

UNEQUAL WORKERS OR UNEQUAL FIRMS?

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Abstract

We investigate the importance of firm characteristics for the Italian earnings distribution by exploiting an extensive matched firm-employee dataset covering the period 1984-1998. The dataset includes detailed information on a representative sample of firms along with information on the whole working history of individuals who have worked for any of the sampled firms.

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1. Introduction and outline of the paper¹

Studies on the structure and evolution of inequality typically focus on changes in the distribution on workers characteristics and, possibly, changes over time in returns to those characteristics (e.g. Juhn et al, 1993; DiNardo et al, 1996). Yet, another potential source of changes in inequality is the composition of the pool of firms in a country. Abowd, Kramarz and Margolis (1999) have extensively documented a high degree of heterogeneity as concerns systematic differences across observationally similar firms. Yet, in their analysis these differences are held fixed over time and affect all wages paid by the firm equally. We push the argument a step further and investigate the possibility that *marginal* returns to workers' skills may differ across firms and its consequences for the observed distribution of earnings.

We investigate the importance of firm characteristics for the Italian earnings distribution by exploiting an extensive matched firm-employee dataset covering the period 1986-1998. The dataset includes detailed information on a representative sample of firms along with information on the whole working history of individuals who have worked for any of the sampled firms.

We estimate firm-level wage equations in order to establish how much of the wage inequality can be attributed in each year to the heterogeneity across firms of the returns to standard worker characteristics (experience, tenure, etc.), along with the influence of other standard sources of inequality (e.g. distribution of workers' characteristics). The rich information set on firm characteristics allows us to link these firm-level *prices* to firm features. We are thus able to further explain how much of the change in inequality is due to structural processes affecting the Italian economy such as the downsizing of manufacturing businesses, capital deepening, markets liberalisation, etc.

The paper is organised as follows. In section 2 we present some background evidence on the changes in the overall earnings distribution. In section 3 we describe our database. We

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then turn to an illustration of the methodology in Section 4. Section 5 introduces some evidence on the evolution of inequality on the side of firms. Estimates are presented in section 6. Section 7 concludes.

2. Background evidence

The evolution of the earnings dispersion in Italy over the period 1977-1998 is discussed by Brandolini et al. (2002) on the basis of the micro-data of the Historical Archive (HA) of the Bank of Italy's Survey of Household Income and Wealth (SHIW).² *Real monthly net earnings* are calculated by dividing total earnings, net of taxes and social security contributions, by the number of months worked in the year in each job and deflating by the consumer price index for the population as a whole. Earnings refer to all *primary* job positions, excluding *secondary* job positions, i.e. the jobs that people may have in addition to their main occupation as employees or self-employed. In this section, we summarise the evidence gathered by Brandolini et al. (2002) and we update their results to 2002.

Between 1977 and 1989, both mean and median real monthly net earnings rose by 1.8 per cent per year; from 1989 to 2002 the mean declined by around 0.5 per cent per year, and the median by 1 per cent (Figure 1, upper panel). Some of the reduction in the 1990s was due to the spread of part-time work, as is shown by the smaller drop in monthly earnings of full-time employees. Data on gross wages are not available in the SHIW, but a rough comparison with the national accounts suggests that some of the fall in net earnings in the 1990s may have been caused by the rising fiscal burden. The basic message is that the steady rise in the 1980s was replaced by an enduring fall of real after-tax labour incomes in the following decade.

² Details about the structure and quality of the survey are provided in the appendix of Brandolini et al. (2002). The use of micro-data from a household survey like the SHIW to study earnings dispersion has many problems: the pattern of non-responses may alter the representativeness of the sample; earnings may be under-reported, or not reported at all; earnings are recorded net of taxes and social security contributions; sample size is relatively small and some segments of the labour market may be insufficiently covered. The SHIW is however the only source of individual data that allows us to measure the changes in the *whole* Italian wage distribution consistently over a long period of time.

The overall earnings dispersion, as measured by the Gini index,³ shows a narrowing during the 1980s, somewhat stronger at the beginning, a sharp widening in the early 1990s and substantial stability between 1993 and 2002. The decile ratio, i.e. the ratio of the 90th percentile to the 10th percentile, shares this same pattern, though its increase start in 1989. The intensity of changes and year-to-year variations may differ, but this pattern broadly describes the evolution of earnings inequality in the main sub-groups of the population: full-time employees, both male and female salaried workers, both residents in the North and in the South. This picture must be rectified for prime-age non-agricultural male workers employed throughout the whole year, for whom the tendency towards greater inequality emerged in the mid-1980s, although in a less extreme form. This asymmetry between core employment and the full sample indicates that the relevant changes were concentrated among workers at the margins of the labour market.

The long phase of diminishing earnings inequality that ended in the 1980s is largely confirmed by the other scattered evidence available, including the information on wage differentials provided in national accounts (see Sestito, 1992; Erickson and Ichino, 1995; Brandolini, 2000). There is also a fairly general consensus that this phase dates back to the late 1960s and early 1970s, the post-war period in which industrial conflict was at its highest. In those years, bargaining power shifted sharply in favour of workers and their strongly egalitarian demands, such as equal (lump-sum) pay raises for all workers regardless of grade (e.g. Regalia, Regini and Reyneri, 1978; Erickson and Ichino, 1995). Later on, these demands translated into the 1975 reform of the wage indexation mechanism, which granted a flat-sum wage increase for each percentage point rise in the cost-of-living index. Until early 1980s, the operation of this mechanism in the presence of double-digit inflation rates imparted a strong egalitarian push to the evolution of the earnings structure, which was only partially compensated by decentralised bargaining. On the basis of evidence up to 1991, Erickson and Ichino (1995, p. 298) concluded that “the overall picture of Italy ... is of a country with a compressed wage structure that is not yet undergoing the rapid decompression experienced elsewhere during the 1980s”.

³ The Gini index is defined as one-half of the arithmetic average of the absolute values of difference between all pairs of monthly earnings divided by their mean; it ranges between 0 (perfect equality) and 1

The severe political and economic crisis of the early 1990s saw the number of resident employees, as measured in the national accounts, plummet by 670,000, or 4.0 per cent, in the fourth quarter of 1993 from the historical peak recorded in the second quarter of 1992. As is shown above, this drop in employment was accompanied by a substantial widening of wage spreads. In the rest of the 1990s, inequality did not revert to the low levels of the previous decade and, if anything, it showed a tendency to increase further.

The economic crisis as well as concomitant institutional changes may have unleashed a decompression of the wage structure, originating in factors already at work in other advanced countries. Manacorda (2000), for instance, argues that a tendency comparable in amplitude to that experienced in the United States was latent since the early 1980s but failed to emerge because of the egalitarian wage indexation mechanism. Descriptive evidence hinting at a weakening of egalitarian demands during the 1980s is summarised by Regalia and Regini (1996, pp. 823-6), who report that, in the manufacturing sector, performance-related premia and individual bonuses gradually spread, with the support of unions, through bargaining agreements at company level. After 1994, the phasing-out of contribution relief for southern firms could partly account for the return to wider geographical differentials: some firms may have been able to transfer part of the higher labour cost burden onto the most vulnerable workers, reducing their net earnings. A further factor in the 1990s may have been the spread of part-time and fixed-term employment contracts. In any case, our evidence suggests that changes in the wage structure mostly affected marginal employees, or those at the bottom of the wage scale.

3. The INPS data

The administrative databases of the National Social Security Institute (INPS) provide precise figures on pre-tax earnings and a few individual characteristics since the mid-1970s for employees in the private sector who comply with the social security regulations (with the exclusion of certain employees at the managerial level); some characteristics of the firm

(maximum inequality).

where a worker is employed may be also available from the archive on employers. These data have been extensively used in recent years (e.g. Casavola, Cipollone and Sestito, 1999).

In our analysis, we use a special sample selected from the INPS archives. In particular, we have extracted from those archives all records concerning workers who, at some point of their working life, have been employed at any of the over 1000 manufacturing firms surveyed every year by the Bank of Italy's Survey of Manufacturing Industry (SMI). This survey is very useful to our purposes since it collects detailed information on firm performance and decisions (sales, profits, liabilities, investment expenditure, number of plants, proprietary structure, etc.). Merging these two datasets provides us with the characteristics and the individual working histories of each worker employed at any of these firms over the period 1986-1998.

In the next section we illustrate how we use these data to decompose the variance of the earnings distribution.

4. Methodology

We start from a simple mincerian wage equation relating individual (log) wage to individual characteristics:

$$w_{ilt} = \alpha_t + X_{ilt}\beta_t + \varepsilon_{ilt}$$

where i stands for individual, l for firm and t for time. Therefore, w_{ilt} is the wage of worker i in firm l at time t , X_{ilt} are her (possibly time-varying) characteristics and β_t is the (vector of) returns to those characteristics in firm l at time t . Thus our specification allows for returns to workers' characteristics to change not only over time but also across (groups of) firms. A decomposition of the variance of wages will be also affected by this dimension. In fact, because of the orthogonality of the residuals of an OLS regression to the information set, we can decompose the cross-sectional variance of individual earnings as follows:

$$V(w_{ilt}) = V(a_t + X_{ilt}b_t) + V(\varepsilon_{ilt})$$

where a and b are estimates for α and β . The assumption of constant returns across firms would allow us to decompose the variance of earnings at each time t as:

$$V_t(w_{it}) = b_t' V_t(X_{it}) b_t + V_t(\varepsilon_{it})$$

where for simplicity we have embodied the constant in X . This implies that changes over time in returns to X 's will affect the distribution of earnings.

An example may help clarify why we think this is a relevant dimension when investigating the evolution of inequality. Assume only one skill S is rewarded in the labour market (say, schooling) and that there are only two firms, rewarding schooling differently (for example, because one uses ICT more intensively). At time 0 workers with skill below S_0 work in firm A and those above it in firm B, where the *marginal* return to schooling is assumed to be higher (fig. 2). Suppose that at time 1 firm B becomes on average more productive (say, an increase in TFP or higher rents to be shared between employer and employees) while the marginal return to schooling stays the same (the wage schedule shifts up to B1). This will imply that workers with schooling between S_1 and S_0 will move to firm B. Estimating a wage equation under the restriction that returns to schooling are constant across firms and can only vary over time would yield an increase in returns to S between time 0 and time 1 and, according to the above decomposition, a subsequent increase in inequality caused by this change. Yet, the example shows that this is not the case: what has increased is the overall return to production factors in firm B which has attracted workers with lower schooling. Notice that allowing for firm fixed effects in the wage equation would not solve the problem since marginal returns to skill S are still wrongly estimated. Disentangling these two causes of inequality may turn out to be relevant in policy design.

We push this line of thought forward and investigate how much these changes in returns to workers' characteristics across narrowly defined groups of firms can be explained by changes in their characteristics (average size, capital intensity, organisation of the production process, financial structure, market competition, etc.). Namely, we estimate the following regression:

$$\beta_{it} = Z_{it} \gamma + u_{it}$$

where Z are firm l characteristics as of time t .

Before turning to the estimation, the next section presents some evidence on the evolution of inequality among firms over the late eighties and nineties along few potentially relevant dimensions.

5. Inequality across firms.

In this section we exploit the available information to extract evidence on the evolution of inequality among firms along dimensions which are likely to be relevant for the distribution of individual earnings.

The Survey of Manufacturing Industry provides, among other, information on total sales, investment expenditure, total hours worked and total employment. Figure 3 plots the evolution of the variance of (the log of) per capita sales, investment expenditure and hours worked. We investigate these variables on the grounds of their tight relationship with true but unobservable measures of firm productivity (e.g. Olley and Pakes (1996), Basu (1996)). Both per capita investments and sales seem to have been characterised by a somewhat higher cross-sectional variability in the second half of the nineties; as concerns per capita hours a sharp declining trend emerges. The reported variances, though, do not control for *structural* features. Therefore we are not able to establish whether a substantially stable degree of heterogeneity along those dimensions indeed hides effects that in the aggregate cancel off. To gather some hint on the forces underlying these developments, and in particular on how much of this variance can be explained by a limited set of characteristics such as sector composition, size and geographical dimension just to mention a few, we have performed a simple exercise: we have regressed each variable for each year on a set of dummies capturing the interaction of 19 regions, 14 sector and 5 size classes. The share of unexplained variance is plotted in Figure 4. The common message is that along all three dimensions (hours, sales, investments) there has been a sharp increase in the share of unexplained variance, meaning that these selected observable characteristics are less and less able to explain the differences across firms. We expect these patterns to affect the distribution of earnings and the forces underlying its evolution.

6. Estimates

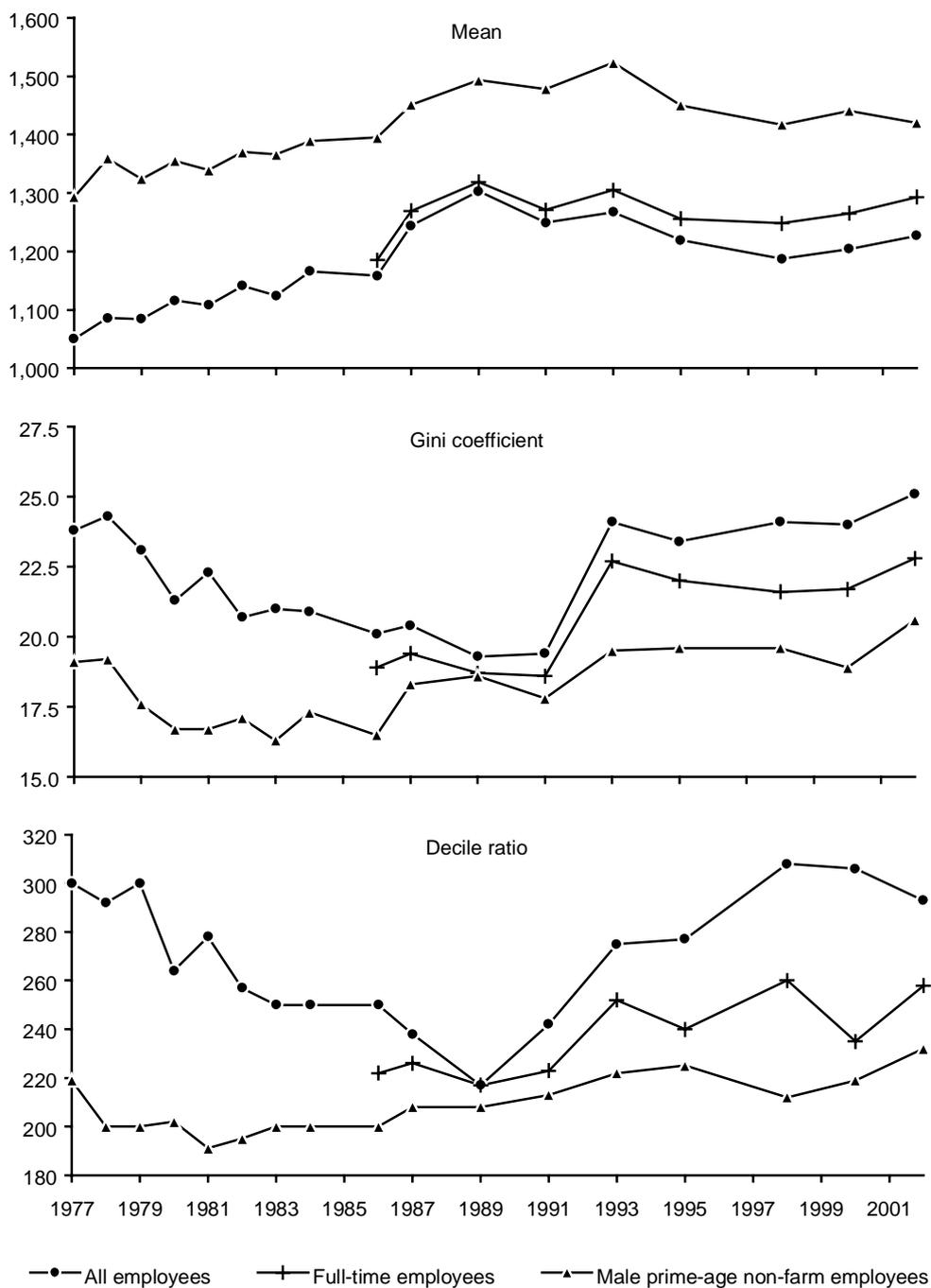
[to be written...]

7. Conclusions

[to be written...]

Figure 1

DISTRIBUTION OF REAL MONTHLY NET EARNINGS, 1977-2002
(euro at 2002 prices and per cent)



Source: authors' elaboration on data from SHIW-HA (Release 3.0, January 2004).

Figure 2

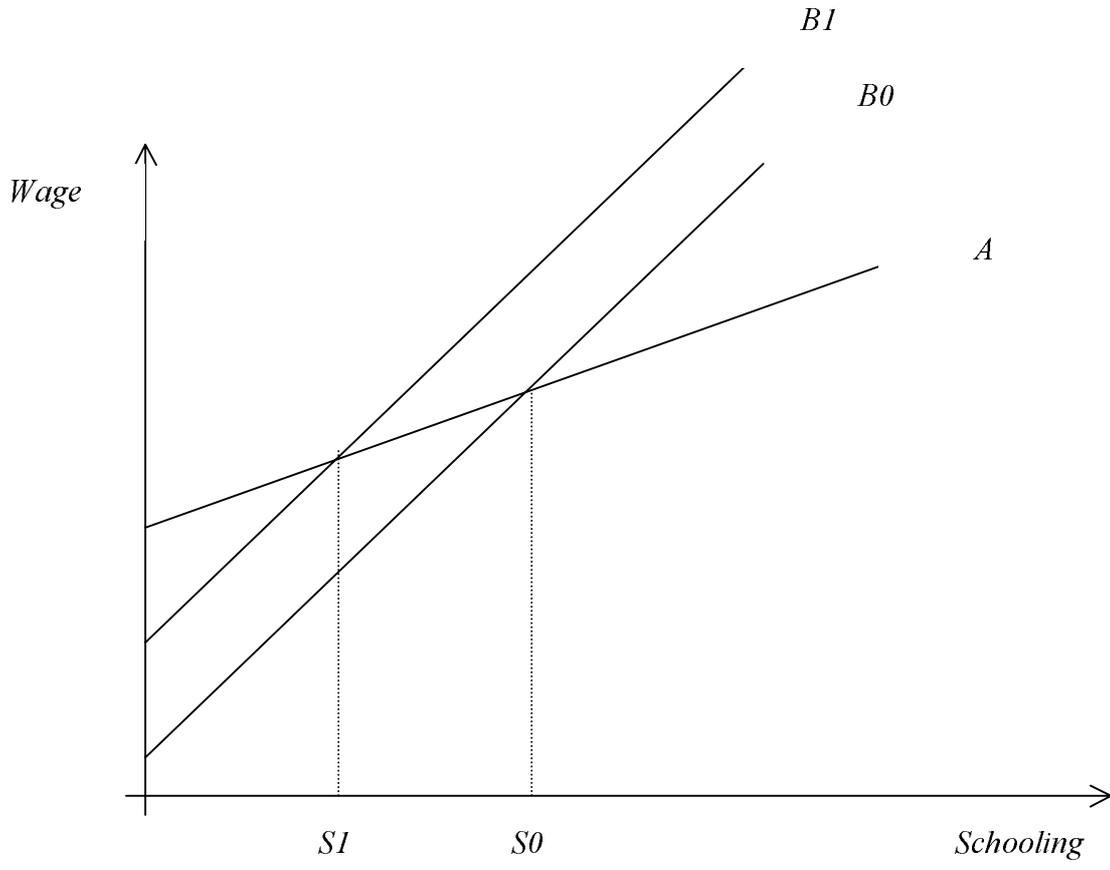


Figure 3: Overall variance.

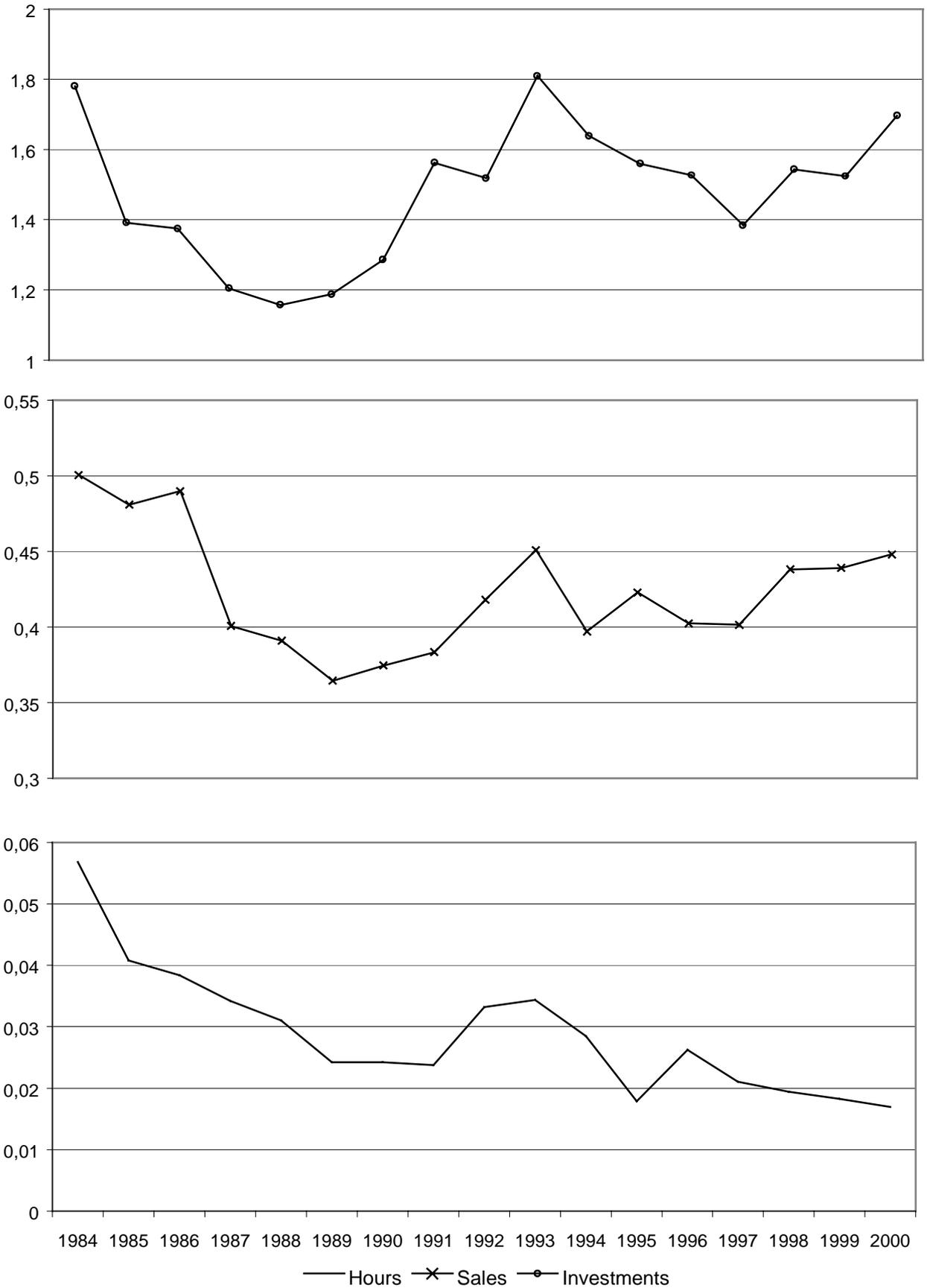
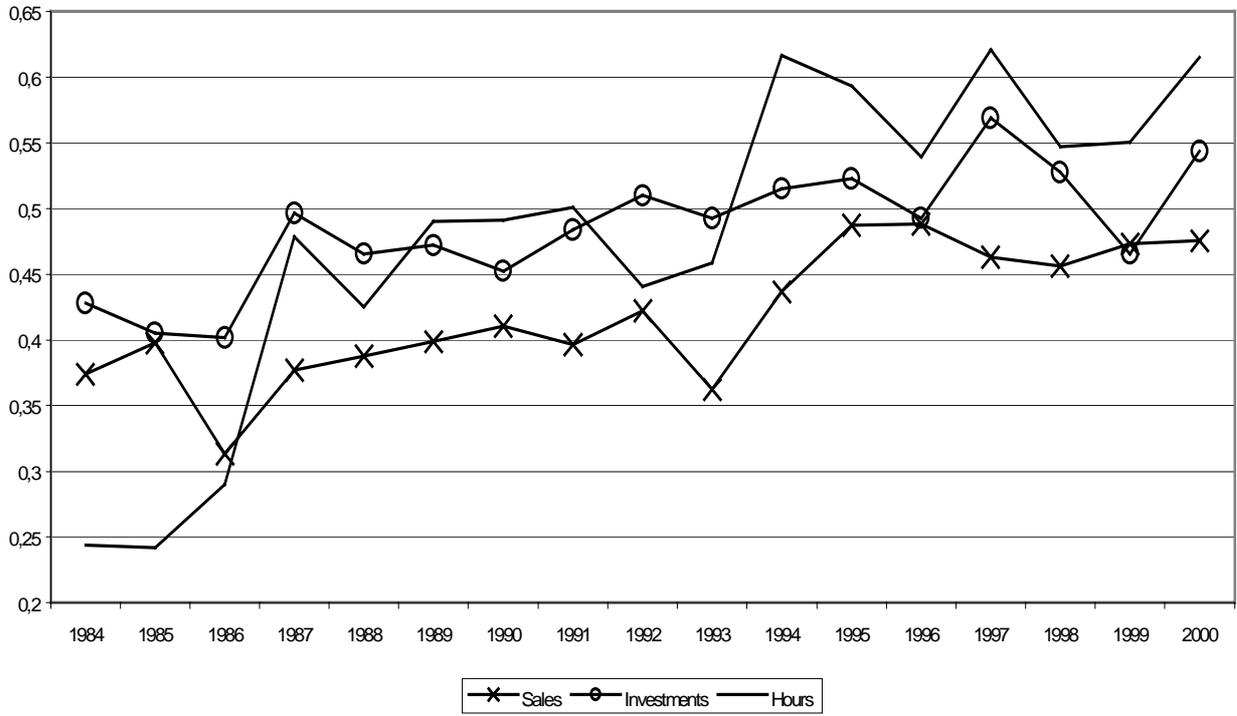


Figure 4: Share of unexplained variance.



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