

Wage compression and self-employment:  
evidence from the abolition of the Scala Mobile in  
Italy \*

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## Abstract

In this paper we explore the relationship between wage compression and self-employment using a unique matched employer-employee dataset that contains information on the universe of workers and firms in two provinces of the North-East of Italy between 1975 and 1997. During this particular period the wage distribution was strongly compressed by an automatic wage indexation scheme, the so-called *Scala Mobile*, that was gradually abolished over the years. This system, as well as the policy changes that led to its abolition, generate exogenous variation in the degree of wage compression at the individual level. Thanks to the richness of our data, we are able to exploit this variation to identify the effect of wage compression on the transition probability from dependent to self-employment at different points of the distribution and controlling for possible additional negotiated wage changes. Our results indicate that indeed the best paid employees reacted to the real wage cuts induced by the *Scala Mobile* by transiting earlier and more often to self-employment. The opposite effect is found at the bottom of the wage distribution.

## 1 Introduction and motivation

The literature that explores the decision to become an entrepreneur has focused almost exclusively on institutional factors that affects the returns to self-employment, like start-up costs, taxes and financial market development (Blanchflower and Oswald [1998], Blau [1987], Bruce [2000], Carrasco [1999], Torrini [2005]). Much less attention has been paid to the returns from dependent employment - the single most important alternative to self-employment - despite the profound changes in the wage distributions that occurred in almost all industrialized countries in the recent past.

In fact, the evolution of wage inequality has been one of the most important and most studied labour market developments of the past two decades (DiNardo et al. [1996], Gottschalk et al.[1994], Juhn et al. [1993], Katz et al. [1999], Fortin and Lemieux [1997], Card [1996]). Particulary, the work of DiNardo et al. [1996], Fortin and Lemieux [1997], Card [1996], Manacorda [2004], just to mention a few, emphasized the

role of labour market institutions as important elements in explaining these developments. Minimum wages, unions, wage setting arrangements (indexation mechanisms, performance-pay, et.) are all factors that have proven to have notable effects on the distribution of wages and many of them have been subject to important policy changes in the past decades.

To the extent that these labour market institutions drive a wedge between wages and productivity they must also affect the relative returns to self-employment where earnings are more directly related to productivity. This paper focuses on the relationship between wage compression and self-employment. The first and most obvious reason to believe that the decision to become a self-entrepreneur depends on the distribution of wages paid to dependent employees is related to future career prospects. If, for example, the distribution of wages is compressed towards the mean, the most able workers, who would otherwise experience a steep wage progression with seniority, cannot expect very high future wage increases and would therefore be more prone to undertake the risk and pay the transition costs associated with becoming a self employed. At the bottom of the skills distribution the effect is less obvious. On the one hand, workers who earn low wages expect higher wage increases when the distribution is more compressed towards the mean. However, some, if not all, wage compressing institutions like minimum wages, unions, indexation mechanisms, may actually reduce job creation especially at the bottom of the distribution and some unskilled workers might find it harder to obtain a job in the first place and opt for low productivity self-employment activities.

The degree of wage compression should also influence the average quality of new enterprisers with potentially important consequences on overall employment and productivity of the economy. This is an issue that our data allow to explore and it is left for future research.

In this paper we explore the relationship between self-employment and wage dispersion using a unique matched employer-employee dataset that contains information on the universe of workers and firms in two provinces of the North-East of Italy between 1975 and 1997.<sup>1</sup> This dataset offers an ideal setting for our purposes for two important reasons. First, the incidence of self-employment in this area of Italy has traditionally been very high.<sup>2</sup> Second, during the period covered by the sample a pervasive wage indexation mechanism - the so-called Scala Mobile - has been gradually abandoned generating a large exogenous variation in wage dispersion (see Manacorda [2004]).<sup>3</sup>

The Scala Mobile was an automatic indexation mechanism that offered all workers the same absolute wage increase for each point change in the price index and, as documented by Manacorda [2004], it played a major role in compressing the distribution of wages in Italy until the mid-1980's, when it was gradually abolished (the key policy changes occurring in 1983, 1986 and 1991). Manacorda [2004] also documents that the abolition of the Scala Mobile led to a resumption of wage inequality starting in the late 1980's.

One drawback of our data is the fact that only workers who have worked (and paid social security contributions) at least one day as dependent employees in the two provinces and during the years covered by the sample appear in the dataset. As a consequence, our analysis does not consider workers who start their working life directly as self-employed, an instance that is, however, very rare.

Simply exploiting the changes in the Scala Mobile to identify the role of wage compression on transitions to self-employment would not be completely satisfactory because, through bilateral negotiations employers and employees could undo (at least

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<sup>1</sup>See section 4 for additional details about the data

<sup>2</sup>ADD DATA

<sup>3</sup>A more detailed description of the Scala Mobile will be provided in the next section.

partly) the effects of the wage indexation mechanism. Fortunately, combining our data with the exact rules of the Scala Mobile (and how they changed over time) it is possible to compute expected wage changes for each single worker and to control for additional negotiated wage changes.

The identification of the effect of automatic wage changes exploits variation within employer-employee matches generated both by the various policy changes that led to the abolition of the Scala Mobile and by time variation in inflation rates (which was considerable in the period considered). Controlling for the effect of negotiated wage changes is more complex. In fact, while the Scala Mobile payments are mandatory by the law and are therefore independent of individual productivity, negotiated wage changes are likely to be correlated with the unobservable worker's productivity, a factor that also affects the transition probability to self-employment, thus inducing a potentially serious endogeneity problem.

A unique feature of our data is the possibility to observe all workers in any given firm. We will make use of this fact to construct an instrumental variable for negotiated wage changes. In fact, the ability of firms to undo the effects of the Scala Mobile through negotiated wage changes is correlated with the total amount of automatic wage increases that must compulsorily be paid to its employees. However, since negotiated changes cannot be observed for workers who move to self-employment, we will estimate a reduced-form equation that allows to identify the effect of automatic wage changes holding negotiated changes constant.

Our empirical results show a strong effect of wage compression on the probability of moving from dependent- to self-employment. As a consequence, the gradual abolition of the Scala Mobile generated a reduction in the flows of high-wage workers into self-employment and a higher rate of transition among low-wage earners.

With these findings this paper contributes to at least to strands of the literature. First, it adds important theoretical arguments and empirical evidence to the role of labour market institutions and especially institutions that compress the distribution of wages. Second, it provides new results to the study of self-employment, an issue that has so far received relatively little attention.

The paper is organized as follows. Section 2 provides a brief history of the Scala Mobile. Section 3 presents a simple theoretical model that describes the relationship between wage dispersion and the individual decision to become a self-entrepreneur. Section 4 describes the data that are used in Section 5 to produce empirical evidence to support the predictions of the theory. Section 6 concludes.

## **2 A brief history of the Italian Scala Mobile**

Wage indexation mechanisms started to be adopted in Italy in 1945 with large differences across sectors, geographical areas, qualifications and even gender. There was, in fact, no legislation on this issue and the entire matter was delegated to bilateral negotiations between unions and employers.

During all the 70's the Italian unions developed a stronger and stronger preference for an egalitarian treatment of all workers and were consequently strongly against the coexistence of different wage indexation mechanisms. This approach led in 1975 to an important agreement with the employers' federation (*Confindustria*) that imposed the same indexation system to all workers (except managers, which are however excluded from our analysis) in the industrial sector eliminating all differences across qualifications, geographical areas, age and gender groups.<sup>4</sup>

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<sup>4</sup>*Accordo Agnelli-Lama*, signed on January 25th 1975.

In the following two years, this agreement was adopted by all other sectors until, in 1977, a national law prohibited any indexation system different from the one defined in the 1975 agreement.<sup>5</sup> In practice, since January 1977 every dependent employee was subject to the same wage indexation, the so-called Scala Mobile.<sup>6</sup>

This common mechanism offered all workers the same nominal wage increase (*contingenza*) for each point change in a purposely constructed price index (the *indice dei prezzi al consumo per le famiglie di operai e impiegati*). Initially, the amount of the increase was fixed at 2,389 Italian liras (about 2.73 dollars as of 1977) per point change at a quarterly frequency (paid in January, April, July and October).

The Scala Mobile remained unchanged until January 1983. Since a couple of years, in fact, the system had been under pressure due to the exceptional inflation rates experienced in the country (21.2% in 1980). On January 23rd 1983 a new agreement was signed that included an update of the price index and the *contingenza*.<sup>7</sup> The base of the price index was changed from October 1974 to October 1982 and the *contingenza* point increased to 6,800 Italian liras. All in all, this change amounted to a real reduction in the generosity of the *contingenza* point of about 15%.<sup>8</sup>

In the following years the Scala Mobile was the object of a fierce opposition, especially from skilled workers who perceived its strong equalizing effect as unfair. This led to some disagreement among the major trade unions and eventually to a referendum in 1985. The object of the referendum was effectively a relatively minor issue, i.e. the

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<sup>5</sup>An agreement was reached on January 26th 1977, included in the government decree n.12 dated February 1st 1977 and formalised in the law n. 91 of 31st March 1977. Effectively, the new system was first adopted for the computation of the wage increases of February 1977.

<sup>6</sup>The only exceptions were managers and employees in the public sector, where the common system was introduced a little later, in July 1978.

<sup>7</sup>*Protocollo Scotti*.

<sup>8</sup>Mechanically applying the change in the base period for the price index would have led to a *contingenza* point of 8,003 liras.

abolition of an agreement signed in 1984 only by some unions (CILS and UIL but not the CGIL, the largest and more leftist among the three) that introduced predetermined caps to the Scala Mobile payments.<sup>9</sup> In practice it became a referendum on the Scala Mobile itself and the defeat of the most intransigent positions on this occasion led to a rather drastic change of system in 1986.

The agreement for the new system, signed on November 25th 1985, introduced important modifications. First, the indexation was computed every 6 rather than 3 months, in April and October. Second and most important, the indexation mechanism was radically modified. For each worker the total wage was divided into two parts. The first part, equal to a fixed base wage, differentiated across industrial sectors and qualifications, was fully indexed, i.e. increased by the same percentage change observed in the price index. The remaining part of the wage (excluded some minor components related mostly to productivity premia) was indexed only by 25%, i.e. only 1/4 of this part was increased according to observed changes in the price index.

To clarify the functioning of this (after 1986) system, suppose a worker earns 1,000,000 liras per month, where 500,000 is the base wage in the relevant industry-qualification cell. Suppose also the price index has increased by 10% since the last indexation. Then, this worker will receive 10% of 500,000 (full indexation of the base wage), i.e. 50,000 liras, plus 10% of 1/4 of the remaining 500,000, i.e.  $0.1 \times 0.25 \times 500,000 = 12,500$ . In total a wage increase of 62,500 liras. Erickson and Ichino [1995] report that under this system the overall degree of indexation was approximately 50% for blue collars and 40% for white collars.

The 1985 agreement was set to expire at the end of 1989 and was then extended to December 1991. On this date, however, unions and employers did not reach an

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<sup>9</sup>Effectively applied only in January and April 1984.

agreement and the Scala Mobile was eventually abandoned. The last automatic wage increase was paid in October 1991. The entire system of wage negotiations was then revised with two agreements on July 1992 and July 1993 but no automatic indexation mechanism was ever re-introduced.

Table 1 describes the evolution of the Scala Mobile for blue and white collars during the entire period from January 1977 to October 1991. Until 1985, the table reports the quarterly level of the price index, the point change, the amount of the *contingenza* and the corresponding lump-sum wage increase. After 1985, we instead report only the percentage change in the semestral price index and calculate the wage increase associated with the full indexation of the base wage in the manufacturing sector.

For the first period (1977-1985), we also compute (column 5) for every year the wage level that, given the lump-sum payments of column 4, resulted to be fully indexed towards the change in the (un-rounded) price index of column 1. The Scala Mobile generated real wages increases below this level and real wage cuts above.

For comparison purposes, column 6 reports the year median wage as computed from our data (see section 4 for a detailed description). The system was in fact a lot less generous after 1983 (and supposedly even less after 1986), with imputed fully indexed monthly wages (column 5) declining from about 75% of the median to about 55% on average.

To gauge the powerful equalizing effect of the Scala Mobile, Figure 1 reports what would have been the evolution of the distribution of wages over time if the only changes were due to the indexation mechanism. The dotted line in the top left panel represents the estimated kernel density of the actual distribution observed in our data for blue and white collar workers in 1977. All the other distributions are constructed by adding the Scala Mobile payments to each individual wage year by year. All distributions are also

normalized around their means so that differences are only generated by changes in the variance.

The first three panels (top left, top right and bottom left) show the distributions at the beginning of each sub-period (1977-1982, 1983-1985, 1986-1991) and after three years and indicate that, over a comparable time span, the Scala Mobile exerted a much stronger equalizing effect before the 1983 reform, a milder but still considerable effect between 1983 and 1985 while after 1986 the compression effect had almost completely disappeared. The last panel (bottom right) compares the initial (1977) and the final (1991) distributions and shows that, absent other changes, the equalizing effect of the Scala Mobile over the entire period would have been huge.

### **3 A simple theory of wage compression and self employment**

The simple theory in this section borrows heavily from the recent work of Malchow-Møller et al. (2005).<sup>10</sup> All individuals start their working lives as dependent employees and may choose to move to self-employment at some point during their career.<sup>11</sup> For simplicity, self-employment is an absorbing state and once the transition is made one can not go back to dependent employment.

Workers are heterogeneous in their productivity, which depends on individual ability  $\alpha_i$ , increases with experience as dependent employee  $d$ , and is subject to random productivity shocks  $\epsilon_{it}$ , that are uncorrelated both over time and across individuals. Call

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<sup>10</sup>Our model is simpler and developed in partial equilibrium only but it has a richer empirical content.

<sup>11</sup>This is in fact the typical career path of most self-employed workers. In very few instances (mostly persons joining family businesses) people start their own business without any previous experience. Moreover, in our data we can only observe individuals who have had at least one spell of dependent employment.

$\mu_{it}(\alpha_i, d)$  the deterministic component of the productivity of worker  $i$  with experience  $d$  at time  $t$  so that actual productivity will be equal to  $\mu_{it}(\alpha_i, d) + \epsilon_{it}$ .

When a worker moves to self-employment, her productivity stops benefiting from experience (i.e. learning only takes place during dependent employment). Following Malchow-Møller et al. (2005), we assume that in self-employment one can better exploit her production potential so that productivity gets multiplied by a factor  $\beta_1 > 1$ .<sup>12</sup> Self-employment also requires some additional cost (in terms of time or risk) which we measure with a fixed factor  $\beta_0 > 0$ . Given the above assumptions, the return from self-employment at time  $t$  for worker  $i$  who has left dependent employment after  $d$  periods can be written as:

$$v_{it}(d) = \beta_1 \mu_{id}(\alpha_i, d) - \beta_0 + \beta_1 \epsilon_{it} \quad (1)$$

Assume individuals can work for a deterministic finite number of periods  $T$  and at every period decide whether to remain in wage employment or move into self-employment by comparing the marginal benefits of these two alternatives. The marginal benefit of spending one additional period in dependent employment is equal to the real wage  $w_{it}$  plus the increase in the future returns to self-employment due to learning. On the other hand, the marginal benefit of moving to self-employment is simply  $v_{it}(t)$ .

Assume that the productivity shock  $\epsilon_{it}$  is realized at the beginning of each period, then, the optimal decision rule for worker  $i$  at time  $t$  can be described as follows:<sup>13</sup>

$$\begin{aligned} w_{it} + (T - t) \frac{\partial v_{it}(t)}{\partial t} &\geq v_{it}(t) && \text{remain in dependent-employment} \\ w_{it} + (T - t) \frac{\partial v_{it}(t)}{\partial t} &< v_{it}(t) && \text{move to self-employment} \end{aligned} \quad (2)$$

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<sup>12</sup>One alternative interpretation of this assumption is that there is some natural degree of wage compression in what workers are paid less than their full productivity potential

<sup>13</sup>This condition is fully equivalent to equation (14) in Malchow-Møller et al. (2005), who derive it from a more sophisticated model in continuous time and in a fully deterministic framework

Let us start from the benchmark situation in which workers are paid their marginal product and there is no wage compression. Under such conditions,  $w_{it} = \mu_{it}(\alpha_i, d) + \epsilon_{it}$  and it is easy to derive the probability that worker  $i$  moves to self-employment at time  $t$  -  $P_{it}$  - from equation 2 as follows:

$$P_{it} = \Pr \left\{ \epsilon_{it} < \left( \frac{1}{\beta_1 - 1} \right) \left[ \beta_0 + (T - t) \frac{\partial v_{it}(t)}{\partial t} \right] - \mu_{it}(\alpha_i, t) \right\} \quad (3)$$

Under some mild assumptions, it can be shown that  $P_{it}$  increases with  $\alpha_i$ . This implies that on average there should be more high-ability individuals among the self-employed and that the more able self-employed moved away from dependent employment earlier in their careers.

What happens when we introduce wage compression? In view of the empirical implementation of the model, it is worth analyzing in some details the specific mechanism of the Scala Mobile. In a perfectly competitive labour market where wages are set equal to marginal product, the nominal wage for a worker of ability  $\alpha_i$  at time  $t$  can be written as:

$$W_{it} = P_t \mu_{it}(\alpha_i, t) \quad (4)$$

where  $P_t$  is the price level at time  $t$ .

Equation 4 implies that the nominal wage change between time  $t - 1$  and time  $t$  is:

$$W_{it} - W_{i(t-1)} = P_t \mu_{it}(\alpha_i, t) - P_{t-1} \mu_{i(t-1)}(\alpha_i, t - 1) \quad (5)$$

$$= \underbrace{\Delta P_t \mu_{i(t-1)}(\alpha_i, t - 1)}_a + \underbrace{P_t \Delta \mu_{it}(\alpha_i, t)}_b \quad (6)$$

In other words, in the absence of any wage compression institution, changes in nominal wages should be driven by two factors. First, the valuation of the past productivity level

should be updated to the new prices (term (a) in equation 5). Second, any change in productivity should be evaluated at current prices and included in the new wage (term (b) in equation 5). The change in the real wage would simply be  $\Delta\mu_i(\alpha_i, t)$ .

The Scala Mobile essentially forces term (a) in equation 5 to be the same for all workers and determined according to a fixed rule that multiplies the *contingenza* point by the change in the price level (measured by a specific price index). In reaction to this system, it is likely that employers adjust the remaining part of the wage change (term (b)). It is difficult to understand the direction of this adjustment. On the one hand, employers may want to remunerate the more productive workers for the fact that the Scala Mobile does not compensate them entirely for the increase in prices. However, firms will not be able to compensate all workers fully as long as the Scala Mobile increases the real wages of some workers more than their actual productivity. Firms may also make adjustments on the employment dimension but the extent to which this was possible was limited by the strict firing restrictions that were (and for a large part still are) in force at the time of the Scala Mobile.

As shown in Table 1, the Scala Mobile implied real wage increases for all workers earning less than 50% to 90% of the median wage. It is therefore unlikely that these wage increases could be systematically compensated by analogous productivity improvements. Necessarily, employers would be forced to use the productivity gains of some workers to finance the Scala Mobile payments of the least productive ones. We will make use of this fact in the following section for identification purposes.

Under the Scala Mobile nominal wages changes can be described as follows:

$$W_{it} - W_{i(t-1)} = s\Delta P_t + H_{it} \quad (7)$$

where  $s$  is the nominal *contingenza* point and  $H_{it}$  is an unspecified additional term which may vary both with  $i$  and over time and is freely determined by bilateral negotiations between the individual worker and the employer.

Using equation 7 we can derive an expression for the real wage:

$$w_{it} = \frac{W_{it}}{P_t} = \frac{W_{i(t-1)}}{P_t} + s \frac{\Delta P_t}{P_t} + \frac{H_{it}}{P_t}$$

which, after some manipulation, can be rewritten as:

$$w_{it} = w_{i(t-1)} + \frac{\pi_t}{1 + \pi_t} [s - w_{i(t-1)}] + h_{it} \quad (8)$$

where  $\pi_t$  is the percentage change in prices between time  $t-1$  and  $t$  (the inflation rate) and  $h_{it} = \frac{H_{it}}{P_t}$ .

Equation 8 shows that for all workers with real wages above  $s$  the Scala Mobile induces real wage cuts for every positive change in the price index. It also clarifies that residual wage changes -  $h_{it}$  - may be decided by negotiations between employers and employees.

Combining equations 8 and 2 it is easy to notice that, the Scala Mobile, by reducing the real wage of the most productive workers and increasing that of the least productive, should induce lower transition probabilities for the first and higher for the latter.

The empirical analysis of the next section is based on this intuition.

## **4 The INPS Social Security Archives for the provinces of Treviso and Vicenza**

The dataset used for this study is derived from the archives on the Italian Social Security Administration (INPS). It contains information on all workers who have worked as dependent employees for at least one day in one of two provinces in the Northeast of the country - Vicenza and Treviso - regardless of the worker's place of residence.

To be included in the dataset a worker needs to have paid social security contributions at least for one day of work from an establishment based in these two provinces during the period between January 1975 and December 1997. Once this condition is met, the entire working history is reconstructed, importing information also from employment spells outside Vicenza and Treviso.

The unit of observation is the individual employment relationship with 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, fixed vs. long-term), the industrial sector of activity, the geographical location of the establishment, gender, age and citizenship of the worker. Both workers and establishments are individually identifiable and can be followed over time.

Three important drawbacks of this dataset are worth mentioning. First, there is no information on education. Second, once a worker disappears from the dataset we cannot say whether he/she was unemployed or inactive. We do observe, however, if he/she returns to work. Third, the set of available information for the self-employed is very limited. Essentially, only the dates of entry and exit from the archive of the self-employed can be observed. There is no record of earnings nor of paid contributions.

For our purposes we define a match as a worker-firm pair in a given broad quali-

fication group (blue collar, white collar, manager), i.e. a promotion from blue collar to white collar or from white collar to manager gives rise to a new match.<sup>14</sup> Matches can, thus, end into another match with the same firm (promotions/demotions), another match with a different employer, non-employment (unemployment/inactivity) or self-employment. In order to focus only on true transitions to self-employment we exclude transitions to *collaboratore*, a particular form of self-employment that often hides simple transformations of dependent-employment relationships, and transitions that led to self-employment spells shorter than 1 year, which may capture hidden unemployment spells.<sup>15</sup>

Eventually, we focus on employment spells of full-time employees, aged between 15 and 55 (to exclude early transitions to retirement through self-employment) and during the period 1977-1995. As described in Section 2, before 1977 different wage indexation mechanisms were adopted across sectors, geographical areas, age and even gender groups. Consequently, the Scala Mobile effectively started to exert its equalizing effect from 1977 when it was harmonized for all workers, except managers and public sector employees (who, however, joined the common system only a little later in 1978). Our analysis stops in 1995 because in 1996 a new archive for self-employed workers (mostly free-lancers) has been created but it is not yet available for research purposes.

To avoid stock sampling bias, employment spells that started before January 1st 1977 have been dropped.<sup>16</sup> Monthly wages are computed as the total (gross) compensation divided by the number of working weeks per month with a top and bottom coding

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<sup>14</sup>The same for demotions, which are however extremely rare.

<sup>15</sup>E.g. unemployed persons paying voluntary contributions. Sometimes, also the compulsory military service is recorded as a short spell of self-employment.

<sup>16</sup>Jobs in the public sector are left censored at July 1978, when the common Scala Mobile mechanism was extended to public sector employees.

at a 0.5% threshold within qualification and year cells.<sup>17</sup>

Eventually, the sample that will be used for the empirical analysis of Section 5 includes 3,009,492 match-year observations, corresponding to 742,482 matches of 500,603 individuals in 70,330 firms. Table 2 reports some descriptive statistics for this sample.

## 5 Empirical strategy and results

In this section we want to provide evidence on the causal link between wage compression and transitions to self-employment. The section is divided into three parts. First we present and discuss some aggregate evidence. Then, we exploit the exogenous variation in wage inequality induced by the three reforms of the Scala Mobile to show that after each policy change the effect of transition probabilities differ significantly between jobs at the top and at the bottom of the distribution, as predicted by the model of section 3. Finally, in the third and last part, we estimate an empirical model for the transition probability that exploits variation induced both by policy changes and year-to-year fluctuations in inflation to identify the effect of automatic wage changes at the individual level.

### 5.1 The aggregate evidence

Before moving to the empirical implementation of the model of section 3, let us take a quick look at the aggregate evidence. The top panels of Figure 2 plot the evolution of the standard deviation of log weekly wages for the entire sample (left panel) and for men and women separately (right panel). This figure is remarkably similar to those reported

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<sup>17</sup>The number of weeks does not correspond exactly to worked weeks. It is rather the number of valid weeks used to administratively compute pay and contributions, i.e. it includes paid absences and paid vacations.

in other papers that look at the evolution of wage inequality (Cappellari [2004]) in Italy around the same period and suggests that, despite our focus on the two provinces of Vicenza e Treviso, our results are likely to be fairly general.

Wage inequality in Italy declines until the early 80s and, almost in perfect correspondence with the reforms of the Scala Mobile, starts to increase rapidly until the end of our period of observation. This upward trend is much more marked for women than for men. Manacorda [2004] finds the same result using survey data and explains it with the fact that women have on average lower earnings than men and the Scala Mobile exerted a stronger equalizing effect at the bottom of the distribution than at the top. The abolition of the automatic wage indexation scheme, thus, led to higher inequality among women than men.

Manacorda [2004] provides evidence that the evolution of the Scala Mobile explains these trends to a large extent. His identification strategy is based on the differences between men and women, an approach that we do not want to follow here. Comparing the evolution of men's and women's trends in inequality and self-employment would require the assumption that, in the absence of policy changes, the two genders were subject to the same aggregate shocks. We do not believe this is a tenable assumption given that during the period covered by the Scala Mobile the role of women in the labour market has undergone tremendous changes.<sup>18</sup>

The bottom panels of Figure 2 report the evolution of transition rates from dependent to self-employment. On average about 1% of matches ends into self-employment every year with a declining trend over time. The decline actually started before the increase

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<sup>18</sup>We have, however, produced differences-in-differences estimates of the effect of the three Scala Mobile reforms on the probability of moving from dependent- to self-employment along the same lines of section 5.2 using women and men as treatment and control group respectively. The results confirm that after each reform the transition rate declined more for women than for men.

in wage inequality but continued uninterrupted for the entire period and flattens only towards the mid 90s.

Again, the evolution of transitions rates differ substantially for men and women. The secular decline seems to be driven mostly by men although women also show a less pronounced downward trend. More importantly, the decline for women seem to be more closely related with the period of the Scala Mobile reforms. In fact, there seem to be no detectable change for women before 1983 while the mild decline starts precisely with 1984. As already mentioned, however, this has been a period of dramatic changes in the female labour market with potentially very large compositional effects altering the picture that emerges from these aggregate data.

Overall, Figure 2 indicates clearly that transition rates from dependent- to self-employment have been generally declining during a period of rapidly increasing wage inequality. In the remaining of this section we will try to establish whether this relationship can be given a causal interpretation focusing specifically on some points of the wage distribution.

## **5.2 Differential effect of the Scala Mobile reforms along the wage distribution**

In this section we exploit the policy changes of 1983, 1986 and 1991 as exogenous sources of variation in the degree of wage compression to identify the effect on the probability of moving from dependent to self employment. The gradual abolition of the Scala Mobile relaxes the constraints imposed on the wage structure and leads to lower compression and larger wage differences.

According to the arguments presented in section 3, a more dispersed wage distri-

bution should have different consequences for different workers. For the most able it should lead to a lower probability of moving from dependent to self-employment. The opposite should happen at the bottom of the wage distribution for the least able workers. For these workers a less compressed distribution of wages implies higher returns from dependent employment and therefore potentially lower transition rates to self-employment.<sup>19</sup>

Unfortunately, the policy interventions that modified the scala mobile changed the system for all workers in the same way and there is no control group available. It is therefore impossible to identify the effect of the policy changes directly at different points of the distribution. All we can do is estimating the differential effect by comparing, for example, what happens before and after each policy change to workers at top and the bottom of the wage distribution.

To this end we select only workers whose wages remain either in the top or in the bottom 20% of the distribution of wages during all the years of their spell of dependent-employment and we estimate a series of linear probability models the following type:

$$\Pr(s_{ijt} = 1 | s_{ij(t-1)} = 0, \mathbf{x}_{ijt}) = \gamma [top_{ij} \times after_t] + \delta \mathbf{x}_{ijt} + v_t + \eta_{ij} + u_{ijt} \quad (9)$$

where  $s_{ijt} = 1$  if match  $ij$  (i.e. individual  $i$  in firm  $j$ ) ends into self-employment at time  $t$  (0 otherwise),  $top_{ij} = 1$  if match  $ij$  belongs to the top 20% of the distribution (0 otherwise),  $after_t = 1$  for all years  $t$  after the reform.  $\mathbf{x}_{ijt}$  is a set of control control variables that includes the following: age and age squared, firm size and firm size

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<sup>19</sup>Wage compression may in principle induce some low-productivity workers to move to self-employment via a reduction in job creation. This is the mechanism that Malchow-Møller et al. [2004] use to explain the existence of a non negligible group of self-employed with very low productivity levels. In the context of this paper, however, the focus on workers who have had at least one spell of dependent employment does not allow to detect this demand-side effect.

squared and a third order polynomial of job duration.  $v_t$  is a common aggregate time effect,  $\eta_{ij}$  is a match fixed-effect and  $u_{ijt}$  is random error. Our parameter of interest is  $\gamma$ , which measures the differential effect of the reform at the top of the wage distribution.

We estimate separate models for each reform selecting the appropriate time range as follows: to identify the effect of the 1983 reform we only consider the years between 1977 and 1985, for the 1986 reform we use the period 1983-1990 and, finally, for the 1991 reform we consider the years 1986-1995. The results are reported in Table 3 where the estimates are also produced separately for men and women.<sup>20</sup>

In all cases only the 1983 and 1986 reforms appear to have had a significantly different impact on the transition probability from dependent- to self-employment for workers at the top and the bottom of the distribution. The size of the difference is non-negligible: after each reform the transition probability goes down by approximately one percentage point.<sup>21</sup> The estimates for the two reforms are very similar and the effect is larger for men than for women: about 2 percentage points for men and about half of a percentage point for women. Not surprisingly, the final abolition of the wage indexation scheme in 1991 had no effect. The system, in fact, had already lost its compressing power almost completely after the modifications introduced in 1986 (see Section 2).

The identification in this section exploits the fact that the Scala Mobile had different effects at different points of the wage distribution. However, in Table 3 we limit our attention only at the top and the bottom end of the distribution. In the following section, instead, we look at the entire distribution and make use of the peculiarities of the Scala Mobile to identify for each worker the effect of automatic wage changes controlling for

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<sup>20</sup>The definition of top and bottom 20% is always based on the entire (i.e. men and women) wage distribution.

<sup>21</sup>Note that this is the conditional probability, i.e. the probability of making a transition at time  $t$  conditional on having remained in dependent employment until time  $t - 1$ .

possible negotiated adjustments.

### 5.3 Exploiting automatic wage changes at the individual level

The identification based on the comparison of workers at the top and the bottom of the wage distribution rests on the fact that wage compression has different implications for different workers. Obviously, these differences are more marked when one compares the two extremes of the distribution. However, as long as two workers are paid two different wages the effect of exogenous changes in wage compression will be different. In this section we will exploit the entire evolution of the Scala Mobile (not just the reforms) to extrapolate exogenous changes in individual wages due to this particular wage indexation scheme and identify its impact on our outcome of interest.

Specifically, we want to estimate the following linear probability model:

$$\Pr(s_{ijt} = 1 | s_{ij(t-1)} = 0, \mathbf{x}_{ijt}) = \theta w_{ijt} + \delta \mathbf{x}_{ijt} + v_t + \eta_{ij} + u_{ijt} \quad (10)$$

which can be easily derived from the first order conditions 2 where the error term  $u_{ijt}$  includes random shocks to productivity and the correlated returns to self-employment  $v_{it}$  which is unobservable. The other terms have the meaning described earlier.

Equation 8 in section 3 shows that under the Scala Mobile the real wage of worker  $i$  in firm  $j$  at time  $t$  ( $w_{ijt}$ ) can be written as the sum of three elements: the real wage at time  $t - 1$ , the automatic wage increase expressed in real terms ( $\frac{\pi_t}{1+\pi_t} [s - w_{ij(t-1)}]$ ), call it  $sm_{it}$ ) and the residual negotiated wage change ( $h_{ijt}$ ).<sup>22</sup> Then, equation 10 can be

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<sup>22</sup>In Section 3 we omitted the subscript  $j$  in equation 8 for simplicity

rewritten as:

$$\Pr(s_{ijt} = 1 | s_{ij(t-1)} = 0, \mathbf{x}_{ijt}) = \theta_1 w_{ij(t-1)} + \theta_2 sm_{it} + \theta_3 h_{ijt} + \delta \mathbf{x}_{ijt} + v_t + \eta_{ij} + \epsilon_{ijt} \quad (11)$$

In our data, of the three terms that define  $w_{ijt}$ , the first -  $w_{ij(t-1)}$  - is always observable for all workers at all periods. The second term -  $sm_{it}$  - can be easily calculated on the basis of  $w_{ij(t-1)}$  and the rules of the Scala Mobile.<sup>23</sup> The more problematic is the third term. Negotiated wage changes could in principle be computed residually as  $h_{ijt} = w_{ijt} - w_{ij(t-1)} - sm_{it}$ . In order to do this, however, one needs to know the actual real wage at time  $t$ ,  $w_{ijt}$ , which is readily observable for all workers at all periods but when a transition to self-employment is made. When we observe a worker moving to self-employment, we cannot say what wage she would have earned if she had remained in dependent employment. This generates a serious identification problem for the estimation of equation 11. If  $h_{ijt}$  is omitted from the estimation and it is correlated with  $sm_{it}$ , then we would not be able to correctly identify the parameters of the model. Moreover,  $h_{ijt}$  is also likely to be endogenous in equation 11. In fact, while automatic changes can be safely assumed to be exogenous to the decision to become a self-employed as they are determined exclusively by the rules of the Scala Mobile, the magnitude of negotiate wage changes will depend on the worker's productivity. As equations 2 and 3 clearly show, random shocks to productivity influence both the returns to dependent and self-employment, thus making  $h_{it}$  potentially endogenous.<sup>24</sup>

Unfortunately, we have serious reasons to believe that automatic and negotiated wage changes are correlated. Figure 3 plots the average annual actual and automatic

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<sup>23</sup>We are also assuming that inflation shocks are realized at the beginning of each period before the employment decision is made.

<sup>24</sup>Other sources of correlation, namely differences in ability across workers, should be conditioned out by match fixed-effects.

real wage changes by deciles of the wage distribution, separately for the subperiods corresponding to the three reforms of the Scala Mobile. Negotiated wage changes are simply the difference between actual and automatic changes. The graphs show clearly that in the first two subperiods (1977-1982 and 1983-1985) the Scala Mobile was indeed offering substantial real wage increases for workers at the bottom of the distribution while top wage earners were subject to automatic wage cuts. The plot of actual wage changes indicates that firms were partially offsetting these effects, particularly through negotiated wage increases for top workers. Eventually, the distribution of actual real wage changes looks pretty flat around an average of 4%-5% which roughly corresponds to the average growth rate of the economy during that period.

After 1986, when the Scala Mobile loses most of its equalizing potential, the distribution of automatic wage changes flattens considerably while actual changes favour more explicitly the more productive workers and show a mild upward trend across deciles. This pattern becomes even more marked in the period 1992-1995 when the Scala Mobile is finally abolished.

Overall, Figure 3 suggests that when the Scala Mobile had the most powerful equalizing effects, employers were using the productivity improvements of the most productive workers to finance the high compulsory real wage increases that had to be paid to the workers at the bottom of the distribution. In fact, with the Scala Mobile imposing real wage increases of above 10% to all workers in the bottom decile, the only way employers could finance this system was by transferring the returns from productivity gains of the most productive employees towards the bottom of the distribution. Firms could have also reacted to the Scala Mobile by adjusting employment but this was severely limited by stringent employment protection for almost all workers.

Omitting  $h_{ijt}$  from equation 11 would lead to over-estimate the role of the Scala Mo-

ble as employers were able to partly offset its effects through negotiated wage changes. If we could observe all negotiated wage changes, i.e. also for workers who move to self-employment, we could solve the problem with instrumental variables. Exploiting the particular feature of our data that allow to observe all workers in any given firm, it is possible to construct an instrument for  $h_{ijt}$  by computing the sum of all real automatic wage increases within the firm normalized by the total wage bill in the previous period (also in real terms). The higher the share of the total wage bill that the firm has to pay for the automatic Scala Mobile payments the lower the possibility to further adjust individual wages to idiosyncratic changes in productivity.

Unfortunately, as already mentioned,  $h_{ijt}$  cannot be observed for all workers, in particular it is missing for those workers that move to self-employment, i.e. for those individuals that are crucial for identification, and we cannot perform a proper IV estimation. However, we can still identify the reduced form equation of what would be this IV estimation. In fact,  $SM_{jt}$  is observable for all workers, including the movers.

The reduced form equation does not allow to separately identify the effects of automatic and negotiated wage changes but it is still sufficient to correctly estimate the effect of automatic changes holding other things, including negotiated changes, constant.

$SM_{jt}$  varies across firms and within firms over time. Conditional on match fixed-effect, identification would rests on the within-match time variation which is generated both by year-to-year fluctuations in inflation and by changes in the rules of the Scala Mobile. Furthermore, the firm's wage bill at  $t - 1$  is completely predetermined at time  $t$  and independent of the idiosyncratic productivity shock, hence the normalization does not induce any further endogeneity.

Table 4 reports summary statistics for this variable with a breakdown by period of application of the Scala Mobile. On average, positive real automatic wage gains

amounted to about 8% of the total wage bill at the firm level but could be as high as 10 times the wage bill.<sup>25</sup> In the first two periods, when the Scala Mobile was more powerful, this figure ranged between 18% and 7.7% on average and went down to about half (3.5%) after the 1986 intervention.

In Table 5 we report the results of what would be the first-stage regression if we were using  $SM_{jt}$  as an instrument to estimate equation 11. Results show that for the whole sample increasing the Scala Mobile burden for the firm (the variable called  $SM_{jt}$  in the table) by one percentage point reduces the real amount of the monthly negotiated wage change by about 38,000 (1977) Italian liras, corresponding to about 30% of the average negotiated change. This correlation is stronger for women (the same effect leads to approximately 47,000 liras lower  $h_{ijt}$ ) than for men. Moreover, the t-statistics indicate that the conditional correlation between  $SM_{jt}$  and  $h_{ijt}$  is strongly significant.

Table 6 reports the estimates of equation 11 omitting  $h_{ijt}$  and its reduced form equation which looks as follows:

$$\Pr(s_{ijt} = 1 | s_{ij(t-1)} = 0, \mathbf{x}_{ijt}) = \tilde{\theta}_1 w_{ij(t-1)} + \tilde{\theta}_2 sm_{it} + \lambda SM_{jt} + \tilde{\delta} \mathbf{x}_{ijt} + \tilde{v}_t + \tilde{\eta}_{ij} + \tilde{\epsilon}_{ijt} \quad (12)$$

The difference between these two sets of estimates is generally small indicating that the extent to which firms were able to negotiate wages in such a way to undo the distortions induced by the Scala Mobile was in fact limited. The small effects of Table 5 supports this interpretation.

On the other hand, the pure effect of automatic wage changes on the transition probability to self-employment is notable. An automatic monthly real wage cut of 10,000 Italian liras (as of 1977) - the equivalent of about 11.5 US dollars of the same year

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<sup>25</sup>This generally happens in small firms and particularly following an increase in employment. Jobs in firms with only one employee have been excluded.

and corresponding to an increase of around 2.5% over the average monthly wage - increases the probability to move into self-employment by almost one tenth of a percentage points. This effect is due almost entirely to men, who appear to be more sensitive to wage changes. For them, a similar 10,000 liras cut leads to a higher transition probability by almost one third of a percentage point. The results for women are less significant but still induce sizeable effects.

In Table 7 we make some simple calculations to evaluate the overall impact of the Scala Mobile and reconcile the results presented here with what we found in section 5.2. Consider the first two columns in the upper panel which refer to the first period of application of the Scala Mobile and to the entire sample of men and women together. Over the 5 years of this period (between 1977 and 1982), a worker in the top 20% of the wage distribution (as defined above in section 5.2) received automatic wage cuts by approximately 40,000 thousands liras per month on average (around 6% of monthly wages). This implies an overall increase in the per-period (conditional) probability of transiting to self-employment of about one third of a percentage points per year, which translates into an overall decrease over the entire 5 years of 1.6 percentage point. In other words, the Scala Mobile per se would have reduced the average duration of dependent employment spells of the top-earners by about 4% over the first period of application. Workers at the bottom of the distribution were subject to opposite and more powerful effects. The 26,000 liras of average real wage increases they were receiving every year represented over 25% of real wages leading to a lower probability of moving to self-employment by about 1 percentage point over the entire period. The average duration of employment spells for these workers increased also by approximately 4%.

The other columns of Table 7 repeat this exercise for each of the periods of the Scala Mobile and the lower panels report the same figures separately for men and women.

Overall, these calculations suggest that the Scala Mobile had a very sizeable effect on transitions to self-employment with large differences at the top and the bottom of the distribution.

## **6 Conclusions**

This paper has uncovered an aspect of wage compression institutions that has been neglected so far. Labour market policies that artificially change the distribution of wages also change the incentives to undertake self-employment activities. In particular, when the wage distribution is compressed in such a way that the most productive workers are paid less than their marginal product and the least productive are remunerated more than their productivity, there will be an effect on transitions to self-employment. In particular, there will be more transitions from the top of the wage distribution and less from the bottom. Our empirical analysis shows that this is exactly the dynamics induced by the Scala Mobile - an automatic wage indexation mechanisms - in Italy from the late 70 to the early 90's. An important implication of this phenomenon that deserves further analysis is the change in the composition of the pool of the self-employed. Wage compression induces some highly paid workers who, in a perfectly competitive labour market, would have remained in dependent employment to start their own economic activities. Similarly, among the least productive workers the transitions to self-employment diminish. Understanding the relative magnitude of these two effects and its implications on the average the quality of the new enterprizes is extremely important. The overall performance of the economy, but also its ability to implement new ideas, depends crucially on the incentives to start one's own business.

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Figure 1: The scala mobile effect on the distribution of wages  
Blue and white collarsF

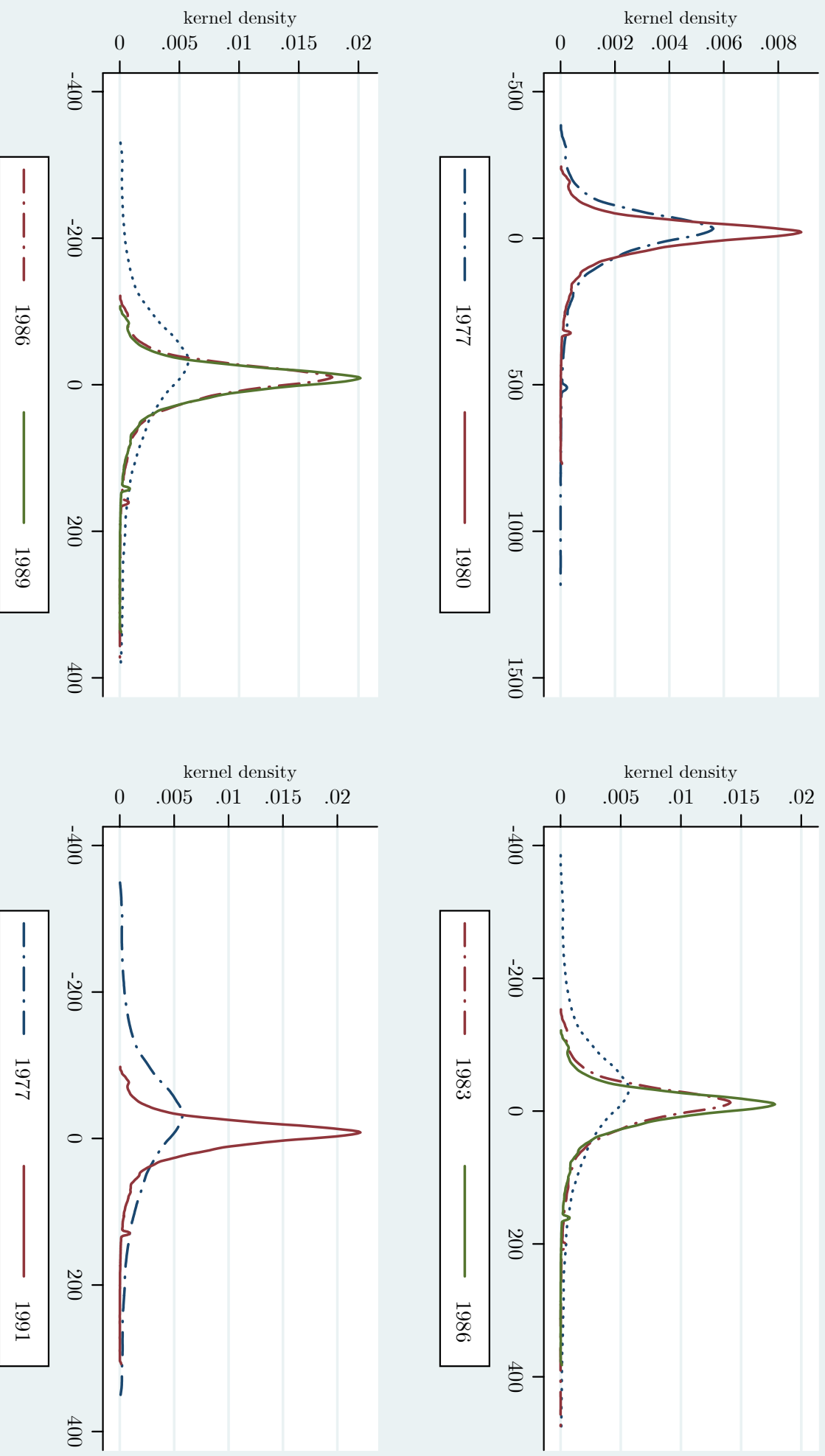
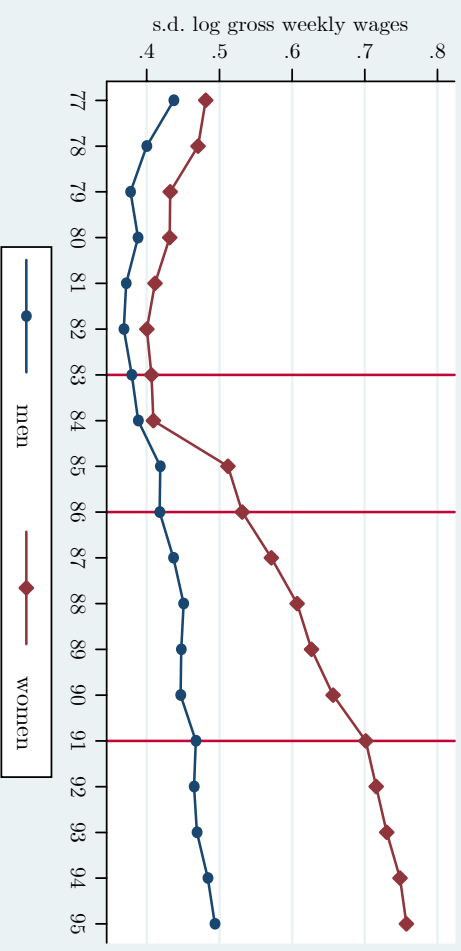
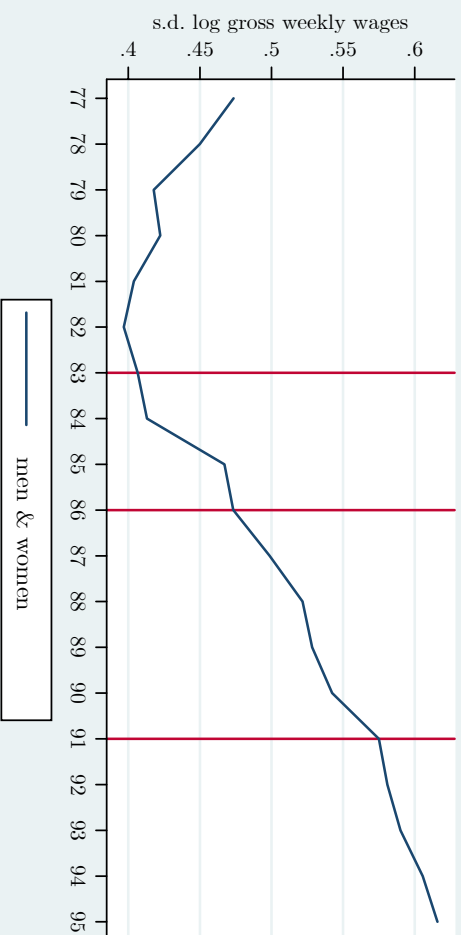


Figure 2: Wage dispersion and transitions rates for men and women

s.d. log gross weekly wages



Transition rates into self-employment

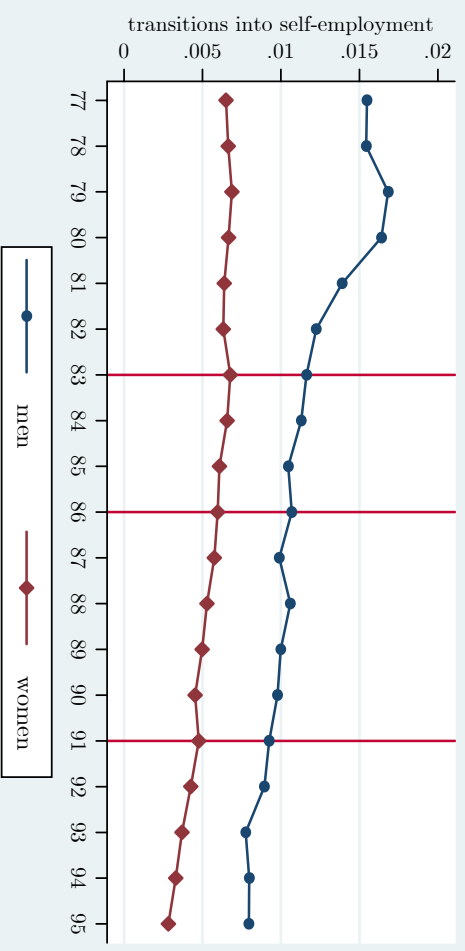
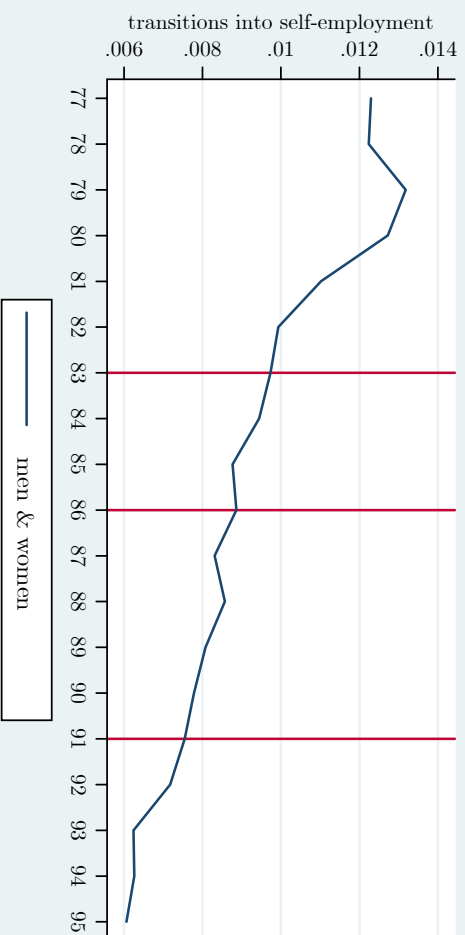
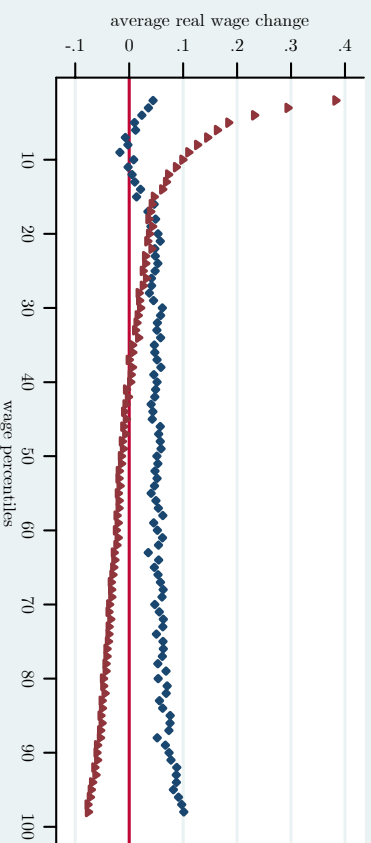
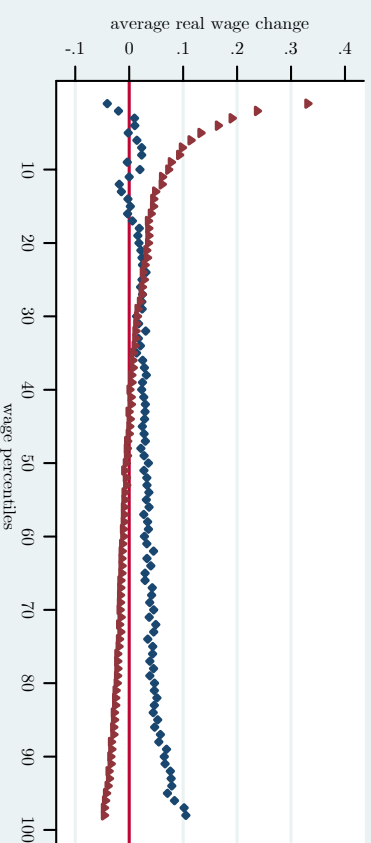


Figure 3: Automatic and actual wage changes

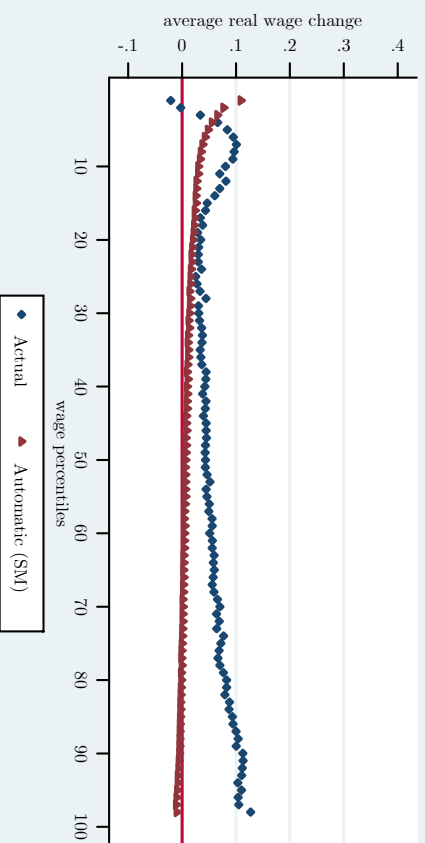
1977-1982



1983-1985



1986-1991



1992-1995

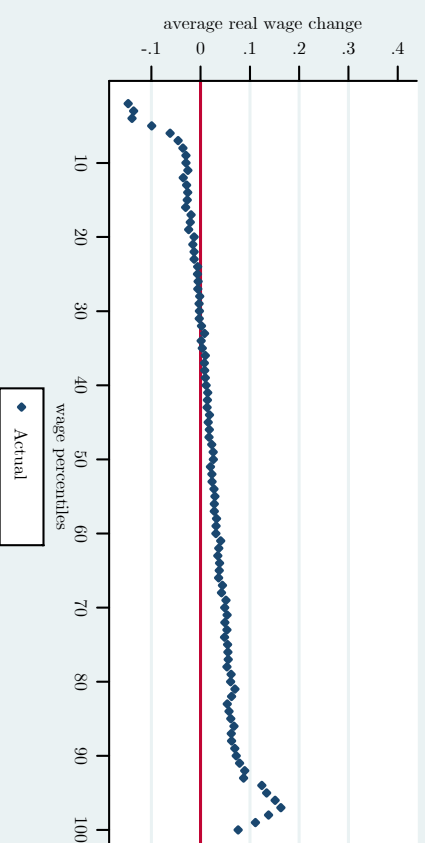


Table 1: The Scala Mobile in Italy between 1977 and 1991

Blue and White collars								
Year	Month	Rounded price index	Change in price index	<i>Contingenza</i> point	Nominal increase of monthly wage	Fully indexed (monthly) wage	Median wage	[4]/[5]
		[1]	[2]	[3]	[2]x[3] [4]	[5]	[6]	[7]
77	1	143	9		0			
77	4	149	6	2,389	14,334			
77	7	154	5	2,389	11,945			
77	10	158	4	2,389	9,556	197,983	373,750	0.53
78	1	162	4	2,389	9,556			
78	4	167	5	2,389	11,945			
78	7	173	6	2,389	14,334			
78	10	178	5	2,389	11,945	385,323	416,333	0.93
79	1	184	6	2,389	14,334			
79	4	192	8	2,389	19,112			
79	7	198	6	2,389	14,334			
79	10	206	8	2,389	19,112	426,064	509,333	0.84
80	1	214	8	2,389	19,112			
80	4	226	12	2,389	28,668			
80	7	234	8	2,389	19,112			
80	10	244	10	2,389	23,890	430,246	611,083	0.70
81	1	255	11	2,389	26,279			
81	4	269	14	2,389	33,446			
81	7	279	10	2,389	23,890			
81	10	288	9	2,389	21,501	562,118	760,083	0.74
82	1	297	9	2,389	21,501			
82	4	309	12	2,389	28,668			
82	7	322	13	2,389	31,057			
82	10	335	13	2,389	31,057	688,853	886,250	0.78
83	1	104	4	6,800	27,200			
83	4	107	3	6,800	20,400			
83	7	110	3	6,800	20,400			
83	10	112	2	6,800	13,600	544,000	1,023,417	0.53
84 <sup>1</sup>	1	117	2	6,800	13,600			
84 <sup>1</sup>	4	120	2	6,800	13,600			
84	7	123	3	6,800	20,400			
84	10	124	1	6,800	6,800	513,208	1,145,500	0.45
85	1	127	3	6,800	20,400			
85	4	131	4	6,800	27,200			
85	7	133	2	6,800	13,600			
85	10	135	2	6,800	13,600	869,767	1,271,000	0.68
Year	Month	Rounded price index	% change in price index	Minimum wage <sup>2</sup>	Fixed full increase			
		[1]	[2]	[3]	[2]x[3] [4]			
86	4	138	2.72	580,000	15,776			
86	10	142	2.90	595,776	17,271			
87	4	145	2.61	613,047	16,015			
87	10	149	2.59	629,062	16,275			
88	4	153	2.64	645,337	17,011			
88	10	157	2.63	662,348	17,444			
89	4	162	3.43	679,792	23,287			
89	10	167	3.00	703,080	21,123			
90	4	173	3.68	724,203	26,664			
90	10	179	3.35	750,866	25,149			
91	4	187	4.34	776,015	33,676			
91	10	194	3.51	809,691	28,438			

Note: all amounts reported in current Italian liras

1. Occasional caps to wage increases were adopted.

2. In manufacturing

**Table 2: Descriptive statistics**

Variable	All		Men		Women	
	Mean	Std.	Mean	Std.	Mean	Std.
Women	0.400		0.00		1.00	
Age	27.6	9.4	28.4	9.9	26.6	8.6
Monthly wage <sup>1</sup>	1,914,952	869,432	332.6	199.3	282.4	153.3
Firm size	201.3	602.1	180.1	563.4	238.6	660.4
Industrial sector	Agriculture	0.005	0.006		0.003	
	Manufacturing	0.646	0.714		0.558	
	Services	0.174	0.172		0.176	
	Public Administration	0.154	0.107		0.262	
Qualification	Blue collars	0.741	0.804		0.649	
	White collars	0.259	0.196		0.351	
Completed tenure <sup>2</sup>	4.23	2.98	4.28	3.08	4.18	2.86
Number of individuals	500,603		298,949		201,654	
Number of firms	70,330		70,330		70,330	
Number of jobs <sup>3</sup>	742,482		445,804		304,030	
Observations	3,009,492		1,808,229		1,201,236	

1. In thousands of (1997) Italian liras

2. In years

3. A job is defined as a firm-worker match where the general qualification of the worker (blue collar, white collar, manager) remains unchanged.

**Table 3: Differential effect of the Scala Mobile reforms at top and bottom of the wage distribution**

Dependent variable = 1 if a transition is made, 0 otherwise

	Sample <sup>1</sup> :			Men & Women			Men			Women		
	Reform:	1983	1986	1983	1986	1991	1983	1986	1991	1983	1986	1991
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]		
[top] x [after reform]		-0.010*** (0.003)	-0.009*** (0.003)	0.002 (0.003)	-0.020*** (0.007)	-0.022*** (0.008)	-0.002 (0.007)	-0.005* (0.003)	-0.006** (0.003)	-0.001 (0.004)		
Age		0.237 (0.238)	-0.011* (0.006)	-0.014** (0.007)	0.238 (0.235)	-0.005 (0.006)	-0.014* (0.008)	0.034*** (0.004)	-0.008 (0.005)	0.014*** (0.002)		
Age squared		-0.000* (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)		
Firm size		-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)		
Firm size squared		0.000** (0.000)	0.000* (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)		
Elapsed duration <sup>2</sup>		-0.199 (0.238)	0.036*** (0.006)	0.038*** (0.007)	-0.194 (0.235)	0.037*** (0.007)	0.043*** (0.008)	0.000 (0.000)	0.028*** (0.006)	0.000 (0.000)		
Elapsed duration squared		-0.007*** (0.001)	-0.003*** (0.000)	-0.002*** (0.000)	-0.007*** (0.001)	-0.003*** (0.000)	-0.002*** (0.000)	-0.005*** (0.001)	-0.003*** (0.000)	-0.001*** (0.000)		
Year dummies <sup>3</sup>		yes	yes	yes	yes	yes	yes	yes	yes	yes		
Job fixed effects <sup>4</sup>		yes	yes	yes	yes	yes	yes	yes	yes	yes		
Observations		99,993	122,150	118,158	70,416	89,904	88,661	29,577	32,246	29,497		
Number of jobs		31,689	38,168	35,566	20,927	26,635	25,283	10,762	11,533	10,283		
Time period		1977-1985	1983-1990	1986-1995	1977-1985	1983-1990	1986-1995	1977-1985	1983-1990	1986-1995		

1. The sample is limited to jobs at the top 20% and the bottom 20% of the wage distribution. Jobs are classified as top (bottom) 20% if the gross weekly wage remains in the top (bottom) 20% of the yearly distribution for the entire duration of the match.

2. In years

3. In columns [1] to [3] all time dummies are also interacted with a gender dummy to allow for different aggregate time effects.

4. A job is defined as a firm-worker match where the general qualification of the worker (blue collar, white collar, manager) remains unchanged.

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 4: Real Scala Mobile wage increases over firms' wage bills**

Period	mean	median	sd.dev.	min	max
1977-1982	0.180	0.168	0.083	0.037	10.312
1983-1985	0.077	0.071	0.039	0.012	4.316
1986-1991	0.035	0.033	0.011	0.015	1.272
Total	0.080	0.056	0.019	0.012	10.312

**Table 5: Negotiated wage increases and the Scala Mobile burden at the firm level<sup>1</sup>**

Dependent variable = negotiated wage increases ( $h_{it}$ )

Sample:	Men & Women [1]	Men [2]	Women [3]
$SM_{jt}$	-0.383*** (0.027)	-0.347*** (0.041)	-0.472*** (0.037)
F-stat	[-14.61]	[-8.40]	[-12.43]
$w_{i(t-1)}$	-0.755*** (0.001)	-0.742*** (0.002)	-0.848*** (0.003)
$\Delta sm_{it}$	0.664*** (0.015)	0.715*** (0.019)	-0.114*** (0.028)
Age	0.584*** (0.154)	0.651*** (0.172)	0.055 (0.353)
Firm size	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Firm size squared	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Elapsed duration <sup>2</sup>	-0.447*** (0.154)	-0.499*** (0.172)	0.069 (0.353)
Elapsed duration squared <sup>1</sup>	-0.002*** (0.000)	-0.002*** (0.000)	-0.005*** (0.000)
Year dummies	yes	yes	yes
Job fixed effects <sup>3</sup>	yes	yes	yes
Observations	1,543,735	926,168	617,567
Number of jobs	366,214	218,268	147,946

1. We exclude jobs in firms with only one employee

2. In years

3. A job is defined as a firm-worker match where the general qualification of the worker (blue collar, white collar, manager) remains unchanged.

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 6: Linear probability model of the transition rate from dependent- to self-employment**

Dependent variable = 1 if a transition is made, 0 otherwise

	Sample:		Men		Women	
	[1]	[2]	[3]	[4]	[5]	[6]
$w_{i(t-1)}$	-0.001*** (0.000)	-0.001*** (0.000)	-0.003*** (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.002*** (0.000)
$sm_{it}$	-0.012*** (0.002)	-0.008*** (0.002)	-0.029*** (0.002)	-0.024*** (0.002)	-0.009*** (0.002)	-0.004* (0.002)
$SM_{jt}$	-	-0.028*** (0.003)	-	-0.049*** (0.005)	-	-0.026*** (0.003)
Age	0.033* (0.017)	0.033* (0.017)	0.037* (0.021)	0.036* (0.021)	-0.011 (0.031)	-0.011 (0.031)
Firm size	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Firm size squared	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000 (0.000)
Elapsed duration <sup>1</sup>	-0.018 (0.017)	-0.018 (0.017)	-0.019 (0.021)	-0.019 (0.021)	0.018 (0.031)	0.018 (0.031)
Elapsed duration squared <sup>1</sup>	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Year dummies	yes	yes	yes	yes	yes	yes
Job fixed effects <sup>2</sup>	yes	yes	yes	yes	yes	yes
Observations	1,553,230	1,553,230	933,880	933,880	619,350	619,350
Number of jobs	366,214	366,214	218,268	218,268	147,946	147,946

The monetary variables  $w_{i(t-1)}$ ,  $sm_{it}$  and are all expressed in 100,000 of (1977) Italian liras, i.e. the equivalent of approximately 24 US dollars of the same year.

1. In years

2. A job is defined as a firm-worker match where the general qualification of the worker (blue collar, white collar, manager) remains unchanged.

Robust standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 7: The effect of the Scala Mobile on the transitions to self-employment

	MEN & WOMEN							
	1977-1982		1983-1985		1986-1991		Total	
	Top 20%	Bottom 20%	Top 20%	Bottom 20%	Top 20%	Bottom 20%	Top 20%	Bottom 20%
<b>Sala Mobile</b> average yearly payment	[1]		[3]		[5]		[7]	
	absolute value <sup>1</sup>	0.2662	0.0604	-0.2621	0.0057	-0.3352	0.0753	0.0753
	% of real wage	0.2637	0.0754	-0.0300	0.0092	-0.0447	0.0860	0.0860
<b>Induced ΔP<sub>#</sub></b> (in percentage points)	[2]		[4]		[6]		[8]	
	yearly	-0.2120	-0.0481	0.2087	-0.0045	0.2669	-0.0600	-0.0600
	over the period	-1.0599	-0.0962	1.0435	-0.0226	3.7360	-0.8393	-0.8393
<b>MEN</b>								
<b>Sala Mobile</b> average yearly payment	[1]		[3]		[5]		[7]	
	absolute value <sup>1</sup>	0.2488	0.0549	-0.2716	-0.0049	-0.3442	0.0629	0.0629
	% of real wage	0.2204	0.0696	-0.0301	0.0119	-0.0448	0.0694	0.0694
<b>Induced ΔP<sub>#</sub></b> (in percentage points)	[2]		[4]		[6]		[8]	
	yearly	-0.5920	-0.1307	0.6462	0.0117	0.8191	-0.1496	-0.1496
	over the period	-2.9602	-0.2614	3.2309	0.0583	11.4675	-2.0943	-2.0943
<b>WOMEN</b>								
<b>Sala Mobile</b> average yearly payment	[1]		[3]		[5]		[7]	
	absolute value <sup>1</sup>	0.2738	0.0679	-0.2339	-0.0057	-0.2666	0.0863	0.0863
	% of real wage	0.2597	0.0767	-0.0294	0.0076	-0.0300	0.0913	0.0913
<b>Induced ΔP<sub>#</sub></b> (in percentage points)	[2]		[4]		[6]		[8]	
	yearly	-0.1154	-0.0286	0.0985	0.0024	0.1123	-0.0364	-0.0364
	over the period	-0.5768	-0.0572	0.4926	0.0121	1.5725	-0.5092	-0.5092

1. In 100,000 Italian liras as of 1977