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Abstract

Using a novel dataset compiled from Japanese health insurance societies covering about 1,500 firms and 15 million employees in total, we examine wage inequality within and between firms. Employing the mean log deviation approach to decompose wage inequality into within-firm and between-firm inequality, we find that it increased among male employees during the period we examined (FY2003-2007). Moreover, even after controlling for changes in the compositional structure of firms' employees, an increase in wage inequality within firms can be observed, greatly contributing to the increase in overall wage inequality, which likely reflects the growing prevalence of performance-based wage systems.

Keywords: Wage inequality; Within-firm inequality; Performance-based wage
JEL classification: J31, D31

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1. Introduction

Economic inequality is an issue that is attracting growing public attention and has become a major focus of political debate worldwide. A considerable number of studies have attempted to measure changes in economic inequality and examine the mechanisms underlying such changes. One of the most important factors in this context are changes in firms' wage systems and numerous researchers have highlighted the increasing prevalence of performance-based wage systems and the role these play in wage inequality (e.g., Lemieux et al. 2009; Tsuru et al. 2005; Uni 2008).

A widely used approach to examine the mechanisms underlying changes in economic inequality has been to employ decomposition analysis. Specifically, following the seminal studies by Shorrocks (1982, 1984) and Mookherjee and Shorrocks (1982), changes in overall inequality are frequently decomposed into changes in within-group inequality and between-group inequality using the mean log deviation (MLD) approach. Using this approach, previous studies examining economic inequality have frequently decomposed inequality by age group. Doing so is particularly useful in understanding how changes in population structure, especially population aging, can play a role in overall economic inequality: since inequality among the elderly tends to be greater than among the young, an increase in the share of the elderly in the population will increase economic inequality overall. For instance, looking at wage inequality in Japan, Ohtake and Saito (1998) and Shinozaki (2006) find that the increase in wage inequality observed during the 1990s is largely due to changes in the age structure of the population rather than changes in inequality within the same age groups.

Studies such as Ohtake and Saito (1998) and Shinozaki (2006) on wage inequality are relatively straightforward to conduct. Information to group employees by their characteristics such as age, gender and academic background is easily obtainable from surveys on employees,[1] and there are a considerable number of studies going back several decades that use employee characteristics for the analysis of wage inequality[2]. In contrast, examining wage inequality within firms is considerably more difficult. In Japan, the only relevant firm-level survey is the *Basic Survey on Wages Structure* (BSWS) by the Ministry of Health, Labour and Welfare (MHLW). However, the sample of employees

[1] For instance, in Japan there are the *Employment Status Survey* and the *Special Survey of the Labor Force Survey* (both conducted by the Ministry of Internal Affairs and Communications) providing such information.

[2] Examples include Blinder (1973), Katz and Revenga (1989), Katz and Murphy (1992), Freeman and Katz (1994), Sasaki and Sakura (2005), Goldin and Katz (2007), and Kawaguchi et al. (2008).

for each firm is very small, making it difficult to reliably measure within-firm wage inequality.

Reflecting this scarcity of adequate data not only in Japan but also elsewhere, most research on the implications of performance-based pay systems for overall wage inequality consists of anecdotal studies based on surveys of specific firms rather than empirical studies based on a comprehensive set of firm-level data spanning a large number of firms. That being said, there are a number of exceptions: studies that attempt to empirically capture inequality within firms using indirect means. Tachibanaki (2006), for example, employing the BSWS, makes inferences about inequality within firms by grouping firms in terms of size and industry, while for the United States, Davis and Haltiwanger (1991) measure within-firm inequality implicitly as the residual between between-firm inequality and inequality overall. The only study that we are aware of that measures within-plant wage inequality explicitly is that by Skans et al. (2007), who construct an "employer-employee dataset using a Swedish database."

In this study, we use a novel dataset compiled by the MHLW from health insurance societies (*kenkou hoken kumiai*) in order to explicitly measure inequality within firms. Details of this dataset will be provided in the next section. Using this huge dataset allows us to capture the wage distribution within each individual firm and we decompose overall wage inequality into within-firm and between-firm inequalities using the MLD approach. The dataset covers about 1,500 firms with a total of about 15 million employees at any particular time during our observation period.[3] No other dataset covers such a large number of employees and this is the first time that this dataset is used for the analysis of inequality. In addition to the large number of employees covered in the dataset, another unique feature is that it makes it possible to measure the wage distribution for each individual firm including *all employees*.

Using this data and the MLD approach, we find the following. Overall inequality increased during the observation period due to an increase in inequality within firms among male employees, which as a result overtook that among female employees. Moreover, even after controlling for changes in the compositional structure of firms' employees, an increase in wage inequality within firms can be observed, which greatly contributes to the increase in overall wage inequality. These findings are consistent with the increasing prevalence of performance-based pay systems in Japan.

The remainder of the paper is organized as follows. The next section provides a

[3] In contrast, the number of observations in the BSWS is approximately 1 million and therefore considerably smaller than the number of insurants in our dataset.

detailed outline of our dataset, while Section 3 explains our methodology. Section 4 then presents our results on changes in wage inequality within and between firms as well as the results of the decomposition of changes in inequality. Finally, Section 5 concludes.

2. Data

The data we use in this paper to measure wage inequality are compiled from Japan's health insurance societies (*kenkou hoken kumiai*, referred to as HIS hereafter), which form part of Japan's mandatory health insurance system.

In Japan, all citizens have to join a health insurance scheme. All workers[4] are insured in the following way. All government workers are insured through the mutual-aid associations (*kyousai kumiai*), while all non-government workers are insured through one of the following three schemes; (a) the scheme managed by the above mentioned HISs (the Society-managed Health Insurance or *kumiai kenpo*), (b) the Association-managed Health Insurance (*kyoukai kenpo*)[5] or (c) the National Health Insurance (*kokuho*).

The type of scheme under which non-government workers are insured depends on the nature of their workplace. If their workplace is a plant of a corporate (*houjin*) firms or, under certain circumstances, a non-corporate firm,[6] employees have to be organized through (a) the Society-managed Health Insurance or (b) the Association-managed Health Insurance. If their firms have established an HIS, the employees are insured through (a) the Society-managed Health Insurance. Otherwise the employees are insured through (b) the Association-managed Health Insurance. Employees falling under one of these schemes are insured through (c) the National Health Insurance. In addition, employers of non-corporate firm are basically insured through (c) the National Health

[4] Part-time workers working more than three quarters of the time of full-time workers can be insured in the same way as full-time workers. Workers earning an annual income of less than 1.3 million yen can be regarded as non-working dependents and are basically insured through the same insurance scheme as their supporting family member. If such employees do not have a supporting family member, they are insured through the National Health Insurance.

[5] The Government-managed Health Insurance and the Seamen's insurance were merged into the Association-managed Health Insurance in October, 2008.

[6] Even if the firm a plant belongs to is not a corporate firm, any plant with five or more employees that does not belong to the food industry, the service industry, or the agriculture, forestry and fisheries industry has to organize either of the two schemes. On the other hand, other plants not obliged to organize one of the two schemes nevertheless can do so voluntarily at the management's discretion.

Insurance.

Firms can establish an HIS if the number of insurants is no less than 700 or in collaboration with other firms if the total number of insurants is no less than 3,000. In both cases, the HIS must be authorized by the MHLW. Due to these requirements, most of those insured though an HIS are employees working for large firms or their group firms.

Based on the Health Insurance Law, all HISs have to submit monthly and yearly reports[7] to the MHLW. The monthly reports include the number of insurants for each wage grade,[8] where each wage grade corresponds to a certain wage bracket (Table 1). This means that, using these HIS reports, which are accessible through a disclosure request to the MHLW, we can measure wage inequality within each HIS.

Table1

In this paper, we assume that each HIS corresponds to a particular firm and use this data to measure wage inequality within each firm. Strictly speaking the "boundaries" of HISs and firms do not always exactly overlap since the way an HIS is organized depends on the firm's management; however, plants of the same firm are usually organized all into the same HIS. Moreover, even when this is the case, HISs are not necessary formed by a single firm. HISs can be formed jointly by firms belonging to the same business group or by several smaller firms typically from the same industry and/or region. They therefore are likely to have similar characteristics, so that we regard the HIS they form as akin to a virtual firm.

Our dataset consists of approximately 1,500 HISs for each period. The data are available from April 2003 to March 2008 (FY2003 to FY2007), because the MHLW did not prepare data in an electronic format before April 2003. We exclude from our dataset HISs that were newly established or dissolved during the observation period; that is, we focus only on HISs that existed through the entire period. Doing so, the number of sample HISs is 1,496 with about 15 million employees[9] in the HISs at any particular time. According to the *Employment Status Survey*, the number of occupied persons was about

[7] These reports are submitted in order for the MHLW to monitor HISs' medical expenses and insurance premiums. In addition to the data on wages, the reports also include information related to medical expenses.

[8] These grades refer to the standard monthly wage class and are based on the previous month's wage excluding bonus payments but including overtime payments. The insurance premium each insurant pays is calculated based on this wage grade.

[9] The number of male insurants is about 10 million and that of female insurants is about 5 million.

55 million. This means that our dataset covers about 27 percent of all employees.[10].

We start our analysis by looking at the wage distribution overall (Figure 1). Specifically, the figure shows the wage distribution of pooled observations in our dataset for the entire observation period. We find that for male employees, the distribution peaks at wage grade 23, which corresponds to a monthly wage of 410,000 yen. On the other hand, for female employees, the distribution peaks at wage grade 14, which corresponds to a monthly wage of 220,000 yen.

Figure 1

3. The MLD approach

This section explains the mean log deviation (MLD) approach, which we use to examine wage inequality. The MLD is defined as follows:

$$MLD = \log(\bar{x}) - \overline{\log(x)}, \quad \cdots\cdots\cdots\cdots\cdots\cdots(1)$$

where $\bar{x} = \sum_{j=1}^{n} x_j / n$, $\overline{\log(x)} = \sum_{j=1}^{n} \log(x_j) / n$ and x_j is the wage of person j.

The MLD approach is useful for decomposing inequality. It can be linearly decomposed into within-group inequality and between-group inequality as follow:

$$MLD = MLD_{in} + MLD_{bet}, \quad \cdots\cdots\cdots\cdots\cdots\cdots(2)$$

where

$$MLD_{in} = \sum_{g=1}^{n_g} \alpha_g \, MLD_g, \quad \cdots\cdots\cdots\cdots\cdots\cdots(3)$$

$$MLD_{bet} = \log(\bar{x}) - \sum_{g=1}^{n_g} \alpha_g \log(\overline{x_g}), \quad \cdots\cdots\cdots\cdots\cdots\cdots(4)$$

α_g is the share of group g in the total population, MLD_g is the internal inequality of group g measured by the MLD approach, and $\overline{x_g}$ is a mean wage of group g. Within-group inequality MLD_{in} is defined as the mean of the each group's internal inequality MLD_g weighted by the population share α_g of group g. On the other hand,

[10] While the number of employees insured through the mutual-aid associations is 4 million and that through the Association-managed Health Insurance is 20 million, it is difficult to establish the number of employees insured through the National Health Insurance since it also contains non-workers.

between-group inequality MLD_{bet} is defined as the weighted difference between the mean wage overall and the mean wage within individual firms.

Next, we turn to changes in inequality over time, say, from time t to $t+\Delta t$. The change in overall inequality ΔMLD is again decomposed into the change in within-group inequality ΔMLD_{in} and the change in between-group inequality ΔMLD_{bet} as follows:

$$\Delta MLD = \Delta MLD_{in} + \Delta MLD_{bet} \quad \cdots\cdots\cdots\cdots\cdots\cdots (5)$$

Note that it is necessary to take into account changes in the compositional structure of the population when examining changes in within-group inequality. Even though inequality within individual groups may remain unchanged, overall within-group inequality may change as a result of changes in the weight of certain groups. That is, an increase in the weight of groups with high internal inequality will lead to a rise in within-group inequality overall.

Then, changes in within-group inequality ΔMLD_{in} are linearly decomposed into the pure effect of change in each group's internal inequality $\sum_{g=1}^{n_g} \overline{\alpha_g}\, \Delta MLD_g$ and the effect of changes in compositional structure $\sum_{g=1}^{n_g} \Delta\alpha_g\, \overline{MLD_g}$ where $\Delta\alpha_g = \alpha_{g,t+\Delta t} - \alpha_{g,t}$,

$\overline{\alpha_g} = (\alpha_{g,t} + \alpha_{g,t+\Delta t})/2$, $\Delta MLD_g = MLD_{g,t+\Delta t} - MLD_{g,t}$ and

$\overline{MLD_g} = (MLD_{g,t} + MLD_{g,t+\Delta t})/2$.

4. Results

4.1 Changes in the wage distribution and inequality overall

We start our examination by looking at changes in the wage distribution and inequality overall. Because the wage distributions based on the monthly HIS reports display seasonality, we construct yearly data by calculating the 12-month average for each observation point. For example, the annual data for 2003 are calculated using data from April 2003 to March 2004.

Figures 2 and 3 show the wage distribution for 2003 as well as the difference between 2003 and 2007 for male and for female employees, respectively. As already seen in Figure 1, the peak for male employees is in wage grade 23, while that for female employees is in grade 14. Next, taking a closer look at Figure 2 and the change in the wage distribution

depicted by the broken line, we find increases in the number of employees on either side of the 2003 peak, suggesting an increase in wage inequality among male employees. On the other hand, in Figure 3 for female employees, the shape of the difference distribution is quite similar to the 2003 distribution, with a small shift to the right. Thus, the figure does not provide any evidence of an in inequality, but instead hints at an increase in wages for female employees.

Next, we examine the changes in wage inequality using inequality indices. Figure 4 depicts the trend in wage inequality from 2003 to 2007 using MLD. As can be seen, inequality among male employees appears to have grown rapidly, while inequality among female employees shows only a minimal increase. As a result, while inequality among male employees was smaller than among female employees in 2003, the reverse was the case in 2007. The same pattern is observed when using the Gini index: while the index increased from 0.2168 to 0.2264 for male employees, it only rose from 0.2236 to 0.2243 for female employees.

Figures 2 to 4

4.2 Inequality within firms

Next, we calculate the inequality index for each individual firm and examine the distribution of the inequality index. In addition, we calculate within-firm inequality overall and examine its trend over time.

Figures 5 and 6 show the distribution of the MLD for individual firms for male and female employees, respectively. Comparing the distributions for 2003 and 2007, we find that for both male and female employees it shifts to the right. In other words, we find that inequality within individual firms tended to increase during this period. Similar patterns can be observed when using Gini indices instead.

Figure 7 shows the change in within-firm inequality using the MLD method. Within-firm inequality is defined as the weighted mean of the inequality measured in individual firms, where firms' share in the overall population of employees is used as weights, as shown in Equation (3). We find that within-firm inequality for male employees is higher than that for female employees. Furthermore, within-firm inequality for male employees increased rapidly during this period.

This change in within-firm inequality overall is due to the change in inequalities within individual firms seen in Figures 5 and 6 and, as will be seen in the next sections, change in the weight of individual firms.

Figures 5 to 7

4.3 Decomposition of overall inequality

The next step is to decompose changes in equality overall into the contribution of changes in within-firm inequality and changes in between-firm inequality. Between-firm inequality is defined as the weighted difference between the mean wage overall and the mean wages within individual firms, as shown in Equation (4). The indices of between-firm inequality for male and female employees are shown in Figure 8. We find that between-firm inequality is higher for female employees than that for male employees. Moreover, a slight increase in between-firm inequality can be observed for male employees, while for female employees it remained essentially unchanged. Again, similar patterns can be found using Gini indices instead.

Figure 8

The contribution of changes in within-firm and between-firm inequality to changes in inequality overall is shown in Figure 9. We find that the contribution of changes in within-firm inequality is substantial, especially for male employees. On the other hand, the contribution of changes in between-firm inequality is also positive for male employees, but considerably smaller, while it is even slightly negative for female employees. Thus, for male employees, the increase in within-firm inequality accounted for 82 percent of the increase in wage inequality overall.

Given that the increase in within-firm inequality is responsible for the lion's share of the increase in inequality overall, we further decompose it into changes in inequality within individual firms and changes in the composition of firms. The results are presented in Figure 10 and show that increases in inequality within individual firms make a large positive contribution to within-firm inequality overall. On the other hand, while the contribution of changes in the composition of firms is positive for male employees, thereby further exacerbating overall within-firm inequality, it is negative for female employees, thus offsetting to a great extent the role of increases in inequality within individual firms. The results imply that the share of men working for firms with relatively large internal inequality has increased, while the share of women working for firms where internal inequality is relatively small has grown.

Finally, we also decompose changes in between-firm inequality into the contribution of changes in differentials between firms' mean wages and changes in firms' weights. The

results are shown in Figure 11 and indicate that, both for male and for female employees, differentials in firms' mean wages made a negative contribution and compositional changes a positive contribution. In other words, the means of firms' wages were converging during the observation period, but at the same time an increasing number of employees were working for firms paying wages that were considerably higher or lower than the mean.

Figures 9 to 11

The main reason for these diverging trends in the role of the composition of firms most likely is the large increase in the number of insurants, especially female insurants, registered with the HIS of temp agencies (*jinzai haken kenko hoken kumiai*), for both changes in within-firm and between-firm inequalities. Internal inequality in the HIS of temp agencies is relatively small for female employees, but relatively large for male employees, while mean wages are considerably lower than the overall means for both male and female employees.

4.4 Changes in the age structure of firms' employee

The discussion so far has ignored the effects of changes in the age structure of the population. As highlighted in previous studies that decompose overall inequality by age group, the growing share of elderly employees is one potential reason for the increase in within-firm inequality. That is, because inequality among older employees tends to be larger than among younger employees within individual firms, an increase in share of older employees will lead to a rise in equality, even if within-age group inequality in individual firms remains unchanged.

In contrast with the employment surveys typically used in preceding studies, our data are available on a firm-level basis only, and we therefore do not have information about the characteristics of individual employees such as their age. However we do have some information on the employees' age, namely the mean age of employees at an individual firm, which is included in the yearly HIS reports and which allows us to examine the aging of employees. Looking at this information indicates that, in 68% of firms mean age of male employees and in 85% of the mean age of female employees increased during the observation period. We therefore examine whether the increase in within-firm inequality is related to the aging of employees. We do so by calculating the correlation between changes in within-firm inequality and employees' mean age. By doing so, slightly negative correlation (-0.07) is observed for male employee and the positive correlation

(0.11) is observed for female employees. Focusing on male employees, this result suggests there are factors other than changes in the age structure of employee that is responsible for increase in within-firm inequality.

4.5 Bonus payments

It is often said that the bonus system plays an important role in the introduction of performance-based pay (e.g., Lemieux et al. 2009; Tsuru et al. 2005). In fact, the wage grades that we use in the analysis here to examine wage inequality do not include bonuses. If performance-based pay is likely introduced through the bonus system, the wage inequality that we measure here may be biased downward. Therefore, the actual increase in firm-internal wage inequality might be even more pronounced than the result here suggested if bonus payments were included. What is more, since the focus here is on monthly wages rather than bonus payments, the analysis suggests that the increase in firm-internal wage inequality is not a temporary phenomenon (e.g., due to inflated bonus payments) but reflects a longer-term trend.

4.6 Business cycle

It has long been said that wage inequality is strongly related with business cycle. Conventionally, wage inequality is thought to rise during recession and this countercyclical earning volatility recently plays an important role in solving some macroeconomic puzzles. Although the countercyclical earning volatility is the important basis of economic theory, the question how wage inequality related with business cycle is controversial (e.g. Goldin and Margo 1992; Barlevy and Tsiddon 2006).

The observation period of our analysis is in economic recovery period. In order to identify the effect of business cycle on within-firm wage inequality, we divide the firms into two groups, i.e. one is constituted from firms in good performance and the other is from those in bad performance. Each firm's performance is measured using ratio of sum of bonus payments compared with sum of monthly base wage payments. If the ratio grows, we regard that the firm is in good performance. If the ratio shrinks, we regard that the firm is in bad performance. We find that firm's internal wage inequality tends to grow for both two firm groups.

5. Conclusion

This paper examined changes in within-firm and between-firm inequality in wages using

data from health insurance societies for the period from FY2003 to FY2007. Wage inequality was measured using the mean log deviation (MLD) approach, where inequality overall is decomposed into within-firm and between-firm inequality.

The main finding of this paper is that within-firm inequality increased greatly during the period studied and contributed substantially to the change in inequality overall, even after controlling for changes in the weighting of firms. Specifically, it was found that inequality overall grew rapidly among male employees and overtook that among female employees, which remained more or less unchanged. In contrary with earlier studies showing that overall inequality increased due to the growing share of elderly employee, we found that firms in which internal inequality increased did not necessarily have an aging workforce. That is, even after taking employees' aging into account, we still find an increase in firm-internal inequality, suggesting that the greater prevalence of performance-based pay schemes rather than any composition effects are responsible for the observed increase in wage inequality.

Other notable findings are as follows. Comparing male and female employees, we find that within-firm inequality is higher for male than that for female employees, while the reverse is the case for between-firm inequality. A likely explanation for these results is that, compared with male wages, female wages are less determined by performance within the firm and instead to a large extent depend on which firm women works for. Furthermore, despite the increase in firm-internal inequality, we find a decrease in the differentials between the means of firms' wages both for male and female employees, which suggests that the degree to which employees' wage depends on their performance within the firm, rather than which firm they work for, is increasing.

Another finding is that the rise of temp agencies during the 2000s, through the growing share in employment they account for, has had a considerable and interesting impact on inequality. While firm-internal wage inequality among female employees at temp agencies is relatively small, that among male employees is relatively large. As a result, the increasing weight of temp agencies has a negative (compressing) effect on inequality among female employees, but a positive (enlarging) effect on inequality among male employees. Furthermore, mean wages at temp agencies are relatively low both for male and female employees, so that the increase in the share of employees working at temp agencies has a positive (enlarging) effect on between-firm wage inequality, which is defines as weighted difference between the mean wage overall and the mean wage within individual firms.

While our research has produced interesting new insights on developments in wage inequality within firms in Japan, much remains to be explored. One important issue, for example, is the relationship between changes in wage inequality within firms and firm characteristics such as their performance. If we assume that the observed increase in within-firm inequality is the result of the adoption of performance-based pay, we need to clarify under what circumstances firms adopt performance-based pay and how this affects firm performance.

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Table 1. Wage grades

Grade	Standard monthly wage (in yen)	Monthly wage bracket (in yen)
1	98,000	Up to 101,000
2	104,000	101,000–107,000
3	110,000	107,000–114,000
4	118,000	114,000–122,000
5	126,000	122,000–130,000
6	134,000	130,000–138,000
7	142,000	138,000–146,000
8	150,000	146,000–155,000
9	160,000	155,000–165,000
10	170,000	165,000–175,000
11	180,000	175,000–185,000
12	190,000	185,000–195,000
13	200,000	195,000–210,000
14	220,000	210,000–230,000
15	240,000	230,000–250,000
16	260,000	250,000–270,000
17	280,000	270,000–290,000
18	300,000	290,000–310,000
19	320,000	310,000–330,000
20	340,000	330,000–350,000
21	360,000	350,000–370,000
22	380,000	370,000–395,000
23	410,000	395,000–425,000
24	440,000	425,000–455,000
25	470,000	455,000–485,000
26	500,000	485,000–515,000
27	530,000	515,000–545,000
28	560,000	545,000–575,000
29	590,000	575,000–605,000
30	620,000	605,000–635,000
31	650,000	635,000–665,000
32	680,000	665,000–695,000
33	710,000	695,000–730,000
34	750,000	730,000–770,000
35	790,000	770,000–810,000
36	830,000	810,000–855,000
37	880,000	855,000–905,000
38	930,000	905,000–955,000
39	980,000	955,000 and over

Note: This table applies up to March 2007. From April 2007, the number of grades increased to 47. Specifically, grades 1 and 39 were each subdivided into five grades. In the analysis in the paper, however, we combined these grades again to be able to make comparisons between 2003 and 2007.

Figure 1. Wage distribution by standard monthly wage grade

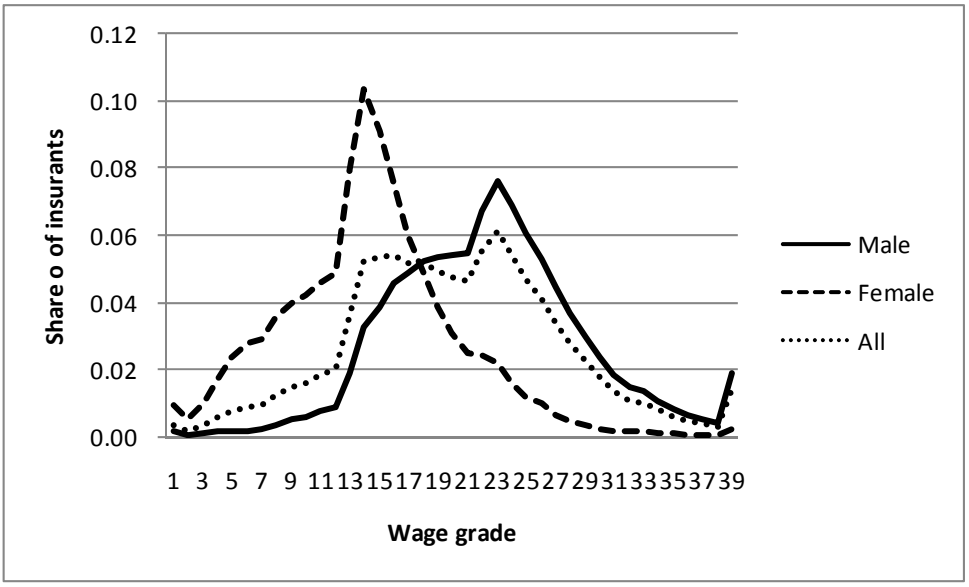

Figure 2. Change in wage distribution for male employees

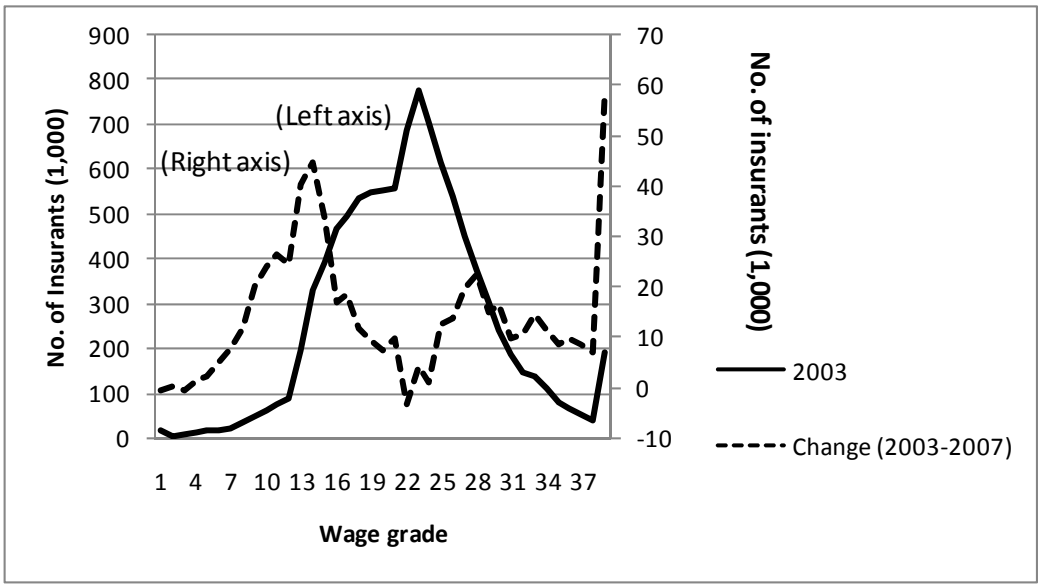

Figure 3. Change in wage distribution for female employees

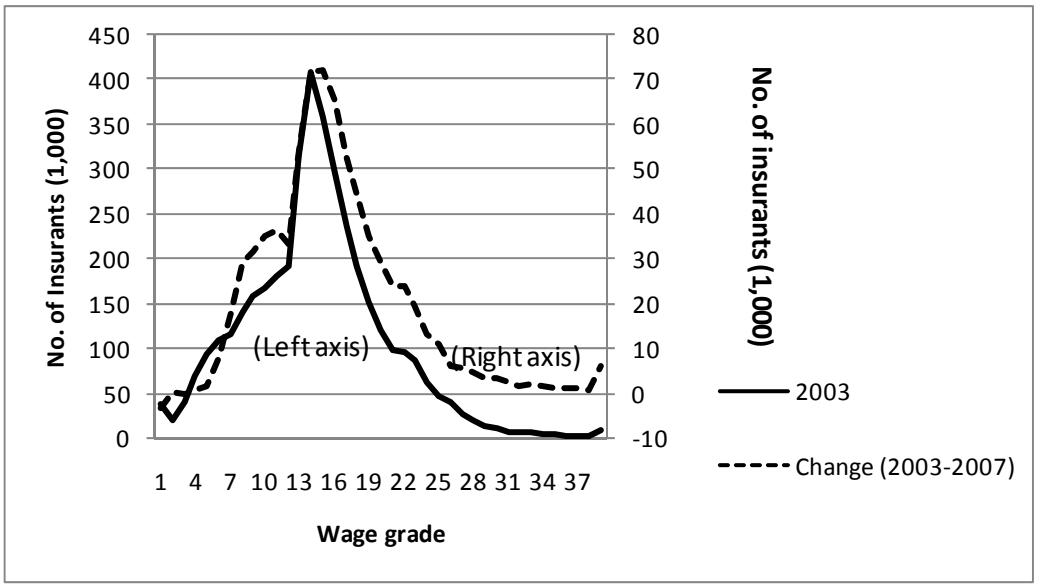

Figure 4. Change in wage inequality (MLD)

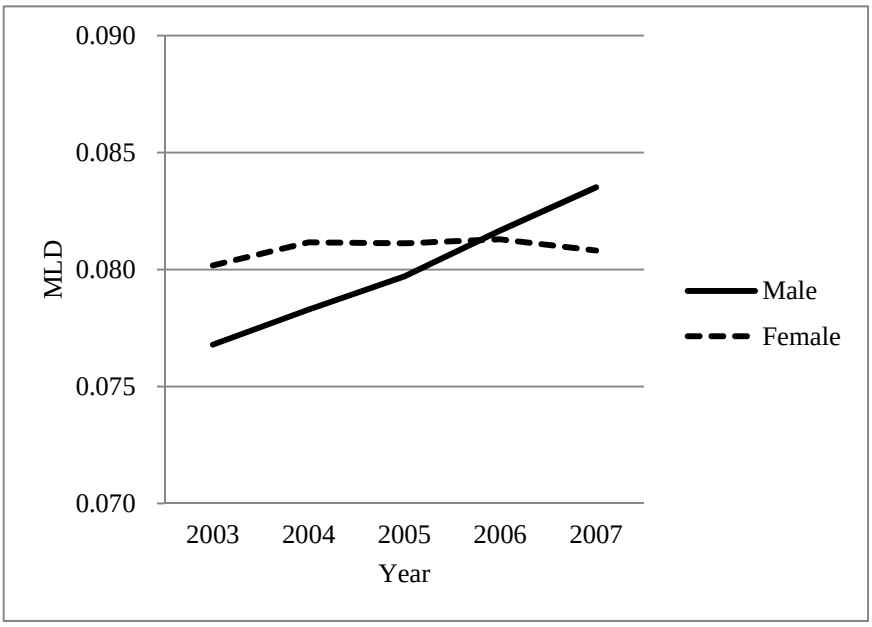

Figure 5. Distribution of MLD for male employees

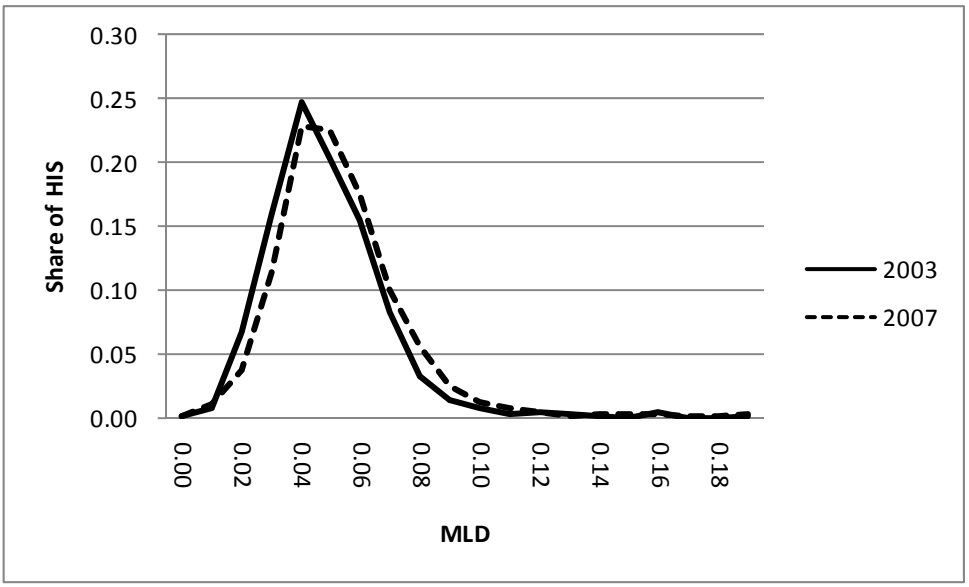

Figure 6. Distribution of MLD for female employees

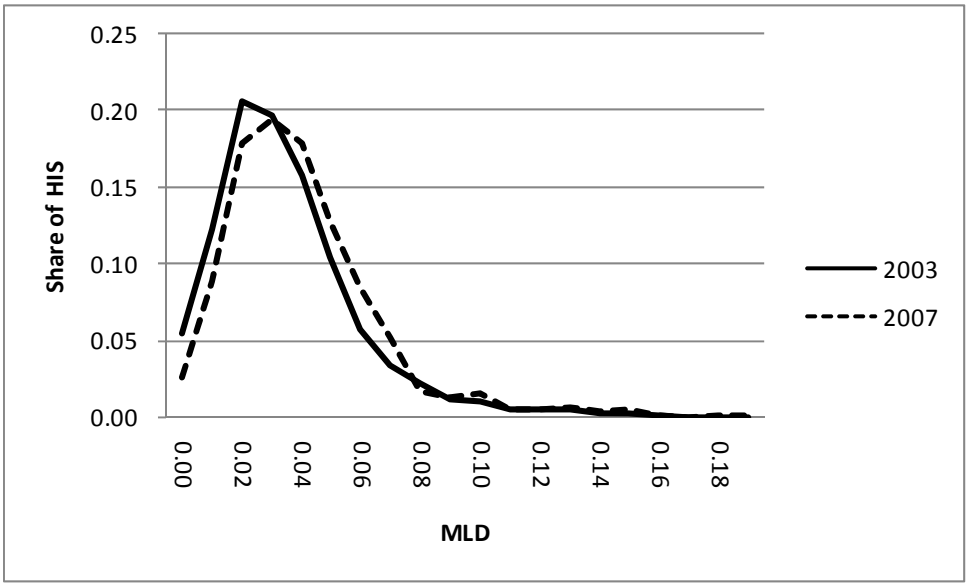

Figure 7. Change in within-firm MLD

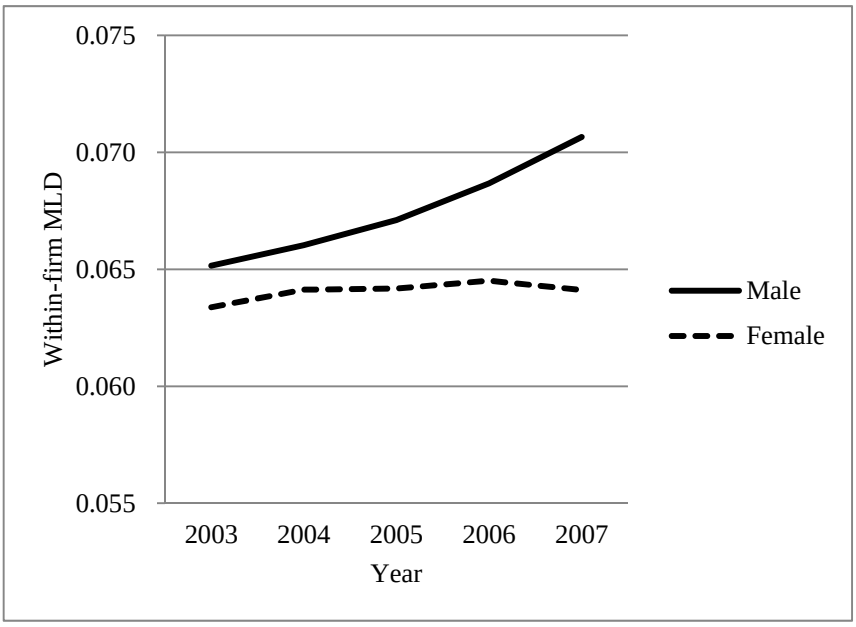

Figure 8. Change in between-firm MLD

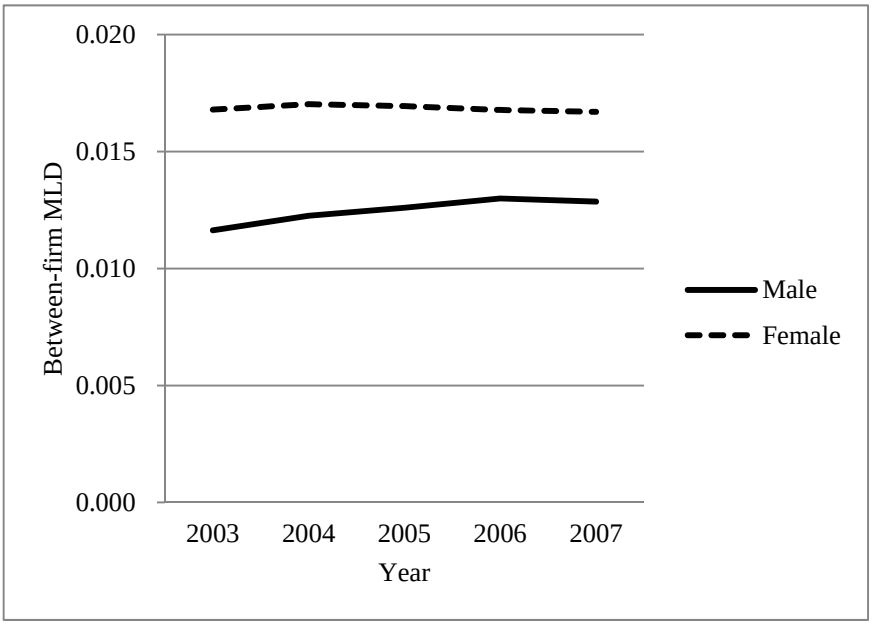

Figure 9. Decomposition of changes (2003-2007) in overall inequality

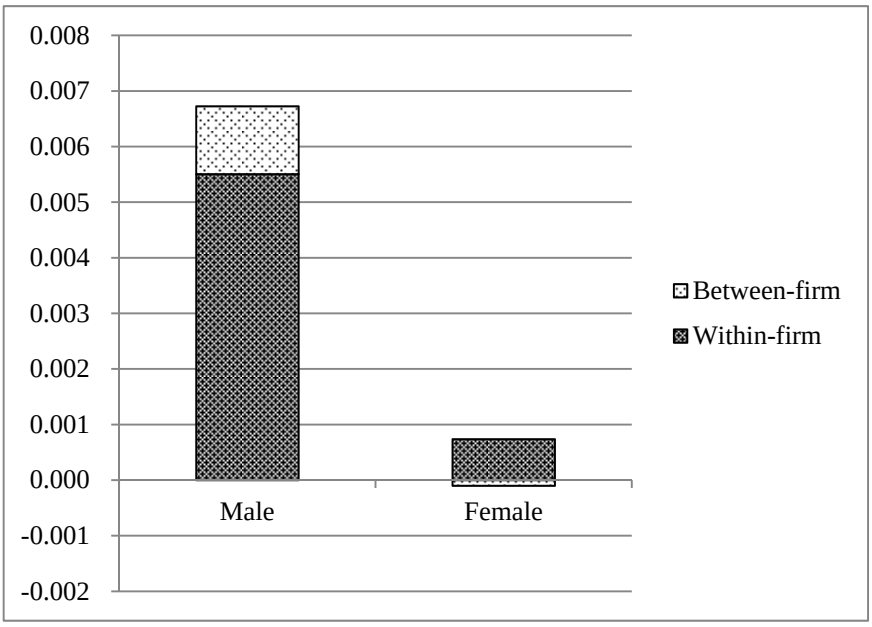

Figure 10. Decomposition of changes (2003-2007) in within-firm inequality

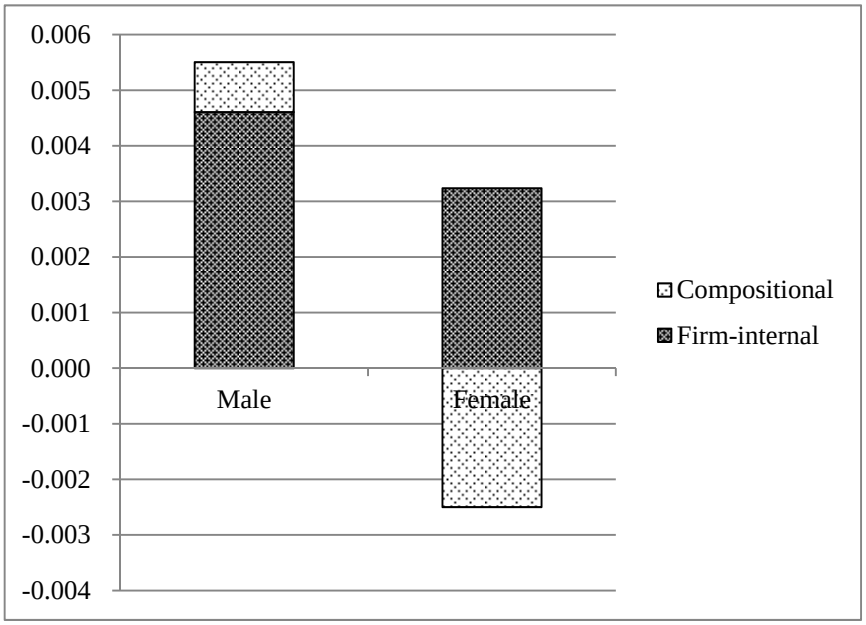

Figure 11. Decomposition of changes (2003-2007) in between-firm inequality