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Changing Wage distributions and the Evolution of Wage Inequality in Indonesia: 1994-2007

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Abstract: This paper investigates the developments in wage inequality in Indonesia from 1994 to 2007. Wage changes are decomposed at the mean as well along the wage distribution. In earlier years, the substantial growth in the earnings of workers was accompanied by moderately declining earnings inequality, a development driven by the effect of coefficients ("prices"). However, in recent years, wage inequality increased substantially. These results are attributed to the effect of coefficients which increased sharply at higher deciles of the earnings distribution. Changes in wage inequality over the period examined are related to developments in the real minimum wage over time, the effects of the 1997-98 financial crisis and increases in the return to skill in recent years.

JEL codes: D33, J31, J42
Keywords: Wage inequality, counterfactual decompositions, Indonesia.

1. Introduction

The impact of economic growth, increased mobility of skilled labor and technology on income inequality has been of concern, especially whether economic growth has been pro-poor in developing countries. Comparison of earnings distributions have been conducted in various settings, such as between time periods, across countries or regions and between men and women. Such studies rely mostly on the Oaxaca-Blinder decomposition or its subsequent extensions. One of the pioneering studies is the one by Juhn *et. al.* (1993), which found a general rise in the return to skill over the 1970s and 1980s in the United States as a result of an increase in the demand for skill, led to subsequent debates on the role of the increasing demand for skilled workers on earnings inequality[1]. Availability of new decomposition methods resulted in a number of studies, not only for the United States and other developed countries but also for developing and transition countries. Further advances in the methodology of counterfactual decompositions of changes in wage distributions came, among others, from Fields (2003), Machado and Mata (2005) and Melly (2005).

There is a proliferation of studies for transition economies (for example Lukyanova, 2006 for Russia; Ganguli and Terrell, 2005 for Ukraine), some studies for developing countries (for example Gindling and Trejos, 2005 for Costa Rica; Dutta, 2005 for India; Chi *et. al.* 2007, Knight and Song, 2003, Meng, 2004, Wan and Zhou, 2005 and Gustafsson and Li, 2001, among others for China)[2] and Newly Industrialized Economies (for example Park, 2000; Fields and Yoo, 2000 and Kang and Yun, 2008 for Korea; Bourguignon *et. al.*, 2001 for Taiwan), as well as a few studies (mostly for Latin American countries) examining the link between trade openness and wage inequality (for example Attanasio *et. al*., 2004). However, there is a scarcity of evidence from South East Asia's developing economies.

Indonesia enjoyed a period of strong growth from the 1960s onwards, which was supported by human resource and infrastructure development, a protected manufacturing

sector and booming oil prices. During this period, labor markets were highly flexible with weak trade unions and high labor mobility in response to changes in labor demand.[3] Between 1986 and the mid-1990s, employment growth in agriculture declined, urban employment grew strongly and real wages rose rapidly. In the 1990s, signs of labor regulation appear in the form of minimum wages (which rose by almost 100% over a five-year period) and social security, especially in the modern sector. Following Indonesia's economic crisis of 1997-98 the pattern of real wage increases reversed and by 1998 the declines in real wages were dramatic, especially in manufacturing. Data from the National Labor Force Surveys (Sakernas) from the turn of the century to 2007 indicate that the growth of wages was small especially for men.

Past studies on Indonesia which relate to aspects of inequality include that of Suryadarma *et. al.* (2006), who looked at regional and ethnic inequality and in particular, access to education and outcomes, health facilities, voice, as well as income and consumption. Relatively more researched is the impact of the economic crisis on family income and consumption inequality and evidence exists that inequality decreased during the crisis period, following increases during the preceding growth period; however, for households below the poverty line, inequality actually increased in rural areas but decreased in urban areas (see for example, Said and Widyadi, 2002; Skoufias *et. al.* 2000). Finally, Alatas and Bourguignon (2005) used Oaxaca-Blinder decomposition methodology to look at changes in inequality within the 1980-1996 period and found a relatively small increase in inequality.

In this paper I analyze the changes in inequality for wage employees. Wage employment in Indonesia accounted for about 30 percent of total employment and half of all jobs outside agriculture. I use data from the Sakernas surveys from 1994 to 2007 and divide the time period into two intervals, from 1994 to 2001 and from 2001 to 2007 to investigate

the changing wage distributions in the two periods, the changing wage inequality across the earnings distribution and the relative contribution to these changes of endowments of earnings generating characteristics (such as skills) and the reward ("price") of such characteristics by conducting counterfactual decompositions.

2. Data and Methodology

National Labor Force Surveys (Sakernas) data for 1994, 2001 and 2007 are used, covering all employees 15-65 years of age, except casual workers in agriculture and family workers. The dependent variable is the logarithm of the hourly wage, inflated to 2007 prices using the within province CPI. The explanatory variables in the earnings functions for the purpose of deriving decompositions at the mean as well as conducting counterfactual decompositions include personal characteristics, level of education, occupation, broad industry affiliation and region of residence.

Table A1 in the appendix presents the mean characteristics of workers by year and gender. Mean earnings increased rapidly between 1994 and 2001 and moderately between 2001 and 2007. Female earnings exhibit a significantly larger increase over both time periods and more so between 1994 and 2001. Between 1994 and 2001, the proportion of workers in urban areas increased by about one-third for both men and women. Over the same period, employment in agriculture decreased significantly, especially for women. Over the entire period, the proportion of women with tertiary qualification increased by more than 250 percent, compared to about 120 percent for men.

In decomposing the changes in hourly wage at the mean, I use the Oaxaca-Blinder decomposition method. Suppose that $\mathbf{t_1}$ and $\mathbf{t_2}$ are any two years. $\mathbf{W_1}$ and $\mathbf{W_2}$ are the average earnings and $\mathbf{X_1}$ and $\mathbf{X_2}$ are the average characteristics of workers in the two years, while $\mathbf{b_1}$ and $\mathbf{b_2}$ are the vectors of returns to the characteristics derived from earnings functions. Consider the counterfactual earnings where workers' characteristics are the same as those in

year 2, while the return to those characteristics are those at year 1; then the change in average earnings from year $\mathbf{t_1}$ to year $\mathbf{t_2}$ can be decomposed as follows:

$$W_2 - W_1 = b_1(X_2 - X_1) + X_2(b_2 - b_1) \qquad (1)$$

where the first term on the right-hand side denotes the changes in mean earnings attributed to changes in worker characteristics (composition effect), while the second term denotes the changes attributed to the return to workers' characteristics (effect of "prices" or "wage structure effect"). A problem with the Oaxaca-Blinder method is that one has to decide which set of coefficients to use in evaluating differences in characteristics. In performing decompositions at the mean I'll be using the coefficients from a pooled model over both year-groups as the reference coefficients.[4]

While the above decomposition methodology does not allow decompositions of statistics other than the mean, extensions of the above methodology allow decompositions applied to the entire earnings distribution using quantile regressions (Koenker and Bassett, 1978). Some of the methods that have been used include those proposed by Lemieux (2002), Firpo, Fortin and Lemieux (2005), Machado and Mata (2005), Gosling *et. al.* (2000) and Melly (2005; 2006). The Machado and Mata (MM) simulation based method has been widely used, especially in gender earnings differentials studies; their method involves conditional quantile regression estimation and resampling. The underlying idea is based on the probability integral transformation theorem. Melly (2006) developed further parametric and semi-parametric procedures of estimating unconditional distributions in the presence of covariates, which allows simulating counterfactual quantiles, that can be used to estimate differences in distribution. The estimator is more precise than the sample quantile estimator, which can be used only to estimate observed distributions. An advantage of Melly's estimator is that it is an analytical estimator, which makes computation less onerous

especially when sample sizes are large; furthermore, asymptotic results are provided. I'll be using Melly's estimator in decomposing the unconditional wage changes over time.

The decomposition of the difference between the θ^{th} quantile of the unconditional distribution of the two groups is given by:

$$\hat{Q}_\theta(\ln W_2) - \hat{Q}_\theta(\ln W_1) = [\hat{Q}_\theta(\ln W_2) - \hat{Q}_\theta(\ln W_c)] + [\hat{Q}_\theta(\ln W_c) - \hat{Q}_\theta(\ln W_1)] \qquad (2)$$

where:

$$\hat{Q}_\theta(\ln W_2) = \inf\{\ln W: n_2^{-1} \sum_{i:t=2} \hat{F}_2(\ln W|X_i) \geq \theta\}$$

$$\hat{Q}_\theta(\ln W_1) = \inf\{\ln W: n_1^{-1} \sum_{i:t=1} \hat{F}_1(\ln W|X_i) \geq \theta\}$$

$$\hat{Q}_\theta(\ln W_c) = \inf\{\ln W: n_2^{-1} \sum_{i:t=2} \hat{F}_2(\ln W|X_i) \geq \theta\},$$

while $\hat{F}_t(\ln W|X_i)$ $(t \in \{1, 2\})$ is the estimator of the conditional distribution of group t's ln W conditional on X_i. The first bracket in equation (2) represents the effect of coefficients and the second the effect of characteristics. In particular, the counterfactual unconditional distributions involved are (i) the year 1 log-wage density function that would arise if year 1 wage earners had the same characteristics as their year 2 counterparts (first bracket in equation 2) and (ii) the density function that would arise if the year 2 wage earners had the same returns to characteristics as the year 1 workers (second bracket in equation 2).

3. Decompositions at the Mean

Decompositions at the mean are based on two alternative specifications of earnings equations. In the first, a detailed vector of characteristics is used which includes a gender dummy (when applicable), marital status dummy, urban dummy (when applicable), experience and its square[5], education level, occupation, broad industry and region dummies.[6] Although detailed results were derived, the presented results are after pooling the corresponding coefficients for the 4 sets of dummy variables in the specification. In the second specification I replace education and occupation dummies with level of skill dummies. Workers' skills are distinguished in 3 levels: Skill level 3 (unskilled), skill level 2

(semi-skilled) and skill level 1 (skilled). The purpose of this exercise is to focus on the effects of changes in skill endowments and the reward of skills on earnings growth.

In Tables 1, 2 and 3 the change in the logarithm of hourly wage is decomposed for all employees and by gender. Since dummy variables are used, results should be interpreted in relation to the omitted groups and keeping in mind that the constant reflects the average effect of the omitted group (secondary general education, manual labor, primary sector and Eastern Indonesia).

[Table 1 goes here]

Growth of earnings over the two sub-periods is significantly different. Between 1994 and 2001, on the logarithmic scale, average earnings of all employees increased by 0.298 points, which in geometric means amounts to 4,061 Rupia per hour in 2001 compared to 3,013 in 1994 at 2007 prices (Table 2). This amounts to an increase of 34.8 percent in the mean hourly wage. The substantial increase in mean earnings is, however, unevenly distributed between urban and rural areas and in favor of rural areas.

A little more than 50 percent of this increase is accounted for by the change in characteristics, while the remaining is attributed to changes in the prices of these characteristics. The average increase in earnings is significantly higher for women (nearly 48 percent) compared to the increase in the earnings of men (about 30 percent). The main contributor to the effect of characteristics is education, reflecting the significant increase in education attainments and this is more so for women. With respect to contributors to the effect of "prices", increases in the return to more skilled occupations as well as increases in the difficult to interpret "other" effects for men, and increases in the return to being employed outside the primary sector for women contributed to the increase in earnings; on the other hand the negative coefficient effect for region of employment for men conceals

opposing effects between urban and rural areas (see Table 3). During the same period, the "price" effect of gender moved in favor of women.

[Table 2 goes here]

[Table 3 goes here]

In the second period (2001-2007) the overall increase in mean earnings (shown in Table 2) was small at about 3.6 percent (4,194 vs. 4,049 Rupia) and even smaller for men, an insignificant 1.7 percent (4,538 vs. 4,461 Rupia); on the other hand, the corresponding increase for women was more substantial at about 8 percent (3,558 vs. 3,289 Rupia). The contribution of changes in characteristics was driven by increasing education attainment, especially in the case of women. The effect of changes in "prices" is dominated by developments in the reward of skilled occupations, contributing to increases in earnings. The large negative effect of major industry affiliation reflects decreases in the reward of being employed in industry and services (compared to the primary sector), especially in urban areas. Finally, the negative effect of region (with Eastern Indonesia the comparison group), as in the first period, mainly applies in rural areas.

Table 4 gives the results from the specification in which education and occupation dummies were combined to construct 3 levels of skill in order to understand more clearly changes in the effect of endowment and reward of skill over time. Although there is an element of arbitrariness in such a classification, skills were categorized so that, for example, workers in professional or managerial occupations *or* with university education are assigned to skill 1, while unskilled laborers *or* workers with less than completed primary education are assigned to skill 3 (unskilled)[7]. Care is taken to resolve the few inconsistencies encountered, for example professionals with primary or less education, etc.

[Table 4 goes here]

Between 1994 and 2001, the effect of skill is associated with increases in the endowment of higher skills (skill 1) and in the case of women this is the overriding contributor to the increase in earnings. In the case of men, increases in the "price" of both levels of skill are also important contributors. Between 2001 and 2007, the main effect associated with skill is the significant increase in the reward of skill, especially for semi-skilled workers and much more so for women. Thus, in recent years we observe an increase in the return to skill in Indonesia.

4. Changes in Wage Inequality

One way to characterize inequality is to compute various summary measures of inequality. Table 5 presents such measures, which point to a moderate decrease in inequality in Indonesia during the first period (1994 to 2001), followed by a sharp increase in the recent period (2001 to 2007)[8]. However, the observed differences between the various measures reflect their sensitivity to different statistical assumptions. Percentile ratios and their changes suggest that the moderate decrease in overall inequality between 1994 and 2001 reflected in the various measures of inequality is due to developments at the bottom half of the wage distribution. Otherwise, inequality within the top half of the distribution seems to have slightly increased.

[Table 5 goes here]

More useful and interesting are the findings derived from counterfactual decompositions across earnings distributions which, while confirming an increase in earnings inequality in Indonesia in the more recent period, they also provide more information on wage growth and its constituent sources across the wage distribution.

The decomposition results are given for deciles 1 to 9 in earnings distributions. The reported results include the total wage change and the two components by decile.[9] Table 6 gives the results of the decompositions for all employees by time period. Table 7 gives the

corresponding results by gender, while Table 8 gives the results in urban and rural areas. Looking at the total wage growth by decile, the first observation is that in the first period, the substantial growth in the earnings of workers has contributed to moderately reducing earnings inequality (column 1 in Table 6). Although the effect of the change in the distribution of earnings generating characteristics moderately increases at higher points of the earnings distribution, the effect of coefficients ("prices") is strongly in favor of low earners (columns 2 and 3 in Table 6).

[Table 6 goes here]

In the second period, the picture changes drastically. While the median increase in earnings is a modest 0.066 in logarithmic terms, workers at the bottom 20 percent of the earnings distribution experienced a decline in earnings over the 7-year period. During the same period, earnings of workers at the top of the earnings distribution increased by 0.13 log-points, a substantial increase. The exclusive contributor to these developments has been the changes in the return to characteristics which increased sharply at higher deciles of the earnings distribution (see also graph A2b in the Appendix). These developments point to a drastic increase in earnings inequality among wage earners in Indonesia over the last several years.

[Table 7 goes here]

[Table 8 goes here]

Decompositions by gender (Table 7) for the first period confirm the neutral composition effect for both genders, while the effect of "prices" is equalizing for men and neutral for women. The results for the second period suggest that the increase in wage inequality is particularly severe for men, driven by the effect of "prices". For women, we observe two opposing effects, an equalizing composition effect and a dominant opposite

effect of "prices", resulting in the growth of earnings increasing sharply as one goes to higher earnings deciles. In particular, the endowment of earnings generating characteristics increased significantly for those at the bottom of the female earnings distribution, however, the reward of these characteristics decreased even more over time. Finally, results by urban/rural employment are also of interest (Table 8). In the first period, while the earnings growth in urban areas decreased sharply across the earnings distribution, the opposite was the case for rural areas in which earnings growth had been accompanied by moderately increasing inequality. In the more recent period, the increase in earnings inequality reflects developments in the "prices" of characteristics. In rural areas, while the effect of the change in the distribution of characteristics had an equalizing effect, the opposite effect of the change in the "prices" of characteristics dominates, resulting in an increase in wage inequality.

Developments in the real minimum wage over time and the 1997-98 financial crisis are closely linked to the developments in wage inequality. The minimum wage in Indonesia, introduced in the early 1990s, has been set on the basis of a cost of living indicator (*Kehidupan Hidup Minimum*). Before 2001 it was set nationally by the central government. Since 2001, the level of the minimum wage is calculated by the local governments and proposed to provincial governments.

Until the early 1990s, the minimum wage was set at modest levels. However, subsequently minimum wages rose by about 100 percent over a five-year period in real terms. Until 1993, real minimum wage growth was at or below growth in labor productivity (Graph 1). Post-1993, real minimum wage increases substantially outpaced labor productivity, until the financial crisis. Average real wages (using the real hourly wage from the Sakernas surveys), on the other hand, exhibited only moderate increases which were smaller than gains in overall labor productivity. Following the financial crisis, sharp

increases in the inflation rate resulted in a sharp drop in the real minimum wage which was steeper than the decrease in real average wages. The second period of steep increases in the real minimum wage was from 2000 to 2003, when these increases again outpaced productivity growth. By 2003-2004, the ratio of minimum to median wage reached about 65 percent, compared to about 45 percent on average for OECD countries (OECD 2008). During the 1998-2001 period and following the crisis years, increases in the real earnings of workers at the 90th percentile as well as the real earnings of the average worker outpaced the corresponding increases in the real minimum wage. Overall, over the entire period, increases in the average real wage for workers in the middle as well as the top of the distribution remained below the corresponding increases in the real minimum wage and labor productivity.

[Graph 1 goes here]

[Graph 2 goes here]

Graph 2 depicts the changes in 3 measures of inequality: the Gini coefficient, Theil's measure of inequality and the Standard Deviation of Logs from 1991 to 2007, derived form the Sakernas datasets. All 3 indices agree that wage iequality decreased until the mid-1990s, followed by an increase during the crisis years of 1997-1998, decreasing thereafter. However, during the 2006-2007 period these indices register sharp increases and by 2007 inequality measures are at levels not seen since 1993.

While changes in the minimum wage can affect the bottom of the wage distribution, changes in the return to skill over time contribute to changes in wage inequality. Graph 3 converts to indices the changes in the stock of skilled workers, using the proportion of wage employees with tertiary qualifications (including Diplomas), as well as estimates of the return to skill over time. From 1995 to 2001, the return to skill remained approximately stable in the presence of inceasing endowments of skill in wage employment. After a further

increase in skill endowments in 2001 and beyond, the return to skill declined in the sunsequent years, sugggesting an excess supply of educatred workers. However, after 2005 signs of an excess demand for skill appear and by 2007, the estimate of the return to skill is at 1993-94 highs.

[Graph 3 goes here]

[Graph 4 goes here]

Graph 4 combines indices for the change in the return to skill with changes in the real minimum wage index, along with 3 inequality indices: Gini, Theil and the p90/p10 percentile ratio. Two alternative measures of skill were derived using the Sakernas datasets: in the first, skilled workers are defined as those with tertiary education, while the second includes those with completed secondary education. There is a substantial co-movement of the two indices over time, and graphs 3 and 4 include only the first. During the early 1990s and until the financial crisis inequality changes generally moved in the opposite direction from the changes in the real minimum wage, while the return to skill tracks the changes in the p90/p10 percentile ratio. At the hight of the crisis, there is a confluence of all indices; subsequently, the sharp increases in the real minimum wage (along with similar increases in average real wages) are accompanied by moderate declines in inequality. The significant increase in inequality over the 2006-2007 period coincides with increases in the return to skill and its effect on the p90/p10 percentile ratio. Increases in the return to skill after 2005, therefore, seem to define the developments which resulted in the finding of this paper that wage inequality over the 2001-2007 period increased significantly, compared to the earlier period.

Future research could focus on the role of changes in the reward of skills over time. While the increasing contribution of skills in determining the "prices" component of the changes in average earnings was documented, questions such as the role of skills and in

particular the diffusion of skill-based technologies through increased openness and trade flows (or higher specialization according to economic advantage which may lead to increased demand for skills) in increasing inequality in recent years has not been established. Recent evidence on the role of trade on the demand for skills is not always conclusive. Findings by Almeida (2009) suggest that exports (as well as technology) are positively associated with the demand more educated workers. On the other hand, Fernandes and Sundaram (2008) who used the share of skilled labor in the wage bill as a measure of skills, and controlled for time-invariant firm characteristics, found a negative correlation between exports and use of skilled labor (along with a positive correlation between FDI and skilled labor).

5. Conclusion

This study uses recent advances in the methodology of assessing changes in earnings distributions over time for a detailed analysis of changes in wage inequality in Indonesia over two time periods. While mean earnings increased by about 35 percent between 1994 and 2001, they grew moderately and unevenly in recent years with female wages increasing more than male wages. In the earlier period, a little more than 50 percent of this increase is accounted for by the change in characteristics, while the remaining is attributed to changes in the prices of these characteristics. The main contributor to the effect of characteristics is education (about three-quarters of the change in characteristics), reflecting the significant increase in education attainments and this is more so for women. In the second period (2001-2007) the contribution of changes in characteristics was driven by increasing education attainment, while the effect of changes in "prices" is dominated by developments in the reward of more skilled occupations, contributing to increases in earnings. It was also found that the effect of skill is associated with increases in the endowment of higher skills,

especially for women. In the 2001-2007 period, the main effect associated with skill is the significant increase in the reward of skill, especially for the intermediate level of skill.

The results from counterfactual decompositions of the earnings distributions are of particular interest. Between 1994 and 2001, the substantial growth in the earnings of workers was accompanied by declining earnings inequality in urban areas, a development driven by the coefficients effect which was in favor of workers at the lower part of the earnings distribution, and especially so for male workers. In the more recent period the findings are drastically different. Workers at the bottom 20 percent of the earnings distribution experienced a decline in earnings; however, the earnings of workers at the top of the earnings distribution increased significantly. These results are again due to the return to earnings generating characteristics increasing sharply at higher deciles of the earnings distribution. These findings establish a drastic increase in earnings inequality among wage earners in Indonesia over the last several years.

Overall, the findings are linked to developments in the real minimum wage in relation to average real earnings. These developments go a long way in documenting a sharp drop in inequality in the early 1990s, a temporary increase during the financial crisis years, and the subsequent decline until recent years. During the last 2 years of the period examined, wage inequality increased, resulting in the overall increasing pattern found during the most recent period examined. An increase in the return to skill seems to be the reason for this finding.

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Notes

1. See for example Card and DiNardo (2002); Lemieux (2006).

2. Bargain *et. al.* (2009) look at earnings differences between Chinese and India wage earners.

3. This discussion draws on Manning (2000).

4. I used the Stata command "Oaxaca" with the "pooled" and "detail" options. This is equivalent to the Oaxaca-Ransom (1994) decomposition.

5. Estimates were also derived using age group dummies instead of experience and its square; the decomposition results are very similar.

6. Education levels are: less than primary, primary, lower secondary, secondary general, secondary vocational and tertiary (omitted: secondary general); Occupation categories are: professional, managerial, sales, service, skilled workers in agriculture production and transport, unskilled laborers (omitted: unskilled laborers); Broad industry categories are: Primary, Manufacturing/Goods and Trade/Services sectors (omitted: Primary sector); Regions are: Jakarta, West Java, Central and East Java, Sumatra, Kalimantan, Sulawesi and Eastern Indonesia (omitted: Eastern Indonesia).

7. Winchester *et.al.* (2005) use cluster analysis and propose a more proficient method to identify subcategories of workers with skill levels that are fairly uniform within groups and substantially different across groups. They use UK's 1990 *Standard Industrial Classification*, in which occupations are described by two characteristics: the educational attainment associated with each occupation, and each occupation's average wage, along with the National *Vocational Qualification* scores to characterize attainment.

8. Estimates of inequality measures for the period of the Asian financial crisis suggest that while the Gini coefficient remained approximately constant, the Theil entropy measure declined sharply in 1999 after increasing over the 1994-1998 period. This seems to suggest that financial crisis influenced wage inequality differently for those in the bottom half compared to those in the upper half of the wage distribution.

9. Existing decomposition methods do not allow isolation of the individual contribution of each covariate in the decomposition. While Machado and Mata (2005) suggested a way to compute the contribution of a particular covariate in X by using an unconditional reweighting procedure, Firpo *et. al.* (2007) show that this would be inappropriate as it would also change the distribution of other covariates that are correlated with X.

Table 1: Decomposition of the log-difference in hourly wage at the mean: 1994-2001

	All	Male	Female
Difference	0.298	0.261	0.392
	(38.8)	(30.8)	(25.8)
Characteristics	0.164	0.141	0.221
	(28.8)	(23.7)	(19.0)
Coefficients (prices)	0.135	0.121	0.171
	(23.0)	(17.4)	(15.3)
Characteristics			
Male	-0.002	-	-
	(1.9)		
Urban	0.009	0.011	0.008
	(7.6)	(8.1)	(3.3)
Experience	-0.013	-0.008	-0.020
	(5.8)	(3.3)	(4.7)
Education level	0.142	0.117	0.192
	(35.7)	(27.8)	(21.1)
Occupation	0.003	-0.001	0.015
	(1.4)	(0.4)	(3.5)
Broad Industry	0.009	0.008	0.005
	(9.6)	(6.3)	(2.0)
Region	0.016	0.014	0.021
	(11.1)	(8.7)	(7.4)
Coefficients (prices)			
Male	-0.046	-	-
	(5.0)		
Urban	-0.022	-0.016	-0.041
	(2.7)	(1.8)	(2.4)
Experience	-0.035	-0.044	0.010
	(1.6)	(1.5)	(0.3)
Education level	0.002	-0.011	0.039
	(0.2)	(0.8)	(1.4)
Occupation	0.083	0.077	-0.030
	(6.6)	(6.2)	(0.7)
Broad Industry	0.006	-0.021	0.102
	(0.3)	(1.0)	(2.3)
Region	-0.045	-0.065	-0.005
	(1.7)	(2.1)	(0.1)
Constant	0.192	0.201	0.096
	(4.1)	(3.8)	(1.0)
Sample size	63,900	44,392	19,508

Notes: z-values in parentheses.

Table 2: Decomposition of the log-difference in hourly wage at the mean: 2001-2007

	All	Male	Female
Difference	0.035	0.017	0.079
	(3.8)	(1.6)	(4.4)
Characteristics	0.018	0.000	0.051
	(2.6)	(0.1)	(3.3)
Coefficients (prices)	0.017	0.016	0.028
	(2.4)	(1.9)	(1.9)
Characteristics			
Male	-0.001	-	-
	(1.1)		
Married	0.000	-0.001	0.002
	(0.2)	(2.5)	(2.0)
Urban	-0.001	-0.002	-0.001
	(3.0)	(3.2)	(1.1)
Experience	0.003	0.002	0.004
	(1.1)	(0.8)	(0.7)
Education level	0.046	0.026	0.097
	(10.6)	(5.7)	(9.5)
Occupation	-0.030	-0.028	-0.040
	(9.6)	(7.9)	(4.9)
Broad Industry	-0.004	-0.002	-0.014
	(4.7)	(2.7)	(4.6)
Region	0.005	0.005	0.004
	(3.3)	(3.1)	(1.3)
Coefficients (prices)			
Male	0.012	-	-
	(1.1)		
Married	0.005	0.001	0.018
	(0.4)	(0.1)	(1.0)
Urban	0.020	0.011	0.047
	(1.8)	(0.9)	(2.1)
Experience	-0.058	-0.060	-0.080
	(1.8)	(1.4)	(1.8)
Education level	0.010	0.020	-0.037
	(0.7)	(1.3)	(1.3)
Occupation	0.235	0.159	0.383
	(14.5)	(9.1)	(8.3)
Broad Industry	-0.172	-0.118	-0.479
	(2.8)	(1.8)	(3.1)
Region	-0.104	-0.061	-0.209
	(3.5)	(1.8)	(3.5)
Constant	0.070	0.064	0.385
	(0.9)	(0.7)	(2.0)
Sample size	45,791	31,260	14,531

Note: z-values in parentheses.

Table 3: Decomposition of the log-difference in hourly wage at the mean by Urban/Rural

	1994-2001		2001-2007	
	Urban	**Rural**	**Urban**	**Rural**
Difference	0.194	0.337	0.042	0.039
	(20.0)	(26.7)	(3.6)	(2.5)
Characteristics	0.089	0.148	-0.002	0.044
	(12.7)	(16.9)	(0.2)	(4.1)
Coefficients (prices)	0.105	0.189	0.044	-0.005
	(14.8)	(18.1)	(5.0)	(0.4)
Characteristics				
Male	-0.002	0.003	-0.003	-0.000
	(1.5)	(1.2)	(1.6)	(0.1)
Married	-	-	0.001	-0.001
			(1.4)	(1.5)
Experience	-0.006	-0.003	0.006	-0.006
	(1.9)	(1.0)	(1.9)	(1.6)
Education level	0.087	0.109	0.042	0.061
	(18.3)	(19.0)	(7.7)	(9.1)
Occupation	-0.000	0.012	-0.042	-0.031
	(0.1)	(3.9)	(13.0)	(6.4)
Broad Industry	0.006	0.006	-0.004	0.003
	(5.0)	(4.3)	(4.6)	(1.2)
Region	0.003	0.022	-0.001	0.019
	(1.8)	(8.5)	(0.7)	(6.5)
Coefficients (prices)				
Male	-0.034	-0.039	0.009	0.018
	(3.1)	(2.3)	(0.7)	(0.9)
Married	-	-	0.010	-0.001
			(0.7)	(0.1)
Experience	-0.054	-0.004	-0.090	0.024
	(2.0)	(0.1)	(2.5)	(0.4)
Education level	0.012	-0.009	0.013	-0.028
	(1.0)	(0.3)	(0.9)	(0.9)
Occupation	0.074	0.062	0.272	0.156
	(4.9)	(2.8)	(14.4)	(7.0)
Broad Industry	0.036	-0.002	-0.234	-0.195
	(0.9)	(0.1)	(4.5)	(7.0)
Region	0.092	-0.197	-0.072	-0.146
	(2.4)	(4.7)	(1.8)	(3.3)
Constant	-0.021	0.379	0.135	0.167
	(0.3)	(4.7)	(1.8)	(2.1)
Sample size	41,233	22,667	30,516	15,275

Note: z-values in parentheses.

Table 4: Contributions of endowment of skill and return to skill to wage growth

	1994-2001				
	All	**Male**	**Female**	**Urban**	**Rural**
Skill 1 (Skilled)					
- Characteristics	0.043	0.032	0.077	0.010	0.051
	(13.2)	(9.6)	(8.9)	(2.3)	(10.4)
- Coefficients (prices)	0.035	0.037	-0.037	0.037	0.025
	(3.9)	(7.5)	(2.0)	(5.2)	(3.5)
Skill 2 (Semi-skilled)					
- Characteristics	0.001	0.000	0.0025	0.001	0.004
	(2.4)	(1.0)	(1.2)	(2.4)	(4.2)
- Coefficients (prices)	0.073	0.049	-0.0059	0.062	0.042
	(7.0)	(4.6)	(0.2)	(5.1)	(2.3)
	2001-2007				
	All	**Male**	**Female**	**Urban**	**Rural**
Skill 1 (Skilled)					
- Characteristics	-0.024	-0.025	-0.025	-0.034	-0.002
	(4.4)	(4.2)	(2.0)	(4.7)	(0.2)
- Coefficients (prices)	0.057	0.045	0.093	0.055	0.023
	(8.2)	(6.2)	(4.6)	(5.7)	(1.8)
Skill 2 (Semi-skilled)					
- Characteristics	-0.001	-0.003	-0.002	-0.001	0.003
	(2.2)	(2.5)	(0.9)	(1.0)	(1.5)
- Coefficients (prices)	0.154	0.111	0.248	0.154	0.112
	(12.8)	(8.3)	(7.9)	(10.0)	(5.2)

Note: Excluded category: Unskilled.
Based on specification in which education and occupation have been substituted by skill level, based on the worker's occupation and education level. Skill 2 refers to semi-skilled and Skill 1 to the most skilled workers.

Table 5: Inequality Measures by Year: All Wage Employees

Inequality measure	**1994**	**2001**	**2007**	**% change 2001-1994**	**% change 2007-2001**
Coefficient of Variation	1.138	1.041	1.312	-8.5	26.0
Standard Deviation of logs	0.797	0.782	0.803	-1.9	2.7
Atkinson Inequality Measure (epsilon=1)	0.283	0.269	0.303	-4.9	12.6
Gini Coefficient	0.437	0.424	0.455	-3.0	7.3
Theil Entropy Measure	0.359	0.329	0.399	-8.3	21.3
Percentile Ratios					
p90/p10	7.20	7.30	8.31	1.4	13.8
p90/p50	2.80	2.95	3.03	5.3	2.7
p75/p25	2.78	2.79	2.95	0.3	5.7
p50/p10	2.57	2.47	2.74	-3.9	10.9

Table 6: Quantile Regression Decompositions by time period

	1994-2001			2001-2007		
Quantile	**Differential**	**Characteristics**	**Coefficients**	**Differential**	**Characteristics**	**Coefficients**
10	0.277	0.121	0.156	-0.052	0.052	-0.104
	(0.017)	(0.011)	(0.015)	(0.016)	(0.013)	(0.016)
20	0.279	0.142	0.137	-0.015	0.051	-0.066
	(0.013)	(0.009)	(0.012)	(0.011)	(0.010)	(0.011)
30	0.274	0.153	0.121	0.016	0.049	-0.033
	(0.011)	(0.008)	(0.010)	(0.011)	(0.010)	(0.010)
40	0.267	0.161	0.105	0.043	0.048	-0.005
	(0.010)	(0.008)	(0.010)	(0.011)	(0.010)	(0.010)
50	0.258	0.165	0.094	0.066	0.045	0.021
	(0.011)	(0.009)	(0.009)	(0.012)	(0.010)	(0.011)
60	0.252	0.166	0.086	0.088	0.043	0.045
	(0.011)	(0.009)	(0.009)	(0.014)	(0.010)	(0.012)
70	0.250	0.163	0.087	0.109	0.040	0.069
	(0.012)	(0.009)	(0.010)	(0.015)	(0.012)	(0.013)
80	0.251	0.158	0.093	0.127	0.042	0.085
	(0.012)	(0.010)	(0.012)	(0.015)	(0.013)	(0.015)
90	0.239	0.154	0.085	0.130	0.057	0.073
	(0.013)	(0.011)	(0.104)	(0.013)	(0.013)	(0.015)

Table 7: Quantile Regression Decompositions by sex

1994-2001

		Male			Female	
Quantile	**Differential**	**Characteristics**	**Coefficients**	**Differential**	**Characteristics**	**Coefficients**
10	0.259	0.100	0.159	0.301	0.145	0.186
	(0.016)	(0.009)	(0.014)	(0.025)	(0.019)	(0.025)
20	0.265	0.107	0.158	0.343	0.168	0.174
	(0.011)	(0.008)	(0.010)	(0.020)	(0.018)	(0.020)
30	0.259	0.114	0.145	0.347	0.192	0.155
	(0.010)	(0.008)	(0.009)	(0.017)	(0.018)	(0.016)
40	0.253	0.121	0.131	0.353	0.215	0.138
	(0.010)	(0.008)	(0.009)	(0.016)	(0.018)	(0.017)
50	0.251	0.130	0.121	0.333	0.226	0.107
	(0.010)	(0.008)	(0.009)	(0.018)	(0.018)	(0.018)
60	0.249	0.136	0.113	0.303	0.219	0.083
	(0.010)	(0.009)	(0.009)	(0.019)	(0.018)	(0.018)
70	0.247	0.142	0.106	0.287	0.198	0.089
	(0.011)	(0.010)	(0.010)	(0.023)	(0.018)	(0.020)
80	0.249	0.145	0.104	0.290	0.168	0.121
	(0.013)	(0.011)	(0.012)	(0.022)	(0.016)	(0.019)
90	0.231	0.149	0.082	0.306	0.154	0.153
	(0.015)	(0.012)	(0.015)	(0.021)	(0.016)	(0.022)

2001-2007

		Male			Female	
Quantile	**Differential**	**Characteristics**	**Coefficients**	**Differential**	**Characteristics**	**Coefficients**
10	-0.107	-0.005	-0.0102	0.012	0.167	-0.155
	(0.016)	(0.009)	(0.018)	(0.026)	(0.031)	(0.038)
20	-0.061	0.002	-0.063	0.039	0.158	-0.119
	(0.012)	(0.008)	(0.013)	(0.024)	(0.027)	(0.030)
30	-0.029	0.005	-0.034	0.085	0.146	-0.061
	(0.009)	(0.008)	(0.010)	(0.024)	(0.026)	(0.027)
40	-0.001	0.006	-0.007	0.131	0.140	-0.009
	(0.009)	(0.007)	(0.008)	(0.024)	(0.027)	(0.026)
50	0.027	0.006	0.021	0.168	0.138	0.030
	(0.010)	(0.007)	(0.008)	(0.026)	(0.026)	(0.027)
60	0.051	0.003	0.048	0.201	0.135	0.065
	(0.012)	(0.008)	(0.009)	(0.027)	(0.028)	(0.028)
70	0.077	-0.001	0.078	0.218	0.121	0.097
	(0.015)	(0.009)	(0.011)	(0.030)	(0.031)	(0.030)
80	0.101	0.001	0.100	0.199	0.100	0.099
	(0.016)	(0.011)	(0.012)	(0.030)	(0.032)	(0.031)
90	0.120	0.022	0.0.098	0.146	0.088	0.058
	(0.015)	(0.012)	(0.012)	(0.028)	(0.034)	(0.038)

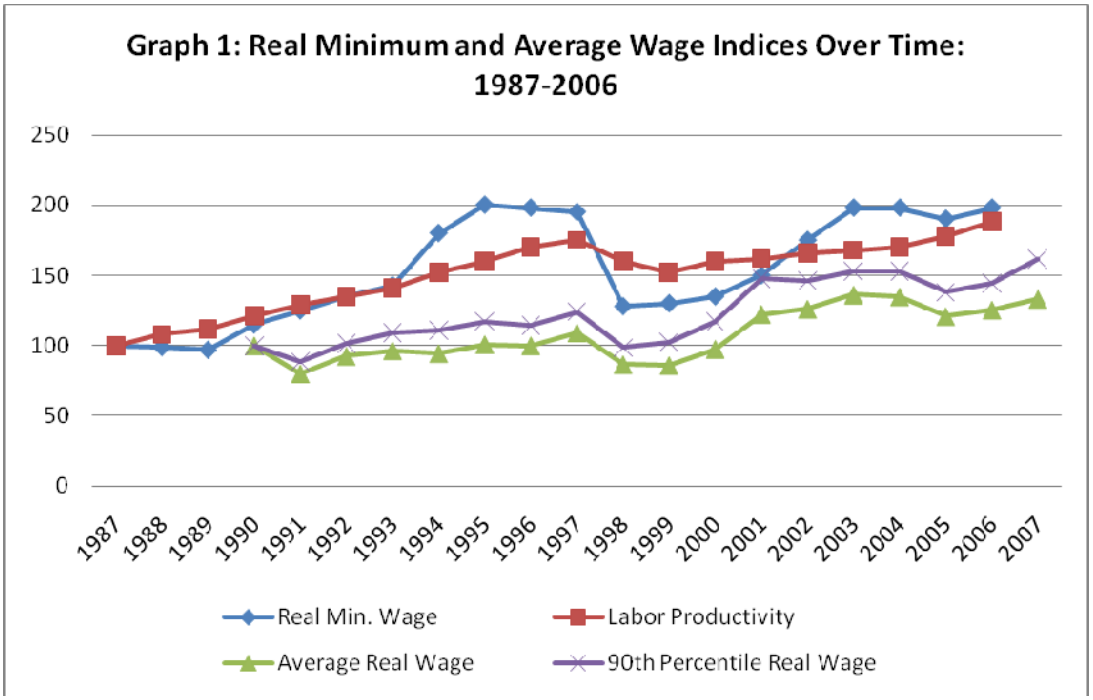
Table 8: Quantile Regression Decompositions by Urban/Rural Employment

1994-2001

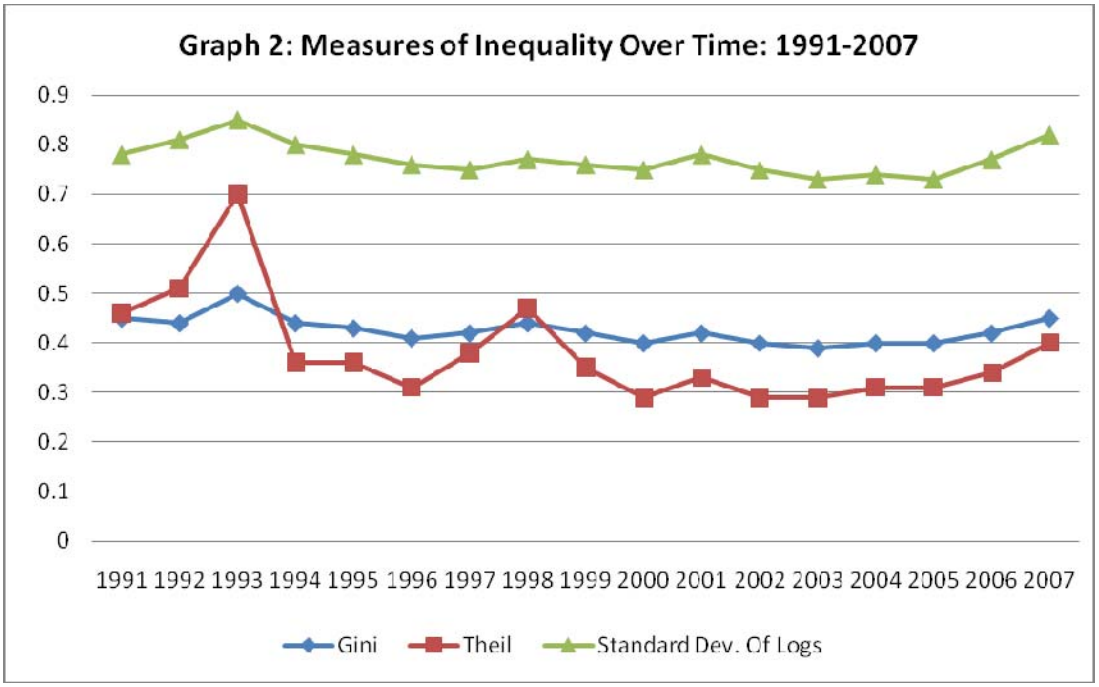
		Urban			Rural	
Quantile	**Differential**	**Characteristics**	**Coefficients**	**Differential**	**Characteristics**	**Coefficients**
10	0.226	0.043	0.183	0.269	0.053	0.216
	(0.018)	(0.010)	(0.016)	(0.023)	(0.011)	(0.024)
20	0.193	0.051	0.143	0.305	0.062	0.242
	(0.014)	(0.009)	(0.013)	(0.019)	(0.011)	(0.020)
30	0.169	0.055	0.113	0.329	0.069	0.260
	(0.012)	(0.008)	(0.010)	(0.017)	(0.010)	(0.018)
40	0.146	0.059	0.087	0.345	0.074	0.272
	(0.013)	(0.008)	(0.010)	(0.017)	(0.011)	(0.017)
50	0.130	0.063	0.067	0.361	0.085	0.276
	(0.011)	(0.008)	(0.009)	(0.018)	(0.012)	(0.017)
60	0.121	0.064	0.057	0.384	0.098	0.286
	(0.011)	(0.009)	(0.010)	(0.020)	(0.013)	(0.018)
70	0.120	0.066	0.054	0.417	0.120	0.297
	(0.012)	(0.009)	(0.011)	(0.022)	(0.015)	(0.018)
80	0.127	0.070	0.057	0.461	0.138	0.322
	(0.013)	(0.010)	(0.012)	(0.025)	(0.018)	(0.018)
90	0.122	0.076	0.046	0.483	0.154	0.328
	(0.017)	(0.012)	(0.017)	(0.024)	(0.019)	(0.020)

2001-2007

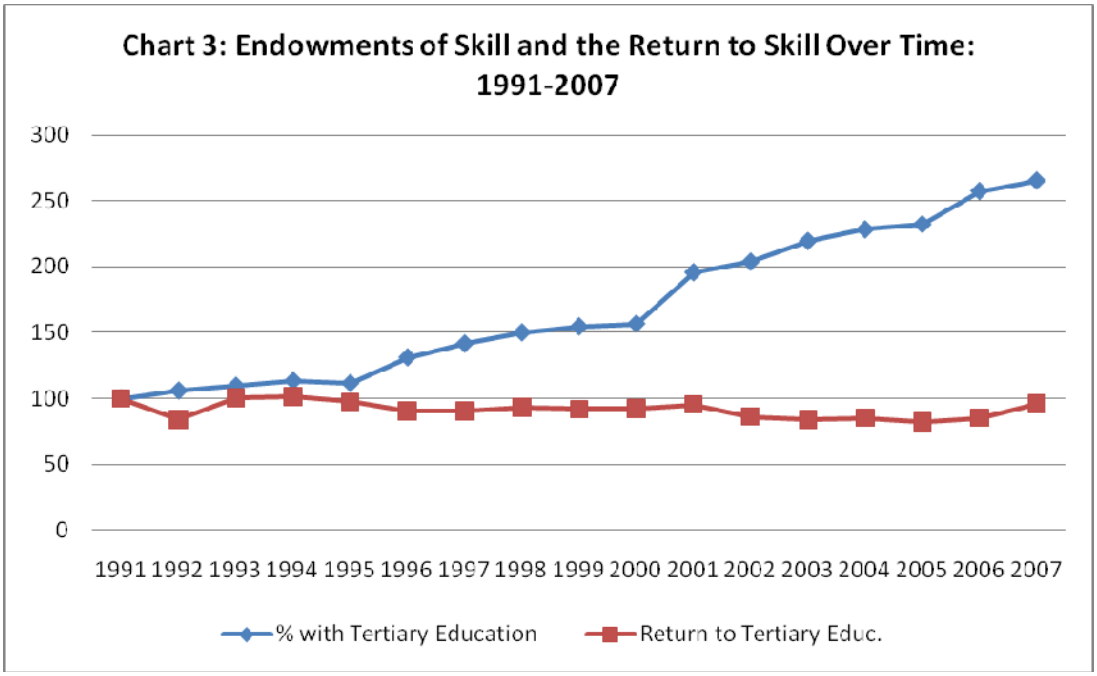
		Urban			Rural	
Quantile	**Differential**	**Characteristics**	**Coefficients**	**Differential**	**Characteristics**	**Coefficients**
10	-0.069	0.005	-0.074	0.016	0.091	-0.075
	(0.023)	(0.011)	(0.021)	(0.026)	(0.017)	(0.030)
20	-0.037	0.008	-0.044	0.059	0.096	-0.038
	(0.018)	(0.010)	(0.016)	(0.021)	(0.016)	(0.024)
30	-0.006	0.008	-0.013	0.095	0.089	0.005
	(0.015)	(0.009)	(0.013)	(0.020)	(0.015)	(0.022)
40	0.024	0.008	0.016	0.126	0.080	0.046
	(0.015)	(0.009)	(0.012)	(0.021)	(0.014)	(0.021)
50	0.057	0.009	0.048	0.149	0.070	0.079
	(0.015)	(0.009)	(0.012)	(0.022)	(0.015)	(0.022)
60	0.090	0.007	0.084	0.166	0.054	0.112
	(0.016)	(0.010)	(0.012)	(0.024)	(0.017)	(0.022)
70	0.117	0.004	0.113	0.182	0.035	0.147
	(0.015)	(0.012)	(0.013)	(0.028)	(0.020)	(0.024)
80	0.129	0.004	0.125	0.175	-0.010	0.185
	(0.015)	(0.013)	(0.014)	(0.032)	(0.025)	(0.025)
90	0.130	0.020	0.109	0.153	-0.053	0.206
	(0.016)	(0.013)	(0.017)	(0.024)	(0.026)	(0.026)



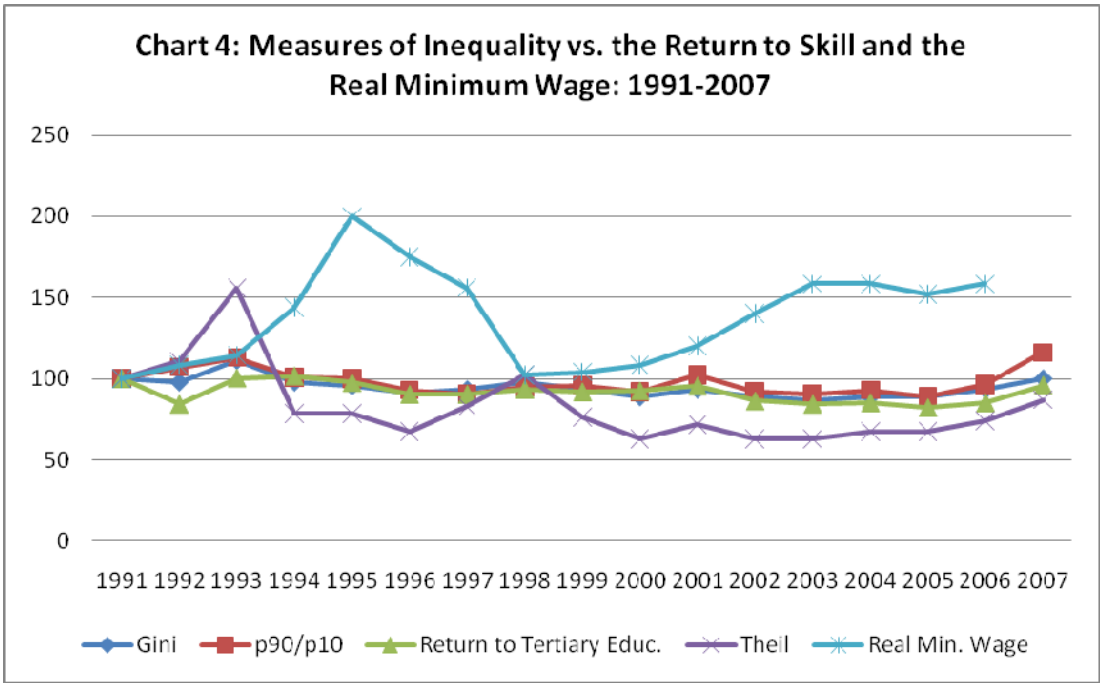
Source: Comola and deMello (2009) and author's own calculations.



Source: Author's calculations.



Source: Author's calculations using Sakernas data.



Source: Author's calculations and Comola and deMello (2009).

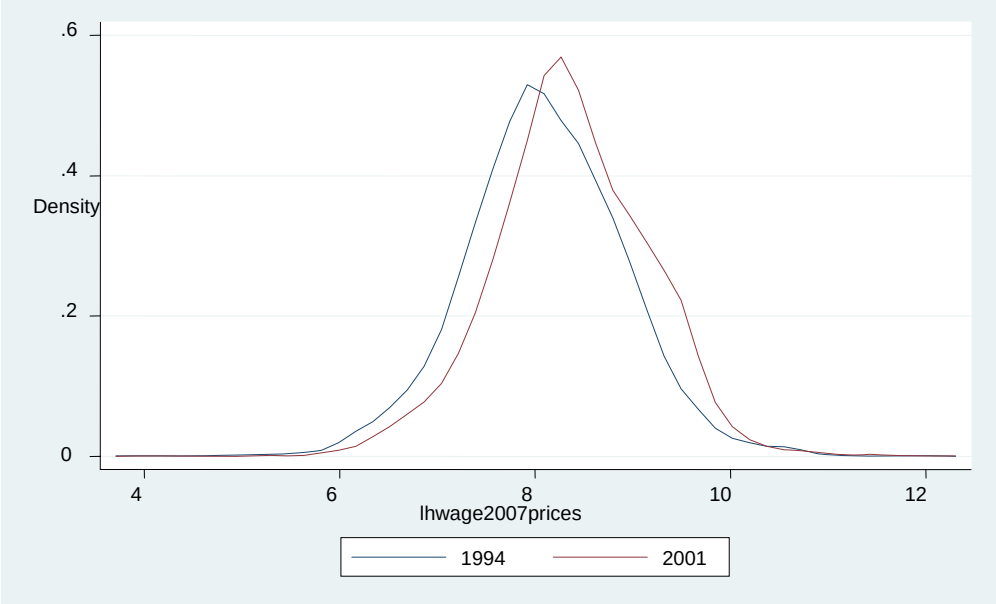
Appendix

Table A1: Mean Characteristics by year and gender

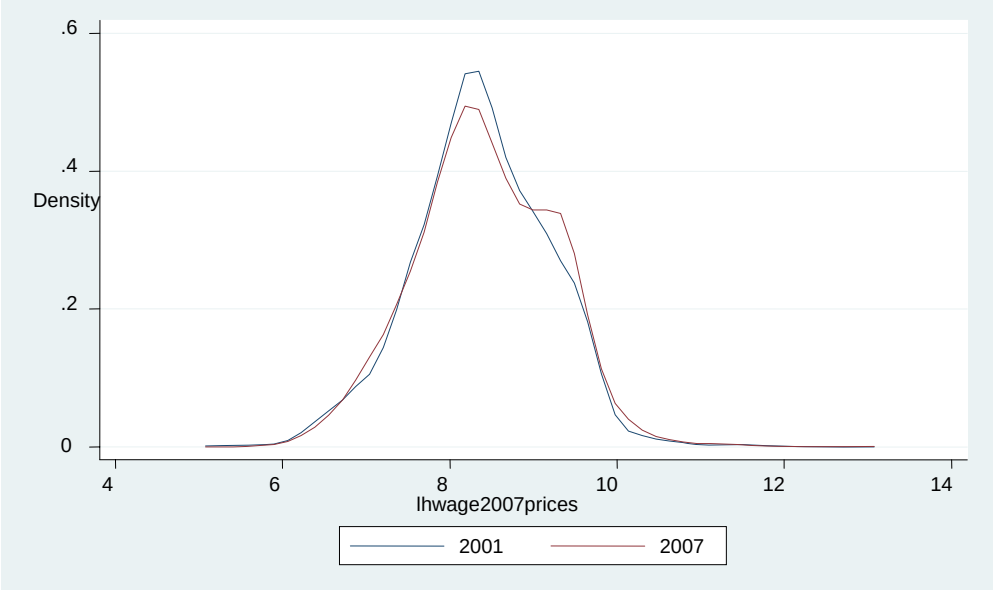
	1994		2001		2007	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
Hourly wage (2007 prices)	4,616	3,256	5,927	4,677	6,332	5,207
Urban	0.491	0.529	0.659	0.702	0.629	0.692
Age 15-24	0.219	0.372	0.187	0.352	0.197	0.312
Age 25-34	0.329	0.315	0.343	0.313	0.317	0.321
Age 35-44	0.258	0.175	0.277	0.214	0.266	0.220
Age 45-54	0.142	0.093	0.154	0.096	0.172	0.122
Age 55-65	0.052	0.044	0.039	0.026	0.049	0.025
Experience (years)	20.01	16.92	18.83	15.12	19.01	15.21
Education						
Less than Primary	0.174	0.250	0.069	0.100	0.049	0.062
Primary	0.324	0.303	0.246	0.241	0.242	0.204
Lower Secondary	0.154	0.099	0.192	0.165	0.194	0.165
Secondary General	0.149	0.123	0.207	0.168	0.231	0.197
Secondary Vocational	0.129	0.154	0.158	0.165	0.129	0.115
Tertiary	0.070	0.072	0.127	0.161	0.155	0.256
Occupation						
Professional	0.094	0.150	0.106	0.180	0.057	0.015
Manager/Official	0.151	0.118	0.163	0.158	0.136	0.251
Sales	0.053	0.072	0.066	0.095	0.114	0.151
Service	0.070	0.167	0.091	0.165	0.124	0.149
Skilled Labor	0.373	0.447	0.345	0.356	0.336	0.224
Unskilled labor	0.259	0.045	0.230	0.046	0.232	0.210
Broad Industry						
Primary sector	0.186	0.200	0.135	0.087	0.114	0.058

Industry	0.217	0.296	0.365	0.339	0.360	0.303
Trade/Services sector	0.596	0.504	0.500	0.573	0.526	0.639
Region						
Jakarta	0.079	0.087	0.082	0.096	0.076	0.095
West Java	0.240	0.195	0.247	0.223	0.240	0.212
Central/East Java	0.405	0.491	0.360	0.418	0.246	0.401
Sumatra	0.157	0.138	0.180	0.154	0.184	0.165
Kalimantan	0.044	0.028	0.050	0.038	0.060	0.049
Sulawesi	0.044	0.037	0.048	0.040	0.058	0.044
Eastern Indonesia	0.030	0.024	0.034	0.030	0.036	0.033
N	30,293	12,850	14,238	6,696	86,043	39,567

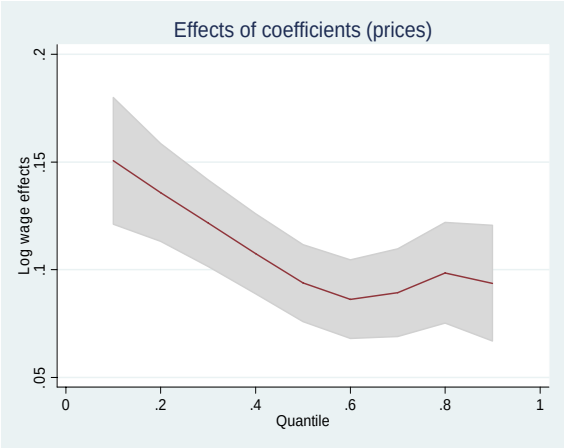
Graph A1a: Kernel Densities for the logarithm of hourly wage: 1994 and 2001



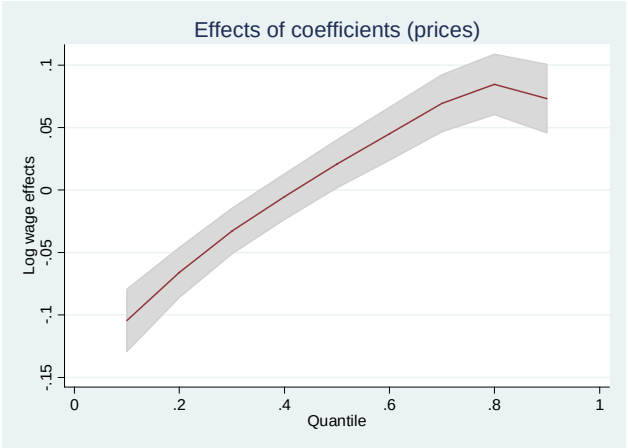
Graph A1b: Kernel Densities for the logarithm of hourly wage: 2001 and 2007



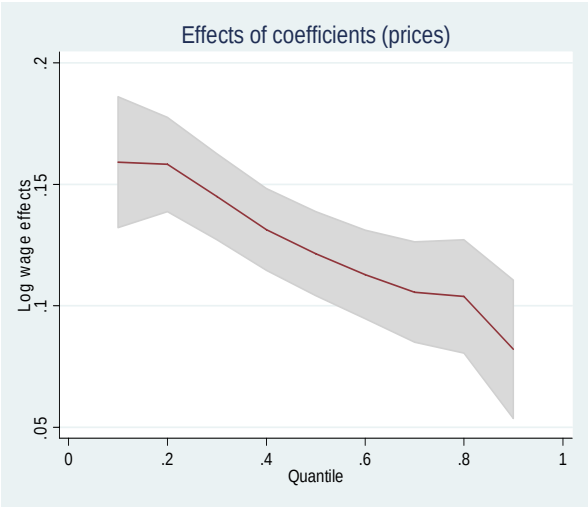
Graph A2a: All: 1994-2001



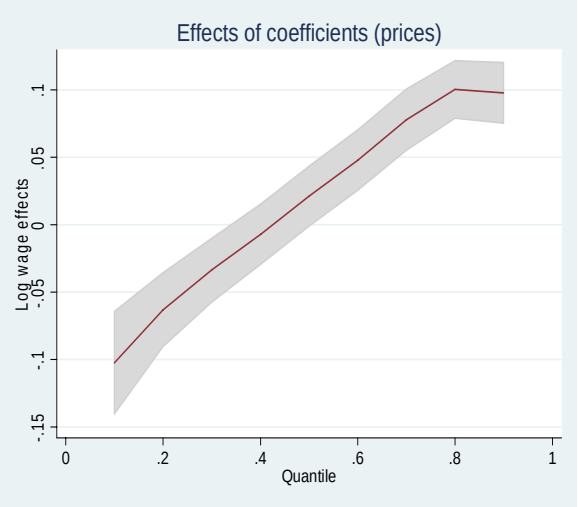
Graph A2b: All: 2001-2007



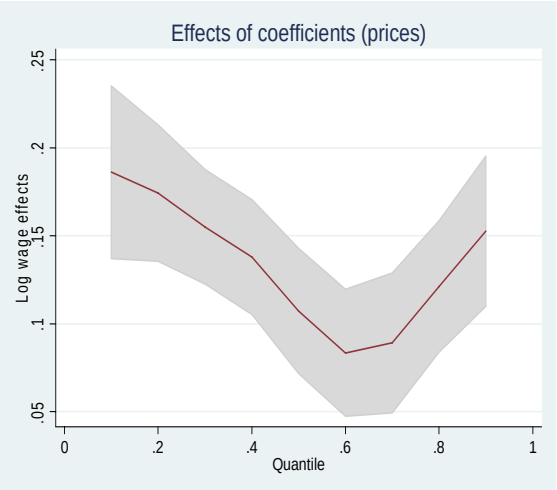
Graph A3a: Male: 1994-2001



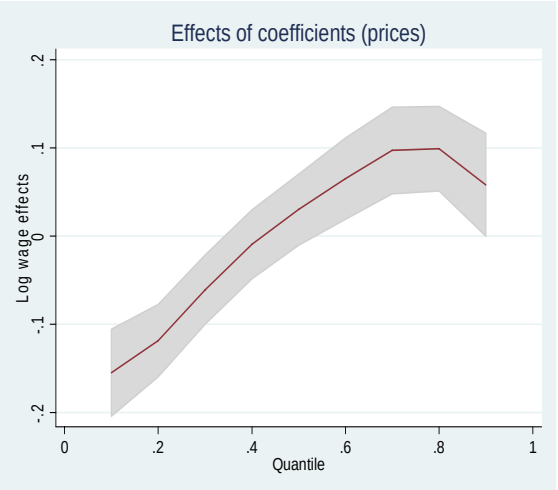
Graph A3b: Male: 2001-2007



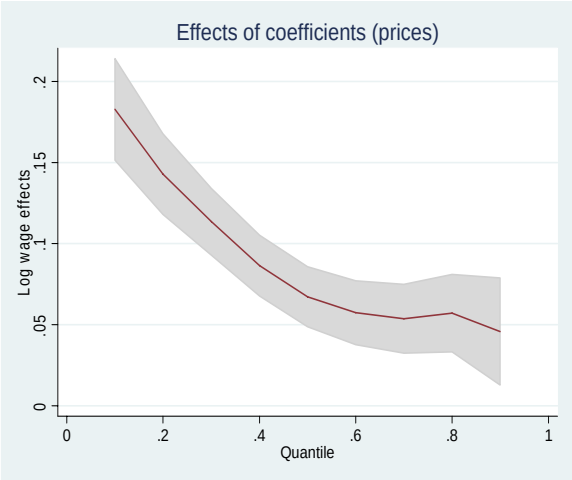
Graph A4a: Female: 1994-2001



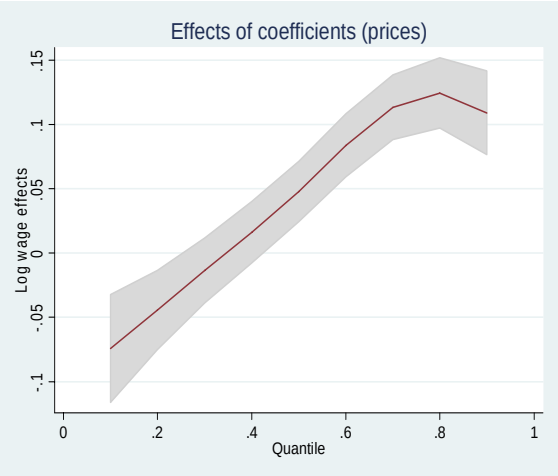
Graph A4b: Female: 2001-2007



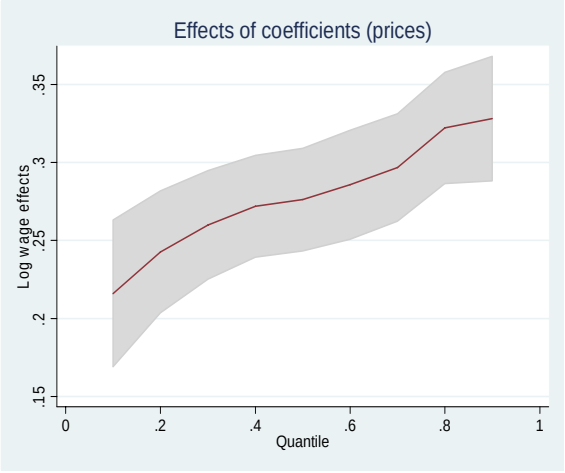
Graph A5a: All Urban: 1994-2001



Graph A5b: All Urban: 2001-2007



Graph A6a: All Rural: 1994-2001



Graph A6b: All Rural: 2001-2007