption that if the negotiation fails and the skilled worker is not hired the entire team is dismissed at no cost and that the value of vacant jobs is zero.[8] For

[6] We could also allow the wages of the unskilled to vary across firms and only impose a common increase to all of them. However, the resulting model would be substantially more complicated because we would have to determine endogenously both the wages of the unskilled (which would be determined simultaneously to those of the skilled) and their turnover decisions. These additional complications would not improve the ability of the model to describe our empirical findings and we therefore prefer to impose the simplifying assumption that unskilled wages are fixed exogenously.

[7] Unskilled workers may have an incentive to move from less- to more skill-intensive firms if they anticipate that the first have a higher probability of exiting the market but we abstract from this effect.

[8] An alternative way to state the same assumption is that unskilled workers are only hired conditional on successful bargaining with the skilled worker. When paying the exogenous wage rate $\overline{w}$, unskilled workers can be hired (and dismissed) frictionlessly.

simplicity we normalise the value of unemployment to zero ($u = 0$) and we derive the following solution to the maximisation problem in equation 2:

$$w_0(\rho) = \gamma[x_H - \rho(\overline{w} - 1)] \tag{3}$$

Equation 3 clearly shows the nature of the spillover effect between the wages of the unskilled and the skilled workers. The overall surplus to be shared between skilled workers and their employers is $(y_\rho - \rho\overline{w})$ and it is reduced when the salary of the unskilled increases, for example because of a mandatory SM adjustment.[9] Hence, a higher $\overline{w}$ translates into lower salaries for the skilled. The derivative of $w_0(\rho)$ with respect to $\overline{w}$ is $-\gamma\rho$ indicating that this effect is stronger in firms employing many unskilled workers (relative to the skilled).

If $\overline{w}$ is larger than 1, which corresponds to the productivity of the unskilled (x_L), then $w_0(\rho)$ is decreasing in ρ. In other words, if the employer is forced to pay the unskilled above their productivity, then H-workers are better paid in more skill-intensive firms (i.e. with lower ρ). Under this assumption, H-workers will never want to move to less skill-intensive employers (i.e with higher ρ). However, they would like to move to more skill-intensive firms (i.e. with lower ρ) if they have the opportunity to do so.

When a skilled worker meets a new potential employer at time 1 (with probability λ), the type of the poaching firm, denoted by ρ', is randomly drawn from the distribution $P(\cdot)$. The new job opportunity triggers a three-player bargaining between the worker, the incumbent and the poaching employer. The mechanism is identical to the one described in Cahuc *et al.* (2006), although it is implemented in our much simplified framework.[10] All parties have perfect information about their types, wage offers are observable and verifiable and there are no renegotiation costs. The sequence of the bargaining process is the following: once the worker makes contact with a new potential firm, the incumbent and the poaching employer simultaneously make a wage offer; then the worker chooses the best offer; and, finally, she goes back to the employer whose offer was refused and renegotiates using the new wage proposal as an outside option.

The outcome of this game depends on the types of the employers. If the poaching firm is more skill-intensive than the incumbent (i.e. $\rho' < \rho$), then the latter is drawn to

[9] An alternative interpretation would be that changes in $\overline{w}$ modify the relative bargaining power of skilled and unskilled workers. However, such an interpretation is not very evident in this version of the model where the wages of the unskilled are fully exogenous and not negotiated endogenously.

[10] In our setting the non-renegotiation wage of equation 3 plays the same role as the wage negotiated by the unemployed workers in Cahuc *et al.* (2006).

offer the entire surplus to the worker, namely $[x_h - \rho(\overline{w} - 1)]$, in an attempt to retain her.[11] Then, the worker negotiates a new wage with the poaching employer using this as an outside option. Eventually, the worker will move to the new more skill-intensive firm with the following wage:

$$w(\rho, \rho') = [x_h - \rho(\overline{w} - 1)] + \gamma(\rho - \rho')(\overline{w} - 1) \quad \text{with } \rho' < \rho \tag{4}$$

where we indicate with $w(\rho, \rho')$ the wage paid by a firm of type ρ' to a skilled worker who had the alternative option of working for a ρ-firm. Such a wage is equal to the full surplus of the alternative match plus a fraction γ of the difference between the surpluses of the two potential matches.

When the new potential employer is less skill-intensive that the incumbent, i.e. $\rho \leq \rho'$, the worker might still have an interest in triggering the renegotiation game because it may allow her to command a higher wage from the incumbent employer. Now it is the poaching firm which is drawn to offer the entire surplus to the worker, who then uses it as an outside option in the negotiation with the current employer to obtain the following wage:

$$w(\rho', \rho) = \left[x_h - \rho'(\overline{w} - 1)\right] + \gamma(\rho' - \rho)(\overline{w} - 1) \quad \text{with } \rho \leq \rho' \tag{5}$$

Obviously, the worker will engage in the negotiation game only if $w(\rho', \rho)$ is higher than $w_0(\rho)$ and this is guaranteed when $\rho' < \frac{X_H}{\overline{w}-1}$. This is exactly the same condition required for the total surplus of the match without renegotiation to be positive (see equation 2). In other words, production technologies with ρ larger than $\frac{X_H}{\overline{w}-1}$ are not profitable in equilibrium.[12]

To sum up, this simple model generates the following empirical implications that we will test in the following sections.

- As the wage of unskilled workers increases, the wages of the skilled decrease and such spillover effect is stronger in less skill-intensive firms (i.e. firms with higher ρ). We investigate this implication empirically in Section 5.1.

- Skilled workers move from less to more skill-intensive firms with probability $\lambda P(\rho)$. Hence, they are more likely to move when they are employed at less

[11] We assume that when the worker is indifferent between the new and the incumbent employer she remains in the current job.

[12] For simplicity we have set the value of unemployment to zero. As a consequence workers always engage in the renegotiation process because their outside option will always increase regardless of the type of the poaching firm.

skill-intensive firms. We explore this implication empirically in Section 5.2.

- As the wage of unskilled workers increases the less skill-intensive firms exit the market. In fact, we have shown that only firms with $\rho \leq \frac{X_H}{\overline{w}-1}$ experienced non-negative surpluses. As $\overline{w}$ increases, this threshold decreases and firms with unprofitable technologies leave the market. Section 5.2 also explores this implication.

- The model further predicts that the spillover effect is stronger for the job stayers. To see this, consider two skilled workers - A and B - who are both employed at the same incumbent firm of type ρ. At some point, they both find an alternative employer. However, worker A is lucky and meets a more skill-intensive firm of type $\rho' < \rho$ whereas worker B finds a less skill-intensive firm of type $\rho'' > \rho$. Therefore, worker A leaves the original employer and joins the new firm at the wage $w(\rho, \rho')$ while worker B remains in her current job but renegotiates the wage to $w(\rho'', \rho)$. Then, it is easy to show that the derivative with respect to $\overline{w}$ of $w(\rho'', \rho)$, the wage of the job stayer, is more negative than the same derivative of $w(\rho, \rho')$, the wage of the job mover.[13] We test this implication empirically also in Section 5.1.

It is perhaps worth emphasising that the implications derive crucially from the existence of intra-firm bargaining and production complementarities. Any models without these features, in fact, would fail to reproduce at least three of these predictions. First, changes in labour market institutions affecting low wages should leave the distribution of wage differentials across firms unchanged. In other words, similarly skilled workers should earn the same wage in all firms or, at a minimum, firm-specific differentials should be unaffected by changes in the institution. Second, changes in such institutions should not affect worker turnover, especially for the most skilled workers. Third, changes in such institutions should not change the direction of worker turnover, namely the likelihood of moving towards more or less skill-intensive employers.

Notice also that the model describes two types of wage bargaining processes, both of which are very common in the labour markets of many countries, both today and in the past. The first applies to unskilled workers and is crucially not firm specific: whatever wage adjustments are negotiated for $\overline{w}$, they are applied to all unskilled workers regardless of the type of their employing firm. The real world equivalent of this

[13] Note that $\frac{\partial w(\rho,\rho')}{\partial \overline{w}} = -(1-\gamma)\rho - \gamma\rho' < 0$ and $\frac{\partial w(\rho'',\rho)}{\partial \overline{w}} = -(1-\gamma)\rho'' - \gamma\rho < 0$. Given that $\rho' < \rho < \rho''$, it follows that $\frac{\partial w(\rho'',\rho)}{\partial \overline{w}} < \frac{\partial w(\rho,\rho')}{\partial \overline{w}}$.

is the standard form of collective bargaining, normally taking place at the national level and including legislative interventions, such as minimum wages and indexation mechanisms. The second important form of bargaining is between the skilled workers and their employers, possibly including a poaching employer as a third party. This could be reflecting individual level negotiations between workers and employers but also other common forms of collective bargaining, such as local unions negotiating separately by skill levels or sectoral agreements differentiating between skilled and unskilled workers.

Finally, we also want to emphasise that the model in this section is quite general and can be useful to assess the external validity of our empirical analysis, that is admittedly based on a rather distant period of time and a somewhat obsolete institution (the Scala Mobile). For example, one can relate our analysis to the more recent emergence of skill biased technical change (SBTC), which in the context of the model would be captured by a shift in the distribution of ρ towards more skill intensive technologies (i.e. lower ρs across firms). The model predicts that such a shift would reduce the extent of redistribution between skilled and unskilled workers within the firm leading to larger wage inequality. SBTC is commonly modelled as a phenomenon that affects the relative productivity of different skill groups (Card and DiNardo, 2002) and increases the relative demand of skilled labour. Our model highlights the implications of economy-wide STBC on within-firm wage inequality. We take this example as an indication that our analysis can be very useful to understand the dynamics of modern labour markets beyond our specific empirical application.

2 The INPS Social Security Archives of Veneto

The dataset used for this study is derived from the archives of the Italian Social Security Administration (INPS).[14] It contains information on all individuals who have worked as dependent employees for at least one day at any private firm located in the region of Veneto between 1975 and 2001.[15] Once this condition is met, the en-

[14]The dataset was developed by the Economics Department in Università Ca' Foscari Venezia under the supervision of Giuseppe Tattara. The same data have already been used in Card *et al.* (2014); Cingano and Rosolia (2012); Leonardi and Pica (2013).

[15]Veneto is one of the largest regions of Italy with around 5 million residents. It is located in the north-east of the country and it borders with Austria on the north and Croatia (and the Adriatic sea) on the east. It used to be one of the poorest regions of the country, with very high emigration rates (mostly to Northern Europe and South America). Starting in the 1960s, it experienced very sustained economic growth and it is now one of the richest areas of Italy, comparable to the north-west (Milan, Turin, Genoa), which has traditionally been the wealthiest part of the country.

tire work history of the employee is reconstructed, importing information also from employment spells outside the region.

The unit of observation is the individual employment relationship and the archive includes information about start and end dates, the total compensation paid in each year, the number of working weeks in the year, the type of contract (part-time vs. full time, temporary vs. permanent), the industrial sector of activity, the geographical location of the establishment, gender, age and citizenship of the worker. Both workers and establishments are individually (but anonymously) identifiable and can be followed over time. For firms we observe the date of founding (censored at 1974) and, if they ceased their activities within the period of observation, the date of closure.

The main advantage of this dataset for the purpose of our analysis is the possibility to observe all the workers employed in any sampled firm, thus allowing us to look at within-firm inequalities. Two important limitations of this dataset are still worth mentioning. First, there is no information on workers' education. Second, once a worker disappears from the dataset we cannot say whether she was unemployed, inactive or employed in a sector that is not covered by the data, namely the public sector and self-employment. We do observe, however, if she returns to private dependent employment.

As a consequence of the nature of our dataset, attrition of both firms and workers might be a problem. We address it in our analysis by investigating changes in wages both at the individual and at the firm level and by showing that our main findings are robust to varying the samples used in both specifications (see Section 6.1).[16]

The original data cover a long period of time (from 1975 to 2001) but we focus on the period when the SM system was strongest, namely between 1976 - the year before the SM was first introduced - and 1982 - the year before its first major revision. In Section 6.2 we use information about other time periods for robustness.

When selecting our working sample we drop apprentices and managers, who were not subject to the SM system, and we trim wages at the top and bottom 2%. When we look at individual wage changes we further drop older workers who retire at some point over the period and those experiencing a spell of non-employment; we keep only workers who held at least one full-time job (in Veneto) in both 1976 and 1982. For those holding more than one job per year we only consider the longest spell and we annualised earnings for job spells lasting less than the full calendar year. It is important to notice that all the variables that are defined at the firm level, such as firm size or the

[16]In Table 8 we also look directly at the effect of the SM on the individual probability of exiting private employment and leaving the sample.

indicators of within-firm wage dispersion, are always computed before selecting the sample, i.e., using all the original observations.

Throughout the analysis we use several different sub-samples of the data and Table 1 compares each of them (columns 2 to 8) with the original universe of observations in Veneto in our baseline year 1976 (column 1). The top and bottom panels of the table show the descriptive statistics for the workers and the firms, respectively. The differences across the samples reflect the constraints in the definitions of the variables of interest, which are normally computed as differences between the baseline and the final period. For example, sample 2 is the one we use for the main analysis of wage changes, which require individual wage observations in both 1976 and 1982. Sample 3 is used for the analysis of changes in wage dispersion within firms, therefore it is limited to firms (and their employees) that are observed operating both in the baseline and the final year.

Overall, our least selective sub-sample (column 2) covers about 72% of the original universe of workers and about half of the total number of firms. Other empirical exercises are conducted on smaller samples, but overall all our samples reflect the most salient features of the Italian labour market of the 1970s. Employees were young (average age was around 32 years), mostly male (only around 30% were women) and blue collars (on average only around 13% of workers in the samples were white collars). Compared to the universe, the workers in our samples were better paid, with an average gross annual wage in 1976 above 16,200 Euros at 2014 prices. This included the worker's base salary and additional monetary payments for extra-hours, pay-for-performance, sickness and maternity benefits. In kind benefits are excluded. Average wages were higher for males than for females (around 17,700 Euros for males and slightly less than 15,000 for women) and for white collars than blue collars (almost 20,000 Euros against 16,500 Euros).

The bottom panel of Table 1 presents descriptive statistics for the firm sample. Firm size is larger than in the original population. This difference is due to the many workers in our samples who are continuously employed throughout the period of observation and who are more likely to be employed in larger establishments. Average firm size is around 9 (full-time equivalent) employees but the distribution is very skewed, with a few very large firms and a large number of small and very small ones. The average number of employees is above 21 workers and the median is 5. Only about 10% of firms in our selected sample have more that 15 employees, an important threshold in the Italian system as it determines the applicability of more stringent employment protection regulations.

Table 1: *Descriptive Statistics*

	Universe	Sample 1[a]	Sample 2[b]	Sample 3[c]	Sample 4[d]	Sample 5[e]	Sample 6[f]	Sample 7[g]
Worker-level variables								
Female	0.318	0.312	0.271	0.302	0.273	0.292	0.280	0.296
Age	32.573	32.639	32.366	32.619	32.461	33.414	31.599	32.936
	(12.668)	(12.093)	(10.405)	(12.146)	(10.383)	(10.359)	(10.829)	(10.763)
White collar	0.198	0.137	0.132	0.139	0.134	0.135	0.139	0.148
Job mover[h]	0.418	0.599	0.347	0.506	0.236	–	0.359	–
Wage in 1976[i]	13,214	16,299	16,875	16,792	17,048	17,392	16,915	17,806
	(45,846)	(7,387)	(4,752)	(7,526)	(4,768)	(4,858)	(7,074)	(7,319)
Number of workers	1,103,231	791,720	423,614	629,571	367,054	276,665	493,947	316,760
Firm-level variables								
Number of full-time employees	5.795	9.368	12.332	15.582	14.352	16.197	17.116	18.175
	(50.317)	(61.208)	(71.293)	(83.850)	(80.465)	(86.582)	(88.298)	(91.582)
More than 15 employees	0.053	0.096	0.131	0.168	0.154	0.178	0.186	0.200
	(0.224)	(0.295)	(0.337)	(0.374)	(0.361)	(0.382)	(0.389)	(0.400)
Share of white collars	0.169	0.144	0.138	0.136	0.146	0.149	0.138	0.140
	(0.375)	(0.287)	(0.269)	(0.251)	(0.272)	(0.272)	(0.248)	(0.248)
Number of firms	147,719	67,733	49,566	33,134	36,092	30,868	29,788	27,619

[a] Workers employed in any firm in 1976 and their employers. This is the sample used in Table 9.
[b] Workers employed both in 1976 and 1982 and their employers. This is the sample used in Table 4 and 6.
[c] Firms active both in 1976 and 1982 and their employees. This is the sample used in Table 5.
[d] Workers employed both in 1976 and 1982 in firms active both in 1976 and in 1982. This is the sample used in Table 11, column 2.
[e] Workers employed both in 1976 and 1982 in the same firms. This is the sample used in Table 11, column 3.
[f] Firms active both in 1976 and 1982 and their employees employed both in 1976 and 1986. This is the sample used in Table 12, Panel B.
[g] Firms active both in 1976 and 1982 and their employees employed in the same firms both in 1976 and 1986. This is the sample used in Table 12, Panel C.
[h] Job movers are workers who changed employer(s) throughout the period 1977-1982.
[i] Wages are reported in Euros at 2014 prices.
The table reports means and standard deviations (in parentheses). All values calculated in the year 1976.

3 The *Scala Mobile* and collective bargaining in Italy

Wage indexation mechanisms started to be adopted in Italy already after World War II, with large differences across sectors, geographical areas, qualifications and even gender. There was, in fact, no national legislation on the issue and the entire matter was delegated to bilateral negotiations between unions and employers. In 1977 a national law imposed the same indexation system to all dependent employees, the so-called *Scala Mobile* (SM).[17]

The SM mandated that each quarter the wages of all dependent employees in the country increased by the same nominal absolute amount computed as a the product of the point change in the price index and a fixed parameter, named the *contingenza* point.[18] Since the absolute SM adjustment was identical for all the workers, it obviously implied a much larger percentage change for workers earning low wages than for those earning high wages. Hence, the system had a powerful equalising effect, especially given the exceptionally high inflation rates experienced by the country during this period (for example, 21.2% in 1980). In fact, the SM was responsible for much of the increase in price levels, as firms transferred part of the mandated wage rises into higher prices.

The system was reformed a first time in 1983. The base period of the price index was updated and a new *contingenza* point was set, substantially reducing the generosity of the system (Erikson and Ichino, 1995). In the following years the SM became the target of fierce opposition, especially from skilled workers who perceived its strong equalizing effect as unfair.[19] The indexation mechanism was further modified in 1986 when the fixed *contingenza* point was abandoned and wage adjustments were made almost entirely proportional to inflation. Specifically, the new SM system set percentage wage rises equal to inflation up to a (sector- and occupation-specific) contractual minimum and equal to one-fourth of inflation for the part exceeding the minimum. Besides, SM adjustments started to be paid out every 6 rather than 3 months (in April and October). Eventually, the entire system of wage bargaining was reformed in 1992 and the SM was abandoned: the last automatic wage increase was paid in October 1991.

Table 2 provides the exact details of the functioning of the indexation mechanism

[17] The Italian term *Scala Mobile* means escalator and is evocative of the automatic wage adjustments implied by the indexation mechanism.

[18] The only exceptions were managers, who always maintained their pre-1977 scheme, and employees in the public sector, for whom the common system was introduced a little later, in July 1978.

[19] Frustration among white collars culminated in the famous *"march of the forty thousand"*, one of the few examples of mass strikes by white collars in Italy (Baldissera, 1988; Giglio, 1981).

during its entire existence, from January 1977 to October 1991. In the first period (1977-1985) SM adjustments were paid at quarterly frequency, in January, April, July and October. For each quarter between April 1977 (the first adjustment) and October 1982 (the last adjustment before the 1983 reform), the table reports the level and the point change of the price index, the *contingenza* point and the actual mandated SM adjustment. This is computed as the product of column 2 and column 3 in the table, namely as the product of the (rounded) point change in the price index and the *contingenza* point. For example, in April 1977 the price index was 149 and it had increased by 6 points (rounded) since the previous quarter. Then, all private dependent employees in the country had their nominal wages risen by $6 \times 2,389 = 14,334$ Liras. The same procedure was replicated at each quarter until January 1983 when payments became biannual and both the price index and the *contingenza* point were revised. Finally, for the third period (1986-1991) the table reports the percentage change in the price index and, as an example, the contractual base wage of metal workers (*metalmeccanici*). SM adjustments were, then, divided into two parts; a part that increased the base wage proportionally to inflation (this is reported in the last column of Table 2, Panel C) and a part that increased the difference between the actual and the base wage by one fourth of inflation (this additional adjustment is not reported in the table as it depended on the actual individual wage).

In summary, the equalising power of the SM was strongest between 1977 and 1982, much milder between 1983 and 1985, and it essentially disappeared after 1986. Disregarding any possible equilibrium response, the mere automatic application of the first version of the SM for one year to the distribution of wages observed in 1976, the last year before the introduction of the system, would have reduced the standard deviation of real wages by 16 percentage points. After the 1983 reform, the same hypothetical exercise would result in a reduction of around 11 percentage points.[20]

[20]Performing the same calculations for the period after 1986 is more complicated because it requires knowledge of the entire set of contractual minimum wages, which are not available in our data and are very difficult to reconstruct. Card *et al.* (2014) were able to reconstruct these minima but only for the period after 1995 and only for some industries.

Table 2: *The Functioning of the Scala Mobile*

Year	Month	P_t^*	ΔP_t	*contingenza* point	SM adjustment
		[1]	[2]	[3]	[2]×[3]
Panel A: First period (1977-1982)					
1977	1	143	9	2,389	0
1977	4	149	6	2,389	14,334
1977	7	154	5	2,389	11,945
1977	10	158	4	2,389	9,556
1978	1	162	4	2,389	9,556
1978	4	167	5	2,389	11,945
1978	7	173	6	2,389	14,334
1978	10	178	5	2,389	11,945
1979	1	184	6	2,389	14,334
1979	4	192	8	2,389	19,112
1979	7	198	6	2,389	14,334
1979	10	206	8	2,389	19,112
1980	1	214	8	2,389	19,112
1980	4	226	12	2,389	28,668
1980	7	234	8	2,389	19,112
1980	10	244	10	2,389	23,890
1981	1	255	11	2,389	26,279
1981	4	269	14	2,389	33,446
1981	7	279	10	2,389	23,890
1981	10	288	9	2,389	21,501
1982	1	297	9	2,389	21,501
1982	4	309	12	2,389	28,668
1982	7	322	13	2,389	31,057
1982	10	335	13	2,389	31,057
Panel B: Second period (1983-1985)					
1983	1	104	4	6,800	27,200
1983	4	107	3	6,800	20,400
1983	7	110	3	6,800	20,400
1983	10	112	2	6,800	13,600
1984[†]	1	117	2	6,800	13,600
1984[†]	4	120	2	6,800	13,600
1984	7	123	3	6,800	20,400
1984	10	124	1	6,800	6,800
1985	1	127	3	6,800	20,400
1985	4	131	4	6,800	27,200
1985	7	133	2	6,800	13,600
1985	10	135	2	6,800	13,600

Continued on next page

Continued from previous page

Panel C: Third period (1986-1991)

year	month	P_t^*	$\%\Delta P_t$	Base $w^\ddagger$	Fixed full increase
		[1]	[2]	[3]	[2]×[3]
1986	4	138	2.72	580,000	15,776
1986	10	142	2.90	595,776	17,271
1987	4	145	2.61	613,047	16,015
1987	10	149	2.59	629,062	16,275
1988	4	153	2.64	645,337	17,011
1988	10	157	2.63	662,348	17,444
1989	4	162	3.43	679,792	23,287
1989	10	167	3.00	703,080	21,123
1990	4	173	3.68	724,203	26,664
1990	10	179	3.35	750,866	25,149
1991	4	187	4.34	776,015	33,676
1991	10	194	3.51	809,691	28,438

*The SM used a special price index purposely constructed by Italian National Statistical Institute (*indice dei prezzi al consumo per le famiglie di operai e impiegati*).
† Occasional caps to wage increases were adopted.
‡ For the manufacturing sector.
All amounts are in current Italian Liras.

3.1 The effect of *Scala Mobile* on the wage distribution

It is perhaps useful at this point to make a specific example to further clarify the role of the SM for workers at different points of the distribution of wages. Consider April 1977 when the SM mandated a wage adjustment of 14,334 Liras (see Table 2). The 6-point increase of the price index between January and April 1977 amounts to a percentage change of approximately 4%.[21] The SM adjustment of 14,334 Liras corresponds to a percentage increase of 4% (i.e. exactly in line with inflation) for a monthly wage of around 360,000 Liras (approximately 1,380 Euros at 2014 prices), corresponding to approximately the 17th percentile of the distribution. Therefore, the SM adjustment implied a real wage increase for anyone earning less than this amount and a real wage cut for anyone earning more. For example for a skilled person earning a monthly salary of 560,000 Liras in 1977 (around the 90th percentile of the distribution) the 14,339 Liras corresponded to a real wage cut of about 1.3% in a quarter. On the other end, for someone earning 235,000 Liras per month (around the 10th percentile of the distribution) the SM adjustment entailed a real rise of about 2%

[21] Notice that this is a quarterly increase. Yearly inflation was 18.1% in 1977.

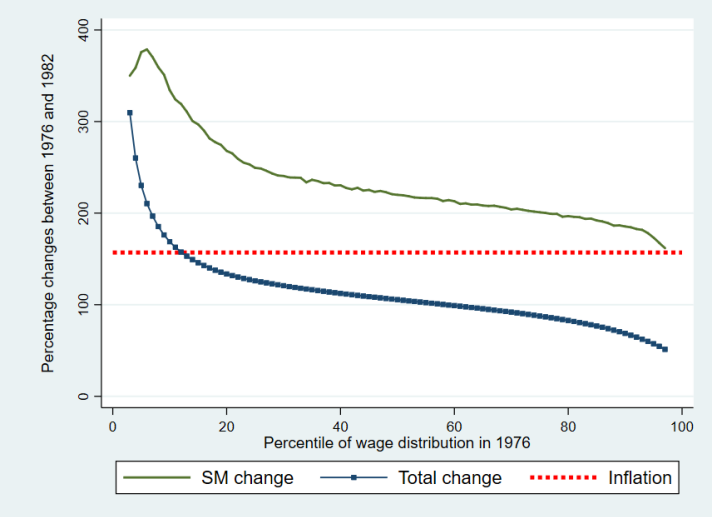

Figure 1: *Wage Changes in the Period 1976-1982*

in a quarter.

The main results of our analysis are produced with data on the first period of application of the SM, namely the years between 1976 and 1982, the period with the strongest equalising power of the system. We use data for the period immediately before the introduction of the SM, 1975-1976, and the following periods, 1982-1985 and 1985-1992, for robustness in Section 6.2.

The total cumulative SM wage adjustment mandated by the system over the years 1977-1982 can be simply represented as $(s \times \Delta P)$, where s is the the fixed nominal *contingenza* point and ΔP is the point difference in the price index.[22] Such nominal adjustment is the same for all workers. However, dividing through by the individual baseline wage in 1976 yields percentage wage changes that are larger for those with lower initial wages: $\frac{s\Delta P}{W_{i(76)}}$. In particular, for some workers the SM mandated wage changes larger than the cumulative inflation rate $\left(\frac{\Delta P}{P_{(76)}}\right)$, which totaled 157% between 1976 and 1982. More precisely, the SM mandated wage increases above inflation for all workers at or below the 14th percentile of the 1976 distribution of wages.

This is evident from Figure 1, which plots for each percentile of the initial distribution the average SM percentage adjustment $\frac{s\Delta P}{W_{i(76)}}$ and the average percentage total wage change, that is the percentage difference between the wages in 1976 and 1982.

[22]The computation of the SM change over the entire period is slightly more complicated than the simple product $s\Delta P$ because one needs to consider the sum of all the *contingenza point* adjustments which were computed quarterly. However, the nominal SM adjustment remains the same for all workers regardless of whether it is computed quarterly, annually or over several years.

The horizontal dashed line indicates the cumulative rate of inflation. The SM system granted real wage increases up to the 14th percentile, while for all wages above that level the SM alone implied real wage cuts. Among the lowest percentiles of the distribution the SM adjustments were very substantial, of the order of 200% in nominal terms and 200-157=43% in real terms. Symmetrically, the SM mandated substantial real wage cuts at the top: the cumulative nominal percent increase in the top decile was 20% over the entire period compared to a cumulative inflation rate of 157%.

Total wage changes (the solid line) are larger than the SM adjustment because they also incorporate any additional wage change that could be negotiated between employers and employees at the individual or at the firm level. National contracts normally defined the parameters within which these additional components could be set but the general principle was that any variation beyond the national contract could only improve working conditions. Hence, all additional salary components could only be positive (or zero).[23] Eventually, during the period 1976-1982, real wages increased overall by about 70% on average but by around 200% in the bottom decile and by only 18% in the top decile (and virtually zero at the very top of the distribution).

4 Empirical strategy

The theoretical model of Section 1 suggests that the effects of exogenous changes in the real wages of low skilled workers are heterogeneous across firms depending on their employment composition ρ. The SM is a labour market institution that generates precisely these effects, namely exogenous increases in real wages at the bottom of the wage distribution. Consistent with this interpretation, our empirical analysis proceeds by first constructing a firm-specific indicator of ρ and then looking at how individual and firm outcomes vary along its distribution. We focus on six outcomes: (i) individual wages changes, (ii) the dispersion of wages within firms, (iii) turnover across employers, (iv) workers' exit from the sample, (v) firm exit and (vi) firm growth.[24]

[23] Collective bargaining in Italy was (and still is) organised in several levels: national contracts were legally binding for all firms and workers within the sector, regardless of their affiliation with the trade unions or the employers' federation (the so-called *erga omnes* clause); additional salary components could potentially vary across firms within the same sector, across groups of workers in the same firm and even at the individual level. National wage agreements were signed normally every 3 years and set (among other things) the base salary at the sectoral level. The collective bargaining system in Italy has remained virtually unchanged until the early 1990s. See Erikson and Ichino (1995) and Guiso *et al.* (2005) for more details.

[24] Unfortunately, a number of interesting outcomes, such as dismissals, prices, profits and possibly investment in training and technology, cannot be directly observed in our data due to the limitations discussed in Section 2.

4.1 Measuring SM treatment intensity (ρ)

In the model of Section 1, ρ is the key parameter determining the magnitude of the effects of changes in the real wage of the unskilled workers ($\overline{w}$) on a variety of outcomes. More specifically, ρ is the firm specific share of workers who are paid the wage $\overline{w}$ and are therefore affected by its changes.

We interpret the SM as a labour market institution that induces exogenous increases in $\overline{w}$ and, consistently with the model, we measure ρ with the firm-specific share of employees who receive positive real wage increases from the SM. Our underlying assumption is that the SM is essentially irrelevant when it mandates negative real wage cuts. During the time period that we consider, Italy was growing at relatively sustained rates of about 4% per year and undergoing a process of tertiarisation, with the productivity of white collar skilled workers increasing at a faster pace than that of unskilled blue collars. Hence, it seems very reasonable to assume that the SM was not directly binding for workers in the mid and upper part of the distribution, whose productivity was fast increasing (Erikson and Ichino, 1995; Manacorda, 2004).

To avoid complications with the empirical identification of our parameters of interest, we measure ρ in 1976, the year just before the introduction of the SM. More specifically, for each firm j we compute the share of its 1976 (full-time equivalent) employees with positive SM real wage adjustments. We call this indicator *SM burden* and we label it SM_j. In constructing this measure we consider all the workers who were employed at the firm in 1976 and we compute their cumulative SM wage adjustments under the assumption that they would remain continuously employed at the same firm throughout the period.

Notice that it is only thanks to the richness of our data, which include information on all workers of all firms, that we can construct this variable and investigate how the SM affected the bargaining of wages within the firm. In Section 6.2 we experiment with alternative measures of SM_j and we show that our results are robust to the use of different indicators.

Table 3 shows some basic descriptive statistics about SM_j in our largest sample of firms. A mean value of $SM_j = 0.481$ indicates that almost 50% of the employees of the average firm were supposed to obtain real pay raises from the SM between 1976 and 1982. But the distribution of the SM burden across firms is highly skewed: 22.7% of all firms had a value of $SM_j = 0$: in those firms no employee expected positive real SM adjustments. SM_j clearly correlates positively with the share of employees in the bottom quintile of the wage distribution and negatively with the share of those

Table 3: *SM_j and Firm's Employment*

	% firms	Mean	s.d.	Share of white collars[a]	Share of workers in bottom quintile[a]	Share of workers in top quintile[a]
SM_j		0.481	0.419			
$SM_j = 0$	0.227	0.000	0.000	0.177	0.000	0.204
$0 < SM_j \leq \overline{SM}$	0.183	0.110	0.066	0.140	0.221	0.136
$SM_j > \overline{SM}$	0.589	0.782	0.271	0.115	0.831	0.010

[a] In the firm's total employment in 1976.
All statistics are computed over the sample of 67,665 firms included in our sample.
SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details). $\overline{SM}$ is the mean SM_j in the sample.

in the top quintile. Interestingly, the correlation is not very strong with the share of white-collars workers in the firm. There is in fact large dispersion in the distribution of wages of the two groups of white- and blue-collar workers, and eventually the two distributions overlap substantially. In order to explore non-linearities, we also discretise the distribution of SM_j and we classify firms into 3 groups: those with zero SM burden, those with SM_j below average and those with SM_j above average.[25]

To clarify the impact of the SM on wages, in Figure 2 we plot the distribution of annualised individual wage changes over our main period of analysis (1976-1982), separately for the part mandated by the SM and for the remaining part negotiated on top of the SM. The sum of these two components equals the total wage change. The vertical bar indicates the accumulated rate of inflation over the period. Consistent with the evidence on Figure 1, the top panel shows that SM changes were larger than inflation for about 15% of workers and that negotiated changes were almost entirely positive. The other two panels of Figure 2 reproduce the same distributions separately for workers in the bottom (mid panel) and in the top (bottom panel) quintiles of the baseline distribution of wages in 1976. This breakdown shows that workers in the bottom quintile have larger SM changes and smaller negotiated wage changes; the opposite occurs at the top quintile of the wage distribution.

In Figure 3 we focus on the role of the SM burden and we replicate the analysis of Figure 2 for three types of firms: those with zero SM_j (left column), those with

[25] This discretisation is meant to group firms that are sufficiently different in the degree to which the SM affects them. Given the skewed distribution of SM_j, this leads us to construct groups of rather different sizes. In Table A2 in the Online Appendix we reproduce our analysis with a more even split of the distribution of SM_j in quartiles.

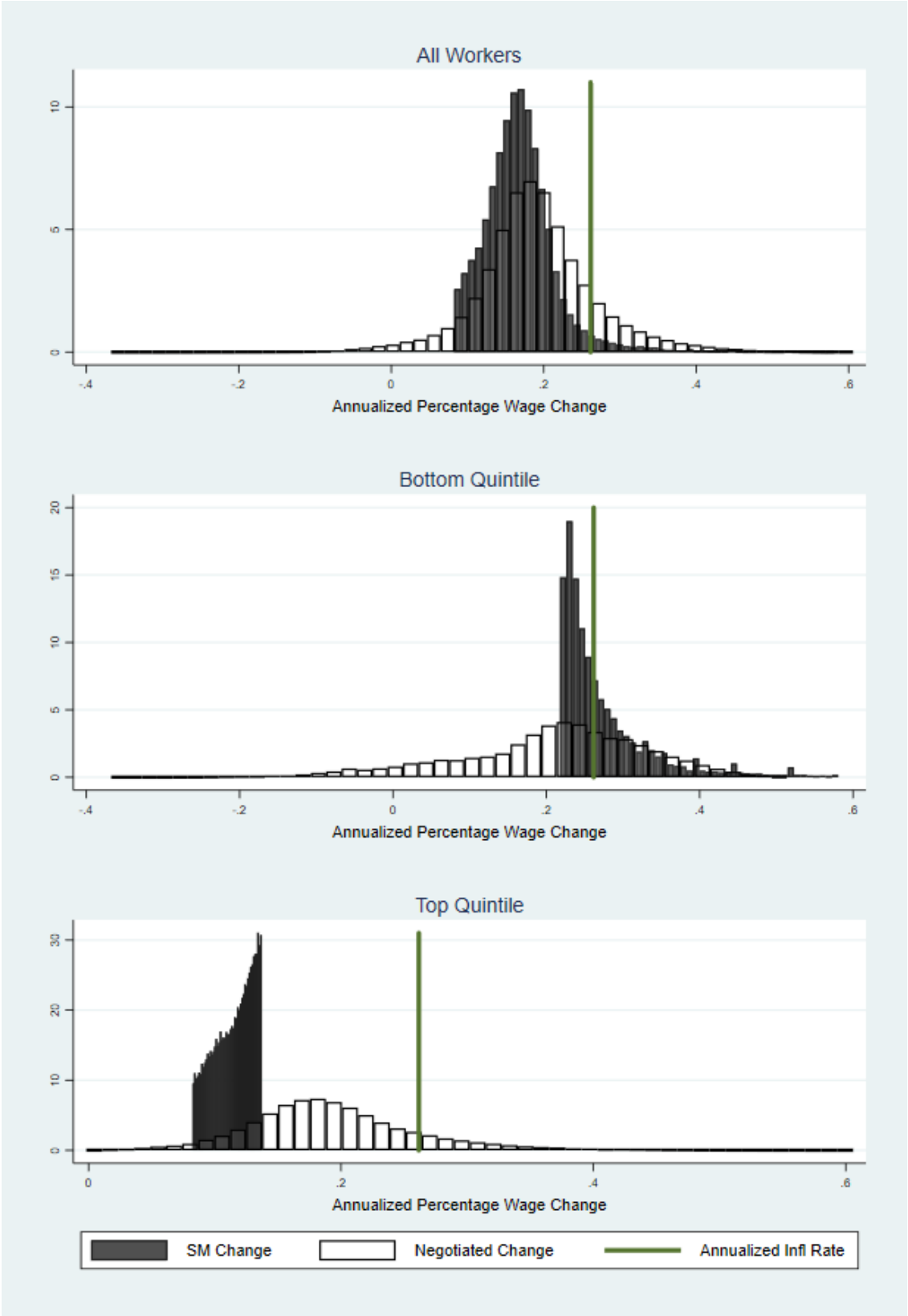

Figure 2: *Wage Changes by SM and Negotiated Margin*

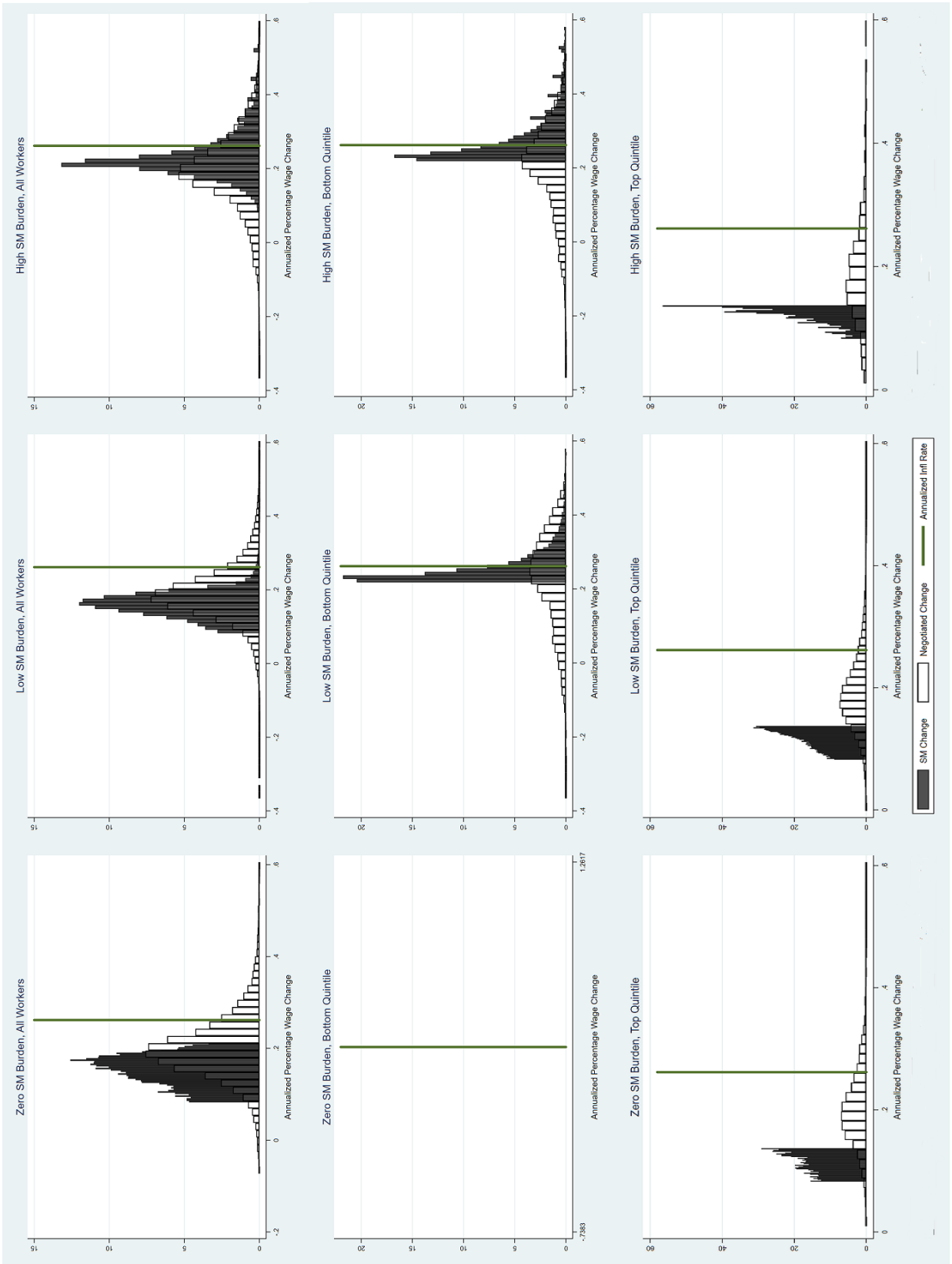

Figure 3: *Wage Changes by SM and Negotiated Margin, by SM Burden*

positive SM_j but lower than the mean of the firms active in 1976 (mid column) and finally those with SM_j larger than the mean (right column). We find that workers in firms with high SM burden receive lower negotiated wage changes than workers who work in firms with zero burden (firms with no workers who get positive real SM adjustments, i.e., no workers in the first quintile of the wage distribution); this is more evident for workers at the top quintile of the wage distribution and less so for workers at the bottom quintile.

This preliminary descriptive analysis indicates that the SM appears to have had distinctively different effects across different types of firms. More specifically and consistent with the predictions of the model in Section 1, workers who started off in the upper part of the wage distribution mechanically received lower SM adjustments in real terms and were only partly compensated via additional negotiated wage increases. Furthermore, this compensation was significantly lower in firms employing many low paid workers in 1976.

4.2 Identification

Our main empirical exercise consists in the estimation of the differences, either across firms with different SM burdens or across workers employed at firms with different SM burdens, in six outcomes: three at the worker level and three at the firm level. The three worker level outcomes are wage changes, worker exit (from the sample) and turnover. The three firm level outcomes are within-firm wage dispersion, firm exit and firm growth (in employment).

The specifications of empirical models are slightly different depending on the nature of the outcome variable, whether it is an individual or a firm outcome. For individual outcomes we estimate the following specification:

$$y_{ij} = \beta SM_j + \beta^j \pi_{W_{i(76)}} + \gamma^j X_{ij} + \varepsilon_{ij} \tag{6}$$

where the dependent variable y_{ij} is either the total cumulative wage change experienced by worker i employed (in 1976) in firm j, $\left(\frac{W_{i(82)}-W_{i(76)}}{W_{i(76)}}\right)$; or a dummy indicator for whether the worker exited the sample or ever changed employer over the period of analysis.

In order to investigate how the SM differentially affected workers at various points of the initial distribution of wages, we introduce among the explanatory variables the

percentile of the distribution of $W_{i(76)}$, which we indicate with $\pi_{W_{i(76)}}$.[26] The vector X_{ij} includes a constant term, dummies for occupation (white and blue collars), a gender dummy and a quadratic function of age. To control for local labour market conditions we also include in X_{ij} a full set of dummies for the province of residence of the worker and the share of firms located in the worker's municipality of residence which closed down between January and December 1976.[27] ε_{ij} is an error term capturing all other factors that affected the bargaining of wages and that are unobservable in our data.

We are particularly interested in the differential effect of the SM across firms, thus we allow the coefficients of equation 6 to vary across firms depending on the SM burden, both linearly and non-linearly, by fully interacting the model with dummy indicators for three groups of firms based on the distribution of SM_j, namely firms with $SM_j = 0$, firms with SM_j below average and firms with SM_j above average (see results in Table 4).

In our preferred specification, we further augment the set of controls with firm fixed effects, which guarantee a more robust identification of the parameters β^j, which are our primary object of interest, at the cost of losing identification of β, as SM_j is collinear to the firm fixed effects.[28]

We now move on to describing the models that we estimate at the firm level. The outcomes that we consider are changes in wage dispersion within firm, firm exit and firm employment growth. The empirical specification is the same for all these dependent variables:

$$h_j = \delta SM_j + \eta Z_j + e_j \tag{7}$$

where h_j is either the change in some measure of wage dispersion within firm j (the

[26] We use the percentile rather than $W_{i(76)}$ itself to avoid the division bias induced by the presence of $W_{i(76)}$ in the denominator of the dependent variable.

[27] There are 7 provinces in Veneto, ranging from 200 to 900 thousands inhabitants, and 567 municipalities.

[28] Manacorda (2004) is primarily interested in the effect of the SM on the overall distribution of wages. He uses aggregate data by percentile and gender, thus he cannot look at anything happening within firms. In particular, he cannot compute any measure of the burden imposed by the SM on the firm. He estimates an equation that can be related to our equation 6, without any reference to SM_j and adding the percentage SM adjustment as a regressor:

$$\Delta w_i = \alpha \Delta w_i^s + \beta \pi_{W_{i(76)}} + \gamma X_i + \varepsilon_i$$

where $\Delta w_i = \frac{W_{i(82)} - W_{i(76)}}{W_{i(76)}}$ and $\Delta w_i^s = \frac{s\Delta P}{W_{i(76)}}$. His primary interest is the estimation of the parameter α, which measures the degree to which the SM was offset by bilateral negotiations between workers and employers. The main identification issue is the high collinearity of Δw_i^s and $\pi_{W_{i(76)}}$, which is solved by computing the latter variable as the percentile in the gender-specific distribution of initial wages rather than the overall distribution. Using the same strategy we can replicate his results very closely: our estimate of α is 0.682 which is very similar to Manacorda's 0.647.

standard deviation of log wages, the ratio of the 50th to the 25th percentile and the ratio of the 50th to the 75th percentile); or an indicator for whether firm j disappeared from the archive or increased employment between 1976 and 1982. Z_j is a vector of firm specific controls including firm size and size squared (measured in full-time equivalent employees), the share of female workers in each firm, the average age of the workers (and its square), a dummy for firms established before 1974 (the variable is left-censored), three sector dummies and the share of white collars, all measured in 1976.

Notice that equations 6 and 7 are subject to attrition issues of different nature. In the individual-level equations workers might move to non-employment or to employment in a sector not covered by our data (public sector and self-employment), whereas in the firm-level equations firms might exit and enter the market. In equation 6 workers must be employed both in year 1976 and in year 1982 but they might change firm between the two years; in equation 7 the firm's employees in 1976 and 1982 do not need to be the same workers. In section 6 we exploit the differences between equations 6 and 7 to show that sorting and selection issues do not modify the main findings of our analysis.

Before showing the results of the estimation of our equations we discuss here some important identification issues. Our identification strategy rests crucially on variation in SM_j. This is defined exclusively on the basis of pre-determined variables - the composition of employment at the firm in 1976 - and the statutory rules of the SM, both of which can be safely considered to be exogenous to our outcomes of interest. Nevertheless, identification issues may arise due to the inevitable correlation between SM_j and a number of firm characteristics, particularly with the baseline composition of employment in 1976 (see Table 3). This raises a problem with the interpretation of our results that could be attributed more to the particular mix of workers employed at the firm in 1976 rather than the burden of the SM.

This is a reasonable concern, as confirmed by Table A1 in the Online Appendix, which reports means and standard deviations for the full set of our individual and firm observables, broken down by our three groups of firms. As one could easily predict, there are sizeable and significant differences in many dimensions across the three groups and the differences persist even when breaking down the sample of workers by their quintiles in the distribution of wages in 1976.

The question is, then, whether and how much these differences explain the heterogeneity in outcomes across the distribution of wages and across treatment intensities. Our key identification assumption is that time effects (both observable and unobserv-

able) are the same across firms with different treatment intensities, as in a standard differences-in-differences approach. Of course, there is no direct test of such assumption, nevertheless we can test whether prior to treatment heterogeneity in outcomes was related to future treatment status. In other words, we can estimate our equations prior to 1977 and investigate whether the parameters vary according to the intensity with which the SM would hit the employing firms in 1977. Unfortunately, our data start in 1975 and we can only look at very short-run pre-treatment outcomes, namely changes between 1975 and 1976.

We report the results of this test in Section 6.2 together with a series of other robustness checks that support of our identification strategy. More specifically and in addition to using information prior to the introduction of the SM in 1977, we also exploit the gradual abolition of the system with a first reform in 1983, then in 1986 and finally suppressed in 1992. Our results indicate that all the effects that we document in our main analysis and that we attribute to the SM were either much weaker or not present both before the introduction of this indexation mechanism and once it was weakened.

5 Results

In this section we present the results of the estimation of the equations discussed in Section 4. For clarity, we organise the exposition by theme (wages and turnover) rather than by type of specification (worker-level and firm-level). In Section 5.1 we look at wage outcomes: individual wage changes and within-firm dispersion. In Section 5.2 we present results on entry, exit and turnover of individuals and on exit and growth of firms.

5.1 Wage outcomes

The results of the estimation of equation 6 for wage changes are presented in Table 4. For simplicity we report only the estimates of the β and β^j coefficients and, in order to investigate potential non-linearities, in Panel B we replace $\pi_{W_{i(76)}}$ in equation 6 with quintile dummies (omitting the 3rd quintile as a reference category). Each column in each panel is a separate regression.

Our simplest specification (column 1, Panel A) shows that workers employed in firms with higher SM burdens received higher wage increases but only up to around the 35th percentile. For workers earning higher wages in 1976, being employed in a high

Table 4: *Wage Changes under the SM (1976-1982)*

	Full sample		$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
			Panel A		
$\pi_{W_{i(76)}}$	-0.013***	-0.016***	-0.017***	-0.017***	-0.025***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SM_j	0.572***	–	–	–	–
	(0.006)				
$\pi_{W_{i(76)}} \times SM_j$	-0.016***	-0.012***	–	–	–
	(0.000)	(0.000)			
			Panel B		
SM_j	0.290***	–	–	–	–
	(0.008)				
$\pi_{W_{i(76)}} \times SM_j$	-0.009***	–	–	–	–
	(0.000)				
1^{st} quintile[a]	0.862***	0.967***	–	1.019***	0.903***
	(0.005)	(0.004)		(0.005)	(0.014)
2^{nd} quintile[a]	0.214***	0.264***	0.237***	0.249***	0.317***
	(0.003)	(0.003)	(0.012)	(0.003)	(0.014)
4^{th} quintile[a]	-0.173***	-0.204***	-0.234***	-0.199***	-0.278***
	(0.003)	(0.003)	(0.010)	(0.003)	(0.020)
5^{th} quintile[a]	-0.418***	-0.466***	-0.556***	-0.455***	-0.581***
	(0.003)	(0.003)	(0.012)	(0.003)	(0.027)
Observations	423,614	423,614	33,594	323,275	66,745
Firm FE	No	Yes	Yes	Yes	Yes

[a] Quintile of the distribution of wages in 1976.

The dependent variable is the percentage difference of gross annual wages between 1976 and 1982.

SM_j is the firm share of workers receiving real pay raises from the SM.

$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.

All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.

Each column in each panel is a separate regression.

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

SM_j firm was associated with lower wage growth. Results are similar in column 2, where we add firm fixed effects. For workers employed in firms with $SM_j = 0$ moving up one percentile in the wage distribution was associated with a lower Δw_{ij} of about 1.6 percentage points over an average total cumulative change of 226% in the period. This gradient becomes significantly more negative in firms with larger SM burdens, by about 0.01 of a percentage point for each point increase in SM_j (recall that SM_j ranges between 0 and 1). In columns 3 to 5 we re-estimate the model separately for each of the three groups of firms and we document that there is not much difference between firms with zero and mild SM burdens. In firms that were heavily affected by the SM system (SM_j larger than average, column 5) moving up one percentile in the initial distribution of wages reduced wage growth by 2.5 percentage points, much more than in other firms.[29]

In Panel B we investigate non-linearities along the distribution of initial wages and replace $\pi_{W_{i(76)}}$ in equation 6 with quintile dummies (omitting the 3rd quintile as a reference category). We present coefficients estimated with and without fixed effects. Results show that workers in the first two quintiles enjoyed wage changes higher than the median while those in the last two quintiles got substantially lower raises. This pattern is exacerbated in firms with high SM burdens.[30]

The results of Table 4 suggest that the distribution of wages within the firm became more compressed, both from the bottom and from the top, and that this effect was stronger in firms with a higher SM burden. In Table 5 we look directly at the effect of the SM on the compression of the within-firm distribution of wages. We estimate equation 7 using as dependent variables the changes between 1976 and 1982 of three alternative indicators of the dispersion of wages within the firm. These three measures are meant to capture dispersion at different points of the distribution and are: the standard deviation of log wages, which measures overall dispersion; the ratio between the 25th and the 50th percentiles, which captures dispersion at the bottom of the distribution; and the ratio between the 50th and 75th percentiles, which captures dispersion at the top.

The results for the standard deviation of log wages are reported in the first column of Table 5 for the overall sample of firms and in the fourth column for the sample

[29] In Table A2 in the Online Appendix we show the results of the same specification using a split of SM_j in quartiles. The table shows that most of the estimated effect comes from the top quartile of the distribution, i.e., workers in the 25% least skill intensive firms (where the coefficient is 2.2 against 1.7 in all other quartiles), but otherwise the overall results are very similar to those in Table 4.

[30] In Table 4 the first quintile is missing for firms with $SM_j = 0$ because in these firms there are no workers in the bottom quintile, by definition., as already seen in Figure 3.

of firms with at least 15 employees.[31] We expect the SM to trigger a stronger redistribution within larger firms, where there is more room to redistribute across many co-workers, and the threshold of 15 employees is meaningful in Italy because firms above this threshold were subject to substantially stronger employment protection regulation.

In Panel B we investigate non-linearities and we replace SM_j with the three group dummies (and we exclude the constant). Results show that in firms characterised by higher SM burdens the distribution of wages became more compressed over time. The magnitude of this effect is of the order of about 0.03 points (over a negative average change of 4 points) for each percentage point increase in the SM burden. In line with with our intuition, this effect was more pronounced in larger firms, where there was more scope to redistribute resources across co-workers (column 4).

Panel B of Table 5 further indicates that no compression was taking place in firms with no SM burden ($SM_j = 0$): in those firms wages were actually getting more dispersed. On the other hand, firms with positive SM burdens were compressing their distributions and the more so when the burden was high. The same pattern is observed in large firms.

The other columns of Table 5 (columns 2, 3, 5 and 6) report results from similar regressions where we replace the dependent variable with our indicators of changes in dispersion at the bottom and at the top of the firm distribution. We find that the overall compression of wages within the firm that we highlighted in columns 1 and 4 was the result of a pervasive process affecting the entire distribution. In fact, both the 25th and the 75th percentiles moved significantly closer to the median and the more so in firms with high SM burdens (and in larger firms).

To check the consistency of these results with the previous ones on changes in individual wages, we computed within-firm dispersion imputing wages in 1982 on the basis of our estimates of equation 6 instead of the actual observed wages.[32] We obtain measures of dispersion that are very comparable to the actual ones. For example, focusing on firms with more than 15 employees where estimation error is more limited,

[31] The number of observations in Table 5 is different from the number of firms in which we observe the workers of our restricted sample used for the regressions in Table 4, namely the 67,733 firms indicated in Table 1. This is because here we focus only on those firms that were active both in 1976 and in 1982. In Section 6.1 we compare results across different samples of firms and workers and between individual and firm-level outcomes to show that our findings are robust to selection issues.

[32] Technically, we impute wages in 1982 by taking wages in 1976 and adding the wage changes predicted by our estimates of equation 6. The predicted wage change is itself computed using the linear prediction of the model and adding random term drawn from the asymptotic distribution of the error term.

Table 5: *Wages within Firm (1976-1982)*

	All Firms			Firms with $>$ 15 employees		
	ΔStd.Dev	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$	ΔStd.Dev	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel A			
SM_j	-0.031***	0.017***	-0.047***	-0.068***	0.053***	-0.088***
	(0.003)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
			Panel B			
$SM_j = 0$	0.055***	-0.042***	-0.086***	-0.014	0.167***	-0.175***
	(0.014)	(0.012)	(0.016)	(0.036)	(0.031)	(0.041)
$0 < SM_j < \overline{SM}$	-0.068***	0.029***	-0.113***	-0.080***	0.188***	-0.180***
	(0.014)	(0.012)	(0.016)	(0.036)	(0.031)	(0.040)
$SM_j \geq \overline{SM}$	-0.074***	0.045***	-0.159***	-0.109***	0.227***	-0.218***
	(0.013)	(0.011)	(0.016)	(0.035)	(0.030)	(0.039)
Observations	33,134	33,134	33,134	5,572	5,572	5,572

The dependent variables are the changes in three measures of the dispersion of wages within firms: (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6).
SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).
All specifications include the following firm controls: a constant, share of female workers, average age of workers and its square, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the standard deviation of log wages within firms in 1982 is on average across firms equal to 0.22 in the real data, with a minimum of 0.01 and maximum around 0.75. The same statistics computed using imputed wages in 1982 are 0.19 for the average, 0.014 and 0.74 for the minimum and the maximum respectively.

Overall the results presented in this section suggest that the SM, a labour market institution that was essentially irrelevant for workers above the bottom quintile of the initial distribution of wages, contributed to compressing the distribution of wages also in the upper part of the distribution. It is hard to imagine a direct effect of the SM for high wage earners, for whom the system was merely imposing minimum pay rises largely below inflation. In addition, we are looking at a period of time when the country was experiencing both tertiarisation and technical change, suggesting that productivity was presumably growing faster for the skilled workers than the others. In this context it is very reasonable to assume that the SM was not binding at the top of the distribution, where productivity was growing fast and was presumably been reflected into wages. Hence, the effects that we document can really only be generated by some sort of spillover. The significance and magnitude of the estimates in Table 5 further suggest that such spillovers were mostly taking place within the firm.

Given the above results, it is reasonable to expect that the SM could have also affected worker turnover, especially among skilled workers employed in firms with high SM burdens. In turn, the system could also have important effects on firm growth and survival. In the next subsection we look at these other outcomes.

5.2 Labour turnover and firm dynamics

Results of equation 6 with worker turnover as a dependent variable are reported in Table 6 in the same format used for the previous table on wage changes (Table 4). For readability all coefficients have been multiplied by 100. As expected the baseline effect reported in the first row of panel A shows that higher paid individuals in 1976 were less likely to leave their initial firms by 1982. However, this relation was significantly less steep in firms with a high SM burden: we estimate a decrease of about 0.1 percentage points for each point increase in SM_j. In other words, higher paid individuals were more likely to change employer if they were initially employed in high-burden firms than in low-burden firms. This is even more evident when we split the sample into our three groups of firms (columns 3 to 5).

In Panel B we replace $\pi_{W_{i(76)}}$ with a set of quintiles dummies. Similarly to Table 4, we report parameters estimated with and without firm fixed effects. The estimated

Table 6: *Probability of Changing Employer*

	Full sample		$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
			Panel A		
$\pi_{W_{i(76)}}$	-0.258***	-0.168***	-0.146***	-0.156***	-0.117***
	(0.000)	(0.004)	(0.020)	(0.004)	(0.012)
SM_j	1.859***	–	–	–	–
	(0.005)				
$\pi_{W_{i(76)}} \times SM_j$	0.463***	0.104***	–	–	–
	(0.000)	(0.000)			
			Panel B		
SM_j	0.689	–	–	–	–
	(0.580)				
$\pi_{W_{i(76)}} \times SM_j$	0.525***	–	–	–	–
	(0.016)				
1^{st} quintile[a]	13. 680***	8.229***	–	9.599***	5.846***
	(0.376)	(0.253)		(0.298)	(0.707)
2^{nd} quintile[a]	3.163***	2.821***	2.619***	2.875***	1.703**
	(0.229)	(0.188)	(0.888)	(0.202)	(0.695)
4^{th} quintile[a]	-4.480***	-2.741***	-2.563***	-2.789***	0.016
	(0.210)	(0.173)	(0.743)	(0.180)	(1.015)
5^{th} quintile[a]	-10.958***	-3.453***	-4.285***	-3.377***	-0.289
	(0.228)	(0.212)	(0.918)	(0.220)	(1.370)
Observations	423,614	423,614	33,594	323,275	66,745
Firm FE	No	Yes	Yes	Yes	Yes

[a] Quintile of the distribution of wages in 1976.

The dependent variable is a dummy equal to one for workers who changed employer at least once between 1976 and 1982.

SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).

$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.

All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.

Each column in each panel is a separate regression.

All coefficients have been multiplied by 100 for readability. Standard errors in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

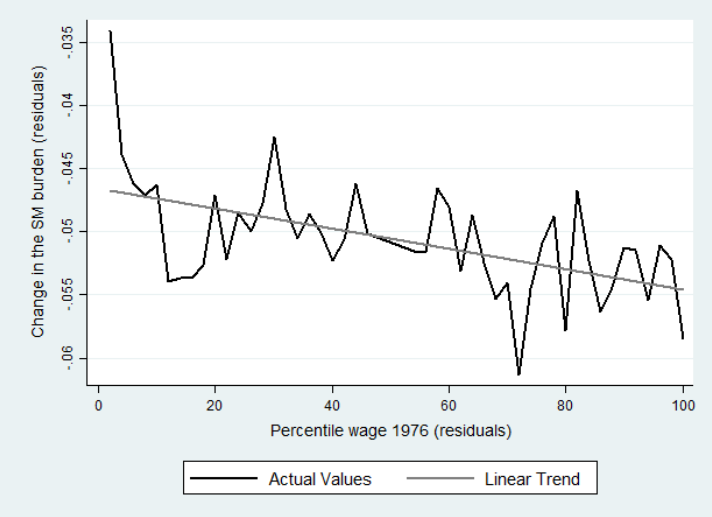

Figure 4: *Changes in Firm Characteristics for the Job Movers (1976-1982)*

coefficients are always positive and significant in the two lower quintiles indicating that low-paid workers tended to leave the initial firm more than the median worker. Higher paid individuals were less likely to leave, except in the last column: in high-burden firms high paid workers were more likely to leave than in low-burden firms.[33]

Combined with our previous findings on wage changes, this evidence is consistent with the idea that employers with a large share of unskilled workers in 1976 were forced by the SM to pay large real wage increases to their unskilled workers. Adjustment costs and frictions made it difficult to adjust entirely by dismissing unskilled workers or by changing production technologies. Hence, these firms were forced to lower the pay rises for their skilled employees, who tended to leave, mostly towards more skill-intensive employers. We document this in Figure 4, which investigates the characteristics of the destination firms towards which job changers move.

To construct this figure we consider only the job movers and for each of them we compute the difference in the SM burden of their firms in 1982 and in 1976. We apply a simple partitioned regression procedure. First, we regress the difference in the SM burden on all our usual covariates but excluding $\pi_{W_{i(76)}}$ and we take the residuals. Then, we regress (the log of) $W_{i(76)}$ on the same set of controls and take the residuals. Finally, for each percentile of the residuals of the wage regression we plot on the graph the average residual of the first regression. The clear negative correlation shown in Figure 4 indicates that the better paid workers were moving away from firms with

[33] All the reported coefficients are statistically different from each other at the 99% level across columns.

Table 7: *Wage Changes of Movers and Stayers*

	Full sample	$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
$\pi_{W_{i(76)}}$	-0.016***	-0.016***	-0.017***	-0.025***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{W_{i(76)}} \times SM_j$	-0.012***	–	–	–
	(0.000)			
$mover_i = 1$	0.070***	0.003	0.046***	0.205***
	(0.003)	(0.009)	(0.003)	(0.009)
$[mover_i = 1] \times [Q5 = 1]$	-0.048***	-0.196***	-0.023***	0.189***
	(0.005)	(0.015)	(0.005)	(0.038)
Observations	423,614	33,594	323,275	66,745

The dependent variable is the percentage difference of gross annual wages between 1976 and 1982.
$mover_i$ is a dummy equal to one for workers who changed employer at least once between 1976 and 1982.
$Q5 = 1$ is a dummy equal to one for workers who are in the fifth quintile of the distribution of wages in 1976.
SM_j is the firm share of workers receiving real pay raises from the SM (see Section 4 for details).
$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

high SM burdens towards firms with lower SM burdens.[34]

In Table 7 we provide further evidence showing that such moves were indeed profitable, namely that high wage workers who moved away from high SM burden firms enjoyed larger wage increases than their colleagues who remained behind. Specifically, the table replicates the regressions in Table 4 (only Panel A, for brevity) augmenting them with a dummy to identify workers who changed firm between 1976 and 1982. In order to look more specifically at high-wage workers we further interact the mover dummy with a dummy for workers in the top 20% of the original distribution of wages. Overall, movers enjoyed a 7 percentage point wage increase with respect to workers who did not change firm between 1976 and 1982. However, such an average increase was not uniformly distributed among movers: for workers who left firms with zero SM burden we do not detect any additional wage gain, while for workers who

[34]The sample used to construct Figure 4 is relatively small, as we can only use those job movers whose destination firms existed also in 1976. This explains the large variability displayed in the graph and we highlight the negative correlation by including a linear fit besides the actual estimated values.

left firms with high SM burdens we find a much larger wage increase. This last result is even stronger for workers in the top 20% of the wage distribution, who witnessed a further increase in their wage change only if they moved away from a high SM burden firm.

Besides skilled workers voluntarily quitting firms, one should also expect higher firing rates for unskilled workers, especially in firms with high SM burdens. Unfortunately, our data do not allow us to identify dismissals nor the status of workers who disappear from the sample. These workers could be unemployed but also inactive or employed in sectors of the economy that are not covered by our data (mostly the public sector and self-employment). Nevertheless, we can look at the probability of exiting from our dataset for workers who were present in 1976 and we can further explore whether such probability varies with the SM burden of the firm in which they were employed in 1976. We do so by estimating equation 6 with a dummy equal to one if the worker exited the sample by 1982 as a dependent variable and we report the results in Table 8 using the same format of the previous tables. We find that less paid individuals were indeed more likely to exit our sample by 1982 and the more so when they were initially (in 1976) employed in firms with high SM burdens. Despite the limitations of our data and some non-linearities of the estimated effects, the results in Table 8 confirm the intuition that part of the adjustment to the SM also took place via some firing of low skilled workers.

With high-paid workers leaving and ever increasing SM burdens, one could expect the least skill-intensive firms to be more likely to go out of business and less likely to grow. To nvestigate the first hypothesis, we estimate equation 7 with a dummy for firm exit as a dependent variable. This is a dummy indicating whether a generic firm j, which was active in 1976, exited the sample in 1982. The results are reported in Table 9 and indicate that the likelihood of exiting the market increased with the burden of the SM: a percentage point increase in SM_j leads to 0.068 of a percentage point increase in the exit probability (over an average of around 34%). The effect was stronger in larger firms, where the exit probability increased by 0.1 of a percentage point (over an average exit probability of 20%) for each percentage point increase in the SM burden.

In Panel B of Table 9 we replace the SM burden with the usual three group dummies (and we exclude the constant). We find some non-linearites among the smaller firms but for the larger ones there is a clear trend towards higher exit rates when SM_j is larger.

Our rich data also allow us to look at the other dimension of firm performance

Table 8: *Probability of Exiting Private Employment*

	Full sample		$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
			Panel A		
$\pi_{W_{i(76)}}$	-0.211***	-0.234***	-0.002	-0.224***	-0.147***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SM_j	2.229***	–	–	–	–
	(0.003)				
$\pi_{W_{i(76)}} \times SM_j$	0.102***	0.117***	–	–	–
	(0.000)	(0.000)			
			Panel B		
SM_j	-5.859***	–	–	–	–
	(0.003)				
$\pi_{W_{i(76)}} \times SM_j$	0.286***	–	–	–	–
	(0.000)				
1^{st} quintile[a]	17.917***	15.665***	–	18.272***	6.748***
	(0.002)	(0.002)		(0.002)	(0.007)
2^{nd} quintile[a]	5.071***	4.374***	2.154***	4.433***	-0.936
	(0.002)	(0.002)	(0.007)	(0.002)	(0.007)
4^{th} quintile[a]	-2.918***	-1.670***	-1.014	-1.543***	0.900
	(0.002)	(0.002)	(0.007)	(0.002)	(0.010)
5^{th} quintile[a]	-3.314***	-0.659***	2.104***	-0.581***	5.382***
	(0.002)	(0.002)	(0.008)	(0.002)	(0.013)
Observations	736,318	736,318	55,640	544,971	135,707
Firm FE	No	Yes	Yes	Yes	Yes

[a] Quintile of the distribution of wages in 1976.

The dependent variable is a dummy equal to one for workers who exited private employment at least once between 1976 and 1982.

SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).

$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.

All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.

Each column in each panel is a separate regression.

All coefficients have been multiplied by 100 for readability. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: *Probability of Firm Exit*

Dependent var.= probability of firm exit[a]	All Firm	Firms with more than 15 employees
	Panel A	
SM_j	0.068***	0.100***
	(0.005)	(0.025)
	Panel B	
$SM_j = 0$	0.552***	0.256**
	(0.020)	(0.126)
$0 < SM_j < \overline{SM}$	0.461***	0.295**
	(0.021)	(0.124)
$SM_j \geq \overline{SM}$	0.542***	0.345***
	(0.019)	(0.121)
Observations	67,733	6,515

[a] The dependent variable is a dummy equal to one for firms which ceased operating at some point between 1976 and 1982. The sample includes all firms that were operating in Veneto in 1976.
SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).
All specifications include the following firm controls: average workers' age (and squared), proportion of female workers, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers. The results are estimated with OLS.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: *Firm Growth*

	All Firms		Firms > 15 employees	
	1=hiring[a]	Δ FTE employment[b]	1=hiring[a]	Δ FTE employment[b]
		Panel A		
SM_j	-0.034***	-1.569***	-0.152***	-9.504
	(0.006)	(0.488)	(0.033)	(7.040)
		Panel B		
$SM_j = 0$	1.101***	3.179	1.498***	98.064***
	(0.028)	(2.132)	(0.166)	(35.352)
$0 < SM_j < \overline{SM}$	1.069***	4.569**	1.484**	96.232***
	(0.028)	(2.185)	(0.165)	(35.077)
$SM_j \geq \overline{SM}$	1.052***	2.660	1.443***	92.908***
	(0.027)	(2.055)	(0.161)	(34.199)
Observations	44,575	44,575	5,605	5,605

[a] The dependent variable is a dummy equal to one for firms which hired new workers between 1976 and 1982.

[b] The dependent variable is the difference in full-time equivalent employment of the firm between 1976 and 1982.

SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).

All specifications include the following firm controls: average workers' age (and squared), proportion of female workers, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers. The sample includes all firms that were operating in Veneto in both 1976 and 1982.

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

mentioned above, namely employment growth. To this aim, we take all the 44,500 firms that are observed both in 1976 and in 1982 and we compute (i) a dummy indicator taking value one if the firm hired new workers between 1976 and 1982 and (ii) the difference in full-time equivalent employment between these two years. Table 10 reports the estimates of equation 7 obtained using each of these indicators as dependent variables.

We find that firms with higher SM burden were less likely to hire new employees by about 3.4 percentage points for each percentage point increase in the SM burden. When looking at net growth in employment, the results are similar: firms with high SM burden (above the mean) grew by about 1.5 full-time equivalent unit less than firms with no burden. As expected, this effect is stronger in bigger firms.

To sum up, our empirical results can be summarised in the following way. As the SM system mandated higher nominal wage adjustments (i) total wage changes were lowered, especially for high-paid workers, (ii) who were particularly penalised

when employed in firms that were heavily affected by the SM and (iii) tended to leave such firms to move towards more skill-intensive ones; at the same time, (iv) unskilled workers were more likely to leave private dependent employment and (v) firms with high SM burdens were more prone to exit the market and less likely to hire new employees or grow in size.

6 Robustness Analysis

There are two important dimensions along which our results need to be checked. First, given that our primary interest is on longitudinal changes, we are forced to select our samples based on statistical units (individuals or firms) that are present in our data both at the beginning and at the end of the period under consideration. This selection criterion leads us to work with samples that are smaller than the populations observed in any given year and may therefore rise questions about the representativeness of our findings. Second, our empirical strategy rests crucially on the differences between firms that were more or less heavily affected by the SM (or between workers employed at such firms). However, our measure of the SM burden at the firm correlates with the initial composition of employment at the firm (and possibly with other firm-specific unobservables) and one might wonder whether the effects that we find should be attributed more to the particular mix of workers employed at the firm in 1976 rather than to the SM system.

For brevity, we present robustness results only for a limited set of outcomes - only individual wage changes and wage dispersion within firms - and specifications - mostly linear effects of $\pi_{i(76)}$ - but in the Online Appendix we report all the detailed results.[35]

6.1 Sorting and selection

Our main results in Section 5.1 are produced using selected samples of individuals and firms. For example, when we look at individual wage changes (Table 4), we are forced to consider only workers who are present in our archives both at the beginning and at the end of the period, hence excluding both the new entrants and those leaving the database. Similarly, when we look at changes in wage dispersion within firm (Table 5) we are forced to consider only firms that are active both at the beginning and at the

[35] See Tables A3-A15 in the Online Appendix.

Table 11: *Wage Changes under the SM (1976-1982)*

	All Workers	Workers in firms operating in both 1976 and 1982	Workers employed in the same firms in 1976 and 1982
$\pi_{W_{i(76)}}$	-0.016***	-0.016***	-0.016***
	(0.000)	(0.000)	(0.000)
$\pi_{W_{i(76)}} \times SM_j$	-0.012***	-0.011***	-0.007***
	(0.000)	(0.000)	(0.000)
Observations	423,614	367,054	276,665

The dependent variable is the percentage difference of gross annual wages between 1976 and 1982.
SM_j is the firm share of workers receiving real pay raises from the SM (see Section 5.1 for details).
$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

end of the period, hence excluding firms that either began operating or closed down during the period.

Despite these inevitable constraints, the extraordinary richness of our data, in which we can see all the workers of any given firm, allows us to check the robustness of our findings on individual wages and within-firm dispersion by varying the criteria for selecting establishments in the first case and workers in the latter.

We start with Table 11, where in column 1 we report the same estimates as in Table 4 (Panel A, column 2) for comparison.[36] In this regression the dependent variable is the wage change between 1976 and 1982, hence by construction we select workers with valid wage observations in these two years; however, we have not imposed any selection criterion on firms. In column 2 we restrict the sample to workers who are employed in firms that are present in our archives both in 1976 and in 1982. The estimates are virtually identical to those in column 1, suggesting that our findings are robust to variations in the selection of firms. In column 3 we additionally limit the analysis to workers who are employed at the exact same firms in both 1976 and 1982 and we still find that higher paid workers receive lower wage increases, especially when employed at firms with high SM burdens, although the magnitude of this gradient is now lower.

[36]Our preferred specification includes firm fixed effects and we produce robustness results for this version of our models.

Table 12: *Wages within Firm (1976-1982)*

	All Firms			Firms with $>$ 15 employees		
	ΔStd.Dev	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$	ΔStd.Dev	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: all firm employees					
SM_j	-0.031***	0.017***	-0.047***	-0.068***	0.053***	-0.088***
	(0.003)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
Observations	33,134	33,134	33,134	5,572	5,572	5,572
	Panel B: only workers employed in both 1976 and 1982					
SM_j	-0.034***	0.019***	-0.051***	-0.066***	0.052***	-0.087***
	(0.003)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
Observations	29,788	29,788	29,788	5,562	5,562	5,562
	Panel C: only workers employed by the same firm in both 1976 and 1982					
SM_j	-0.036***	0.021***	-0.058***	-0.073***	0.062***	-0.093***
	(0.003)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
Observations	27,619	27,619	27,619	5,537	5,537	5,537

The dependent variables are the changes in three measures of the dispersion of wages within firms: (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6).
SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).
All specifications include the following firm controls: a constant, share of female workers, average age of workers and its square, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 12 we vary the selection of workers in our analysis of the changes in within-firm wage dispersion. For comparison, Panel A simply reports the same results of Table 5 (Panel A), where we select establishments that are present in our data both at the beginning and at the end of the period but we put no restrictions on workers. Panel B restricts the sample to workers observed in the archives both in 1976 and in 1982 (although not necessarily in the same firm). Finally, Panel C further restricts the sample to workers who are employed with the exact same employer in both 1976 and 1982. Results are very consistent across these various samples. In all cases we find that wages became more compressed within firms and that such compression was the result of both increasing low wages and, most importantly for us, decreasing high wages (compared to the median).

6.2 Falsification tests and alternative measure of SM

Throughout our analysis we have attributed the estimated effects on wage changes and within-firm wage compression to the introduction of the SM system. However, we have already discussed in Section 4 the concern that, given its correlation with the baseline structure of the workforce of the firm, our measure of the SM burden simply proxied for employment composition or other unobserved determinants of our outcomes.

The most natural way to address this issue would be a specification similar to a differences-in-differences where we compare the period of SM application with earlier years before the introduction of the system. Unfortunately, our data only start in 1975, hence the statistical power of this strategy is limited. We do however implement it and report results in Tables 13 and 14 but we also complement this approach with a similar comparison with later periods, when the SM was weakened.

Let us start with the comparison of individual wage changes in the pre-SM period (1975-1976) and the period when the SM was strongest (1976-1982). Since our main interest is an the differential effect of the SM across the distribution of initial wages, we implement a triple difference specification rather than a standard difference-in-difference. More specifically, we modify equation 6 adding one observation per individual for the pre-SM period, namely the percentage wage change between 1975 and 1976, and augmenting the controls with a full set of interactions with a dummy for the post-SM period (1976-1982).[37] The results are reported in Table 13 and are strongly supportive of our identification strategy.[38] Prior to the introduction of the SM high

[37] For the pre-SM period we define SM_j equal to the same value it has in the later period.

[38] Table 13 does not report any estimated effect of the dummy post-SM period *per se*. This is due to

Table 13: *Wage Changes – Difference-in-differences (1975-1982)*

	Full sample	$SM_j = 0$	$0 < SM_j < \overline{SM}$	$SM_j \geq \overline{SM}$
$\pi_{w_{i,t}}$	-0.004***	-0.005***	-0.004***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{w_{i,t}} \times SM_j$	0.001***	-	-	-
	(0.000)			
$\pi_{w_{i,t}} \times [Post = 1]$	-0.010***	-0.012***	-0.010***	-0.014***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{w_{i,t}} \times SM_j \times [Post = 1]$	-0.008***	-	-	-
	(0.000)			
Observations	929,862	71,786	589,151	268,925

[a] The dependent variable is the percentage difference of gross annual wages between 1975 and 1976 and between 1976 and 1982.
SM_j is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976.
$\pi_{w_{i,t}}$ is the percentile of the distribution of wages in year t (1975 or 1976).
$SM_j > 0$ is a dummy variable which takes the value 1 for firms with a positive SM burden.
$[Post = 1]$ is dummy equal to 1 for the observations following the introduction of the SM system, namely wages changes between 1976 and 1982.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects. All the explanatory variables and the firm fixed effects are interacted with the dummy for the post-SM period.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

wage workers employed in firms that were going to be hit harder by the system (i.e. firms with high SM_j) were actually enjoying larger (or less negative) wage changes than similar workers in other firms. This reverses completely in the post-SM period. Hence, it is implausible that the effects that we document in Table 4 are simply due to the specific baseline composition of employment at the firm (or other unobservable firm-specific distributional factors). In fact, in Table 13 we show that in those exact same firms the distribution of individual wage changes was very different only one year before the implementation of the SM mechanism.

Table 14 reports similar evidence for within-firm wage compression. In this case, we modify equation 7 adding one observation for each firm for the pre-SM period, namely indicators of changes in wage dispersion within each firm between 1975 and 1976. Furthermore, we augment the set of controls with full interactions with a post-

the fact that all the reported specifications include the interactions between the firm fixed-effects and the dummy post-SM period. Therefore, the dummy cannot be included among the regressors due to multicollinearity.

Table 14: *Wages within Firm – Difference-in-differences (1975-1982)*

	All Firms			Firms with > 15 employees		
	ΔStd.Dev	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$	ΔStd.Dev	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$
	(1)	(2)	(3)	(4)	(5)	(6)
SM_j	0.023***	-0.018***	0.024***	0.012**	-0.012**	0.012*
	(0.003)	(0.002)	(0.003)	(0.006)	(0.005)	(0.007)
$SM_j \times [Post = 1]$	-0.054***	0.036***	-0.072***	-0.068***	0.065***	-0.085***
	(0.003)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
$[Post = 1]$	-0.021***	0.013***	-0.005**	-0.024***	0.015***	-0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Observations	68,826	68,826	68,826	11,810	11,810	11,810

The dependent variables are the changes in three measures of the dispersion of wages within firms over two periods (1975-1976 and (1976-1982): (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6).
SM_j is the firm share of workers expecting to receive real pay raises from the SM (see Section 5.1 for details).
All specifications include the following firm controls, fully interacted with the dummy for the post SM period: a constant, share of female workers, average age of workers and its square, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

SM dummy, leading to a standard differences-in-differences specification. Results clearly show that prior to the SM wages were becoming more dispersed within firms with high SM_j, both in the lower and in the upper part of the distribution. When the SM was introduced this dynamics completely reverses: wages became more compressed where the SM hit hardest (i.e. firms with high SM_j) and this occurred because both low and high wages moved closer to the firm median.

One problem with the differences-in-differences approach of Tables 13 and 14 is that the pre-SM period is very short, only one year. Hence, we complement the results with further evidence from later periods, when the SM was weakened. If one thinks that our main findings are due to some unobservable firm-specific factors that simply correlate with SM_j, then one should expect the effects that we detect to persist even when the SM disappeared; if instead SM_j truly picks up the effect of the SM system, we should observe lower or no correlation with outcomes measured in later periods when the SM was much weaker.[39]

For this exercise, we consider the same firms that we use for our main estimates (Tables 4, 5, 6) and we investigate whether the wages paid to their workers correlate

[39]Of course, the effects of employment composition could also themselves change over time but it would still be worrisome to find that the SM burden measured in 1976 correlates significantly with later outcomes.

with their initial SM burden (in 1976) also in the periods 1983-1985, when the SM system was first weakened; and 1986-1992, when its compressing power was almost completely eliminated (see Section 3).

We do not go beyond 1992 for two reasons: (i) first, when the SM was finally abolished in 1992 many other changes in the system of industrial relations were introduced and (ii), as we move away from 1976, more and more firms disappear from our data and the comparison with our main findings becomes more and more difficult.[40]

The results of this validation exercise are reported in Panels B and C of Table 15 and Table 16 for the wage changes and the within-firm dispersion, respectively.[41] For robustness, Panels A of these tables reports our benchmark results from Table 4 (Panel A) and Table 5 (Panel A).

For the first outcome (wage changes) we still find that better paid workers enjoy lower wage increases, both in 1983-1985 and in 1986-1992. However, the gradient of this differential vary only very little with the magnitude of the burden imposed by the SM system on the firm. The coefficient on the interaction between $\pi_{W_{i(76)}}$ and SM_j is -0.012 in our benchmark period 1976-1982 and it drops to approximately zero in both subsequent periods (1983-1985 and 1986-1992). Moreover, there does not seem to be any significant difference in the coefficient of $\pi_{W_{i(76)}}$ across firms with different SM burdens. Furthermore, in Table 16 we find that in the periods after 1982 the changes in the within-firm distribution of wages appear to be unrelated to the firm burden of the SM, contrary to what we find for the strongest period of application of the SM system.

These results offer strong support to the causal interpretation of our main findings. If the effects that we document in Sections 5.1 and 5.2 were not driven by the SM but rather by some other unobservable firm and distribution specific factors one would reasonably expect to detect similar effects also once the SM disappears. Tables 15 and 16, show that this is not the case.

The last piece of evidence we present in this section is a replication of our main findings using an alternative measure of the SM burden of the firm. Such an alternative indicator, which we label SM_{2j}, takes into account the entire distribution of the SM real wage adjustments due by the firm. We construct it by considering all the workers employed at the firm in 1976 and computing the sum of all the real SM adjustments that were due by the employer in 1977. We then express this sum as a fraction of the

[40] We already lose 22.4% of firms between 1976 and 1983 and another 23.8% by 1986.

[41] Additional results for the periods 1983-1985 and 1986-1992 are shown in Tables A3-A10 in the Online Appendix.

Table 15: *Wage Changes under the SM – Robustness*

	Full sample	SM burden:[a]		
		low	medium	high
	Panel A: Benchmark Analysis, 1976–1982			
$\pi_{W_{i(76)}}$	-0.016***	-0.017***	-0.017***	-0.025***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{W_{i(76)}} \times SM_j$	-0.012***	–	–	–
	(0.000)			
Observations	423,614	32,594	323,275	66,745
	Panel B: Results for the Period 1983–1985			
$\pi_{W_{i(83)}}$	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{W_{i(83)}} \times SM_j$	-0.000***	–	–	–
	(0.000)			
Observations	426,099	35,633	319,235	71,231
	Panel C: Results for the Period 1986–1992			
$\pi_{W_{i(86)}}$	-0.004***	-0.005***	-0.004***	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{W_{i(86)}} \times SM_j$	-0.002***	–	–	–
	(0.000)			
Observations	297,894	26,924	220,601	50,369
	Panel D: Alternative Measure of SM Burden, 1976–1982[d]			
$\pi_{W_{i(76)}}$	-0.019***	-0.018***	-0.016***	-0.021***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi_{W_{i(76)}} \times SM_j$	-0.046***	–	–	–
	(0.002)			
Observations	423,614	145,461	136,950	141,203

[a] In Panel D the 3 groups are defined as the bottom third, middle third and top third of the (firm) distribution of SM_{2j}. In all other panels the 3 groups are defined as $SM_j = 0$ (low), $0 < SM_j \leq \overline{SM}$ (middle) and $SM_j > \overline{SM}$ (high).
The dependent variable is the percentage difference of gross annual wages between 1982 and 1976 (Panels A and D); between 1985 and 1983 (Panel B); and between 1992 and 1986 (Panel C).
$\pi_{W_{i(k)}}$ is the percentile of the distribution of wages in year k.
In Panels A, B and C SM_j is the firm share of 1976 employees expecting to receive real pay raises from the SM (see Section 5.1 for details). In Panel D SM_{2j} is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976 (see Section 6 for details).
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects. (see Section 6 for details)
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 16: *Wages within Firm – Robustness*

	All Firms			Firms with $>$ 15 employees		
	ΔStd.Dev.	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$	ΔStd.Dev.	$\Delta\pi_{25/50}$	$\Delta\pi_{75/50}$
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Benchmark Analysis, 1976–1982					
SM_j	-0.031***	0.017***	-0.047***	-0.068***	0.053***	-0.088***
	(0.003)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
Observations	33,134	33,134	33,134	5,572	5,572	5,572
	Panel B: Results for the Period 1983–1985					
SM_j	0.003	-0.003	0.004	0.003	-0.008	-0.006
	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)	(0.006)
Observations	25,679	25,679	25,679	5,627	5,627	5,627
	Panel C: Results for the Period 1986–1992					
SM_j	0.001	-0.001	0.009**	-0.012*	0.003	-0.003
	(0.004)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
Observations	17,796	17,796	17,796	4,769	4,769	4,769
	Panel D: Alternative Measure of SM Burden, 1976–1982					
$SMBurden_j$	-0.124***	0.018	-0.246***	-0.085**	-0.008	-0.164***
	(0.020)	(0.017)	(0.023)	(0.035)	(0.030)	(0.039)
Observations	33,134	33,134	33,134	5,572	5,572	5,572

The dependent variables are the changes in three measures of the dispersion of wages within firms: (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6). In Panels A and D the changes are taken over the period 1976-1982, in Panel B over 1983-1985 and in Panel C over 1986-1992.
In Panels A, B and C SM_j is the firm share of 1976 employees receiving real pay raises from the SM (see Section 5.1 for details). In Panel D SM_{2j} is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976 (see Section 6 for details).
All specifications include the following firm controls: average workers' age (and squared), proportion of female workers, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers. The results are estimated with OLS. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

total wage bill in 1976:

$$SM_{2j} = \frac{\sum_{i \in j} \left[\frac{W_{i(76)} + s\Delta P_{76-77}}{P_{77}/P_{76}} - W_{i(76)} \right]}{\sum_{i \in j} W_{i(76)}} \tag{8}$$

where j is the firm where worker i was employed in 1976 and $\frac{W_{i(76)} + s\Delta P_{76-77}}{P_{77}/P_{76}}$ is the wage (at 1976 prices) that i would have received in 1977 by the mechanical application of the SM wage adjustment. The numerator of equation 8 is the sum at the firm level of all the absolute real SM adjustments due by the firm in 1977 to its 1976 employees; the denominator is the firm's total wage bill in 1976.

The correlation of this new indicator with our benchmark measure SM_j is equal to 0.77 (and statistically significant), which is large but still sufficiently far from 1 to allow exploiting the differences between these two variables. What is important for our analysis is that SM_j and SM_{2j} are sufficiently different to covary in rather distinct ways with a number of other firm characteristics. For example, the correlation between the share of white collar employees and SM_j is -0.063 and -0.080 with SM_{2j}; the correlation between firm size and SM_j is -0.086 and -0.102 with SM_{2j}.[42]

Panels D of Tables 15 and 16 replicate our benchmark results from Tables 4 and 5 replacing SM_j with SM_{2j} and results are qualitatively the same.[43] This evidence further confirms that our results are unlikely to reflect the effect of other firm-specific characteristics but can be reasonably attributed to the SM system.

7 Conclusions

In this paper we study a unique wage indexation mechanism that was adopted in Italy in the late 1970s and early 1980s, the *Scala Mobile* (SM). Because of the way it was designed, the SM induced large real wage rises to workers at the bottom of the wage distribution.

To study how such a mechanism affected the process of within-firm rent sharing, we first develop a simple model with intra-firm bargaining and on-the-job search. In the model the wages of unskilled workers are set exogenously whereas those of the skilled workers are negotiated. Given the complementarity of skill types in the production process, an increase in the exogenous wage rate of the unskilled reduces

[42] Table A11 in the Online Appendix reports such correlations.

[43] Additional results using our alternative measure of SM burden are available in Tables A12-A15 in the Online Appendix.

the rent over which the firm bargains with their skilled colleagues.

We document that, as predicted by our model, the system generated important spillover effects on high-wage workers who experienced lower wage growth as their low-wage colleagues were given larger mandatory SM adjustments. This effect was stronger for skilled workers employed at establishments with larger shares of unskilled workers, suggesting that the spillover effect was generated by a mechanism of rent-sharing within the firm. We also show that part of the adjustment to the SM took place through job turnover: high mandatory wage rises for the unskilled induced skilled workers to move towards the most skill-intensive firms and away from the least skill-intensive ones, which were eventually more likely to exit the market.

Overall, our analysis showed that an important channel through which labour market institutions affect the overall distribution of wages operates within the boundaries of the firm. This is an important result because the large literature on labour market institutions and inequality has focused almost exclusively on the lower end of the distribution and has largely disregarded the dynamics of wages within firms. Revisiting the role of these institutions in the light of their impact within the firm might contribute to explaining the evolution of inequality also among high-wage earners.

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Online Appendix for the paper

"Wage compression within the firm: evidence from an indexation scheme"

by

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Not for publication

Table A1: Balancing of observable characteristics

	$SM_j = 0$		$0 < SM_j \leq \overline{SM}$		$SM_j > \overline{SM}$	
	mean	(std.dev.)	mean	(std.dev.)	mean	(std.dev.)
			Panel A: All workers			
Female	0.131	(0.338)	0.232	(0.422)	0.399	(0.490)
Age	34.15	(9.949)	33.339	(10.199)	29.713	(10.498)
White collar	0.176	(0.381)	0.144	(0.351)	0.094	(0.292)
Log wage	15.191	(0.223)	15.178	(0.234)	14.856	(0.260)
Firm size[a]	51.282	(140.61)	603.82	(1,260.0)	66.766	(189.00)
Old firm[b]	0.892	(0.311)	0.95	(0.219)	0.892	(0.310)
Share of white collars	0.188	(0.302)	0.166	(0.188)	0.096	(0.188)
Agriculture[c]	0.204	(0.403)	0.092	(0.289)	0.136	(0.343)
Manufacturing[c]	0.397	(0.489)	0.72	(0.449)	0.675	(0.468)
Services[c]	0.399	(0.490)	0.188	(0.390)	0.189	(0.391)
			Panel B: Quintile 1			
Female			0.53	(0.499)	0.503	(0.500)
Age			28.127	(10.505)	28.196	(10.626)
White collars			0.147	(0.354)	0.094	(0.291)
Wage in 1976			14.642	(0.172)	14.606	(0.196)
Firm size[a]			813.51	(1,633.2)	44.641	(142.72)
Old firm[b]			0.937	(0.242)	0.866	(0.341)
Share of white collars			0.178	(0.213)	0.096	(0.217)
Agriculture[c]			0.111	(0.314)	0.13	(0.337)
Manufacturing[c]			0.661	(0.473)	0.648	(0.478)
Services[c]			0.228	(0.420)	0.222	(0.415)
			Panel C: Quintile 3			
Female	0.161	(0.367)	0.281	(0.450)	0.265	(0.441)
Age	33.797	(10.245)	32.542	(10.682)	31.57	(10.161)
White collars	0.155	(0.362)	0.076	(0.265)	0.103	(0.303)
Wage in 1976	15.049	(0.036)	15.053	(0.036)	15.041	(0.036)
Firm size[a]	9.42	(23.136)	449.92	(1,152.6)	75.149	(205.91)
Old firm[b]	0.883	(0.321)	0.944	(0.229)	0.913	(0.282)
Share of white collars	0.163	(0.304)	0.133	(0.163)	0.106	(0.175)
Agriculture[c]	0.285	(0.451)	0.122	(0.327)	0.155	(0.361)
Manufacturing[c]	0.334	(0.472)	0.74	(0.439)	0.645	(0.479)
Services[c]	0.382	(0.486)	0.138	(0.345)	0.201	(0.401)
			Panel D: Quintile 5			
Female	0.1	(0.299)	0.109	(0.312)	0.162	(0.369)
Age	35.334	(9.057)	35.721	(8.709)	34.984	(9.007)
White collars	0.276	(0.447)	0.281	(0.449)	0.316	(0.465)
Wage in 1976	15.491	(0.142)	15.477	(0.138)	15.446	(0.126)
Firm size[a]	141.00	(231.10)	806.53	(1,277.0)	169.65	(410.29)
Old firm[b]	0.919	(0.272)	0.962	(0.191)	0.91	(0.287)
Share of white collars	0.284	(0.335)	0.223	(0.219)	0.167	(0.227)
Agriculture[c]	0.098	(0.298)	0.051	(0.219)	0.101	(0.301)
Manufacturing[c]	0.402	(0.490)	0.666	(0.472)	0.649	(0.477)
Services[c]	0.499	(0.500)	0.284	(0.451)	0.251	(0.434)

[a] Number of full-time employees.

[b] Dummy variable for firms established before 1974.

[c] Dummies for industrial sector.

All values calculated in the year 1976. Source: INPS Social Security Archives, 1976-1982.

Table A2: Wage changes under the SM (1976-1982) using quartiles of SM

		$SM > 0$			
	$SM = 0$	1^{st} quartile	2^{nd} quartile	3^{rd} quartile	4^{th} quartile
$\pi_{w_{i,y}}$	-0.017***	-0.017***	-0.017***	-0.017***	-0.022***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
1^{st} quintile[a]	–	1.269***	1.179***	0.956***	0.922***
		(0.015)	(0.009)	(0.007)	(0.009)
2^{nd} quintile[a]	0.237***	0.318***	0.274***	0.228***	0.286***
	(0.012)	(0.008)	(0.005)	(0.005)	(0.009)
4^{th} quintile[a]	-0.234***	-0.209***	-0.192***	-0.191***	-0.237***
	(0.010)	(0.005)	(0.004)	(0.006)	(0.012)
5^{th} quintile[a]	-0.556***	-0.460***	-0.450***	-0.419***	-0.510***
	(0.012)	(0.005)	(0.006)	(0.007)	(0.016)
Observations	33,594	97,506	97,963	97,046	97,505

[a] Quintile of the distribution of wages in 1976.

The dependent variable is the percentage difference of gross annual wages between 1976 and 1982.

SM_j is the firm share of workers receiving real pay raises from the SM (see Section 7.2 for details).

$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.

All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.

Each column in each panel is a separate regression.

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results for periods 1983–1985 and 1986–1992

Table A3: Wage changes under the SM (1983-1985)

	Full sample	$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
			Panel A	
$\pi w_{i(83)}$	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi w_{i(83)} \times SM_j$	-0.000***	–	–	–
	(0.000)			
			Panel B	
1^{st} quintile[a]	0.176***	0.171***	0.185***	0.151***
	(0.001)	(0.004)	(0.001)	(0.002)
2^{nd} quintile[a]	0.050***	0.058***	0.051***	0.037***
	(0.001)	(0.003)	(0.001)	(0.002)
4^{th} quintile[a]	-0.030***	-0.040***	-0.030***	-0.023***
	(0.001)	(0.003)	(0.001)	(0.003)
5^{th} quintile[a]	-0.065***	-0.088***	-0.064***	-0.047***
	(0.001)	(0.003)	(0.001)	(0.004)
Observations	426,099	35,633	319,235	71,231

[a] Quintile of the distribution of wages in 1983.
The dependent variable is the percentage difference of gross annual wages between 1983 and 1985.
SM_j is the firm share of workers receiving real pay raises from the SM.
$\pi_{W_{i(83)}}$ is the percentile of the distribution of wages in 1983.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1983. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Wage changes under the SM (1986-1992)

	Full sample	$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
			Panel A	
$\pi w_{i(86)}$	-0.004***	-0.005***	-0.004***	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi w_{i(86)} \times SM_j$	-0.002***	–	–	–
	(0.000)			
			Panel B	
1^{st} quintile[a]	0.284***	0.299***	0.297***	0.248***
	(0.003)	(0.011)	(0.003)	(0.006)
2^{nd} quintile[a]	0.070***	0.078***	0.067***	0.065***
	(0.002)	(0.008)	(0.002)	(0.005)
4^{th} quintile[a]	-0.040***	-0.072***	-0.037***	-0.041***
	(0.002)	(0.007)	(0.002)	(0.006)
5^{th} quintile[a]	-0.078***	-0.140***	-0.069***	-0.095***
	(0.002)	(0.008)	(0.002)	(0.009)
Observations	297,894	26,924	220,601	50,369

[a] Quintile of the distribution of wages in 1986.
The dependent variable is the percentage difference of gross annual wages between 1986 and 1992.
SM_j is the firm share of workers receiving real pay raises from the SM.
$\pi_{W_{i(86)}}$ is the percentile of the distribution of wages in 1986.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1986. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5: Wages within firm (1983-1985)

	All Firms			Firms with > 15 employees		
	ΔStd.Dev 85-83	$\Delta\pi_{25/50}$ 85-83	$\Delta\pi_{75/50}$ 85-83	ΔStd.Dev 85-83	$\Delta\pi_{25/50}$ 85-83	$\Delta\pi_{75/50}$ 85-83
			Panel A			
SM_j	0.003	-0.003	0.004	0.003	-0.008	-0.006
	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)	(0.006)
			Panel B			
$SM_j = 0$	0.131***	-0.108***	-0.006	0.169***	-0.106***	-0.041
	(0.015)	(0.014)	(0.017)	(0.032)	(0.027)	(0.033)
$0 < SM_j < \overline{SM}$	0.126***	-0.105***	-0.002	0.161***	-0.099***	-0.043
	(0.015)	(0.014)	(0.017)	(0.032)	(0.027)	(0.034)
$SM_j \geq \overline{SM}$	0.130***	-0.108***	0.001	0.163***	-0.101***	-0.044
	(0.015)	(0.014)	(0.016)	(0.031)	(0.026)	(0.032)
Observations	25,679	25,679	25,679	5,627	5,627	5,627

The dependent variables are the changes in three measures of the dispersion of wages within firms: (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6).
SM_j is the firm share of workers expecting to receive real pay raises from the SM.
All specifications include the following firm controls: a constant, share of female workers, average age of workers and its square, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Wages within firm (1986-1992)

	All Firms			Firms with > 15 employees		
	ΔStd.Dev 92-86	$\Delta\pi_{25/50}$ 92-86	$\Delta\pi_{75/50}$ 92-86	ΔStd.Dev 92-86	$\Delta\pi_{25/50}$ 92-86	$\Delta\pi_{75/50}$ 92-86
			Panel A			
SM_j	0.001	-0.001	0.009**	-0.012*	0.003	-0.003
	(0.004)	(0.003)	(0.004)	(0.007)	(0.006)	(0.008)
			Panel B			
$SM_j = 0$	-0.184***	0.198***	-0.210***	-0.197***	0.343***	-0.123**
	(0.022)	(0.021)	(0.025)	(0.043)	(0.038)	(0.050)
$0 < SM_j < \overline{SM}$	-0.188***	0.199***	-0.213***	-0.196***	0.332***	-0.132***
	(0.022)	(0.021)	(0.026)	(0.043)	(0.039)	(0.050)
$SM_j \geq \overline{SM}$	-0.184***	0.197***	-0.203***	-0.200***	0.337***	-0.130***
	(0.022)	(0.020)	(0.025)	(0.042)	(0.037)	(0.049)
Observations	17,796	17,796	17,796	4,769	4,769	4,769

The dependent variables are the changes in three measures of the dispersion of wages within firms: (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6).
SM_j is the firm share of workers expecting to receive real pay raises from the SM.
All specifications include the following firm controls: a constant, share of female workers, average age of workers and its square, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7: Probability of changing employer (1983-1985)

	Full sample	$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
		Panel A		
$\pi_{W_{i(83)}}$	-0.057***	-0.044***	-0.056***	-0.061***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi w_{i(83)} \times SM_j$	0.000	–	–	–
	(0.000)			
		Panel B		
1^{st} quintile[a]	3.929***	3.936***	4.155***	3.419***
	(0.002)	(0.008)	(0.002)	(0.004)
2^{nd} quintile[a]	1.346***	1.451**	1.320***	1.252***
	(0.001)	(0.006)	(0.001)	(0.004)
4^{th} quintile[a]	-0.531***	0.328	-0.610***	-0.261
	(0.001)	(0.005)	(0.001)	(0.005)
5^{th} quintile[a]	-0.556***	0.327	-0.603***	-0.468
	(0.001)	(0.006)	(0.002)	(0.007)
Observations	426099	35633	319235	71231

[a] Quintile of the distribution of wages in 1983.
The dependent variable is a dummy equal to one for workers who changed employer at least once between 1983 and 1985.
SM_j is the firm share of workers expecting to receive real pay raises from the SM.
$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1983.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
All coefficients have been multiplied by 100 for readability. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Probability of changing employer (1986-1992)

	Full sample	$SM_j = 0$	$0 < SM_j \leq \overline{SM}$	$SM_j > \overline{SM}$
		Panel A		
$\pi_{W_{i(86)}}$	-0.128***	-0.149***	-0.127***	-0.127***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi w_{i(86)} \times SM_j$	0.000	–	–	–
	(0.000)			
		Panel B		
1^{st} quintile[a]	6.833***	7.240***	7.002***	6.022***
	(0.003)	(0.012)	(0.003)	(0.007)
2^{nd} quintile[a]	2.744***	4.452***	2.896***	1.645***
	(0.002)	(0.009)	(0.003)	(0.006)
4^{th} quintile[a]	-2.693***	-4.003***	-2.669***	-1.273
	(0.002)	(0.008)	(0.002)	(0.008)
5^{th} quintile[a]	-2.650***	-4.274***	-2.504***	-2.903***
	(0.003)	(0.009)	(0.003)	(0.011)
Observations	297894	26924	220601	50369

[a] Quintile of the distribution of wages in 1986.
The dependent variable is a dummy equal to one for workers who changed employer at least once between 1986 and 1992.
SM_j is the firm share of workers expecting to receive real pay raises from the SM.
$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1986.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
All coefficients have been multiplied by 100 for readability. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Probability of firm exit (1983-1985)

Dependent var.= prob. of firm exit[a]	All Firm	Firms with more than 15 employees
	Panel A	
SM_j	0.010*	-0.002
	(0.006)	(0.020)
	Panel B	
$SM_j = 0$	0.404***	0.147
	(0.027)	(0.110)
$0 < SM_j < \overline{SM}$	0.394***	0.136
	(0.028)	(0.110)
$SM_j \geq \overline{SM}$	0.404***	0.136
	(0.027)	(0.107)
Observations	34,620	5,875

[a] The dependent variable is a dummy equal to one for firms which ceased operating at some point between 1983 and 1985. The sample includes all firms that were operating in Veneto in 1983.
SM_j is the firm share of workers expecting to receive real pay raises from the SM.
All specifications include the following firm controls: average workers' age (and squared), proportion of female workers, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers. The results are estimated with OLS.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Probability of firm exit (1986-1992)

Dependent var.= prob. of firm exit[a]	All Firm	Firms with more than 15 employees
	Panel A	
SM_j	0.035***	0.058**
	(0.008)	(0.027)
	Panel B	
$SM_j = 0$	0.819***	0.173
	(0.038)	(0.169)
$0 < SM_j < \overline{SM}$	0.787***	0.194
	(0.039)	(0.170)
$SM_j \geq \overline{SM}$	0.829***	0.225
	(0.037)	(0.165)
Observations	28,585	5,407

[a] The dependent variable is a dummy equal to one for firms which ceased operating at some point between 1986 and 1992. The sample includes all firms that were operating in Veneto in 1986.
SM_j is the firm share of workers expecting to receive real pay raises from the SM.
All specifications include the following firm controls: average workers' age (and squared), proportion of female workers, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers. The results are estimated with OLS.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results using alternative measures of SM burden

Table A11: Correlations table

	SM_j	SM_{2j}
SM_j	1.000	0.777
		(0.000)
Number of full-time employees	-0.086	-0.102
	(0.000)	(0.000)
1=Firm established before 1974	-0.058	-0.053
	(0.000)	(0.000)
Share of white collars	-0.080	-0.063
	(0.000)	(0.000)
1=agriculture	-0.082	-0.079
	(0.000)	(0.000)
1=manufacturing	0.153	0.087
	(0.000)	(0.000)
1=services	-0.092	-0.026
	(0.000)	(0.000)

All values calculated in the year 1976. Source: INPS Social Security Archives, 1976-1982.

Table A12: Wage changes under the SM (1976-1982)

	Full sample	Bottom tercile of SM_{2j}	Middle tercile of SM_{2j}	Top tercile of SM_{2j}
		Panel A		
$\pi w_{i(76)}$	-0.019***	-0.018***	-0.016***	-0.021***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi w_{i(76)} \times SM_{2j}$	-0.046***	–	–	–
	(0.002)			
		Panel B		
1^{st} quintile[a]	0.967***	1.040***	1.028***	0.933***
	(0.004)	(0.009)	(0.007)	(0.007)
2^{nd} quintile[a]	0.264***	0.348***	0.262***	0.250***
	(0.003)	(0.007)	(0.005)	(0.006)
4^{th} quintile[a]	-0.204***	-0.225***	-0.180***	-0.213***
	(0.003)	(0.004)	(0.004)	(0.009)
5^{th} quintile[a]	-0.466***	-0.482***	-0.397***	-0.450***
	(0.003)	(0.005)	(0.005)	(0.014)
Observations	423,614	145,461	136,950	141,203

[a] Quintile of the distribution of wages in 1976.
The dependent variable is the percentage difference of gross annual wages between 1976 and 1982.
SM_{2j} is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976.
$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A13: Wages within firm (1976-1982)

	All Firms			Firms with > 15 employees		
	ΔStd.Dev 82-76	$\Delta\pi_{25/50}$ 82-76	$\Delta\pi_{75/50}$ 82-76	ΔStd.Dev 82-76	$\Delta\pi_{25/50}$ 82-76	$\Delta\pi_{75/50}$ 82-76
			Panel A			
SM_{2j}	-0.124***	0.018	-0.246***	-0.085**	-0.008	-0.164***
	(0.020)	(0.017)	(0.023)	(0.035)	(0.030)	(0.039)
			Panel B			
Bottom tercile of SM_{2j}	-0.073***	0.050***	-0.200***	-0.137***	0.278***	-0.273***
	(0.015)	(0.013)	(0.018)	(0.036)	(0.031)	(0.040)
Middle tercile of SM_{2j}	-0.049***	0.034***	-0.171***	-0.122***	0.263***	-0.250***
	(0.014)	(0.012)	(0.016)	(0.036)	(0.031)	(0.040)
Top tercile of SM_{2j}	-0.069***	0.049***	-0.188***	-0.136***	0.276***	-0.264***
	(0.014)	(0.011)	(0.016)	(0.035)	(0.030)	(0.039)
Observations	33,134	33,134	33,134	5,572	5,572	5,572

The dependent variables are the changes in three measures of the dispersion of wages within firms: (i) the std. deviation of log wages (columns 1 and 4); (ii) the ratio of the 25th and 50th percentile (columns 2 and 5); (iii) the ratio between the 50th and 75th percentile (columns 3 and 6).
SM_{2j} is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976.
All specifications include the following firm controls: a constant, share of female workers, average age of workers and its square, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers.
Each column in each panel is a separate regression.
Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14: Probability of changing employer

	Full sample	Bottom tercile of SM_{2j}	Middle tercile of SM_{2j}	Top tercile of SM_{2j}
		Panel A		
$\pi_{W_{i(76)}}$	-0.145***	-0.107***	-0.178***	-0.169***
	(0.000)	(0.000)	(0.000)	(0.000)
$\pi w_{i(76)} \times SM_{2j}$	0.178***	–	–	–
	(0.001)			
		Panel B		
1^{st} quintile[a]	8.229***	4.978***	10.455***	9.022***
	(0.003)	(0.006)	(0.005)	(0.004)
2^{nd} quintile[a]	2.821***	3.720***	3.295***	3.094***
	(0.002)	(0.004)	(0.003)	(0.003)
4^{th} quintile[a]	-2.741***	-2.657***	-3.110***	-0.834*
	(0.002)	(0.003)	(0.003)	(0.005)
5^{th} quintile[a]	-3.453***	-3.040***	-3.640***	-0.081
	(0.002)	(0.003)	(0.004)	(0.008)
Observations	423,614	32,594	323,275	66,745

[a] Quintile of the distribution of wages in 1976.
The dependent variable is a dummy equal to one for workers who changed employer at least once between 1976 and 1982.
SM_{2j} is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976.
$\pi_{W_{i(76)}}$ is the percentile of the distribution of wages in 1976.
All specifications include a constant, age, age squared, a gender dummy, a dummy for blue-collar workers, and the share of firms that closed down during 1976. Results are estimated with firm fixed effects.
Each column in each panel is a separate regression.
All coefficients have been multiplied by 100 for readability. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A15: Probability of firm exit

Dependent var.= prob. of firm exit[a]	All Firm	Firms with more than 15 employees
	Panel A	
SM_{2j}	0.357***	0.108
	(0.027)	(0.126)
	Panel B	
Bottom tercile of SM_{2j}	0.547***	0.341***
	(0.023)	(0.125)
Middle tercile of SM_{2j}	0.533***	0.371***
	(0.021)	(0.123)
Top tercile of SM_{2j}	0.565***	0.394***
	(0.020)	(0.121)
Observations	67,733	6,515

[a] The dependent variable is a dummy equal to one for firms which ceased operating at some point between 1976 and 1982. The sample includes all firms that were operating in Veneto in 1976.
SM_{2j} is sum of all real SM adjustments due by the firm in 1977 over the firm's wage bill in 1976.
All specifications include the following firm controls: average workers' age (and squared), proportion of female workers, size, size squared, a dummy for firms established before 1974, three sector dummies and the share of white collar workers. The results are estimated with OLS.