CHAPTER 9

# Compliance with Legal Minimum Wages and Overtime Pay in China, Effects Across the Distribution of Wages

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## 9.1    Introduction

Although most developing countries have extensive labor regulations, compliance is generally low (i.e., Maloney and Mendez 2004; Ronconi 2010; Strobl and Walsh 2003). There is a growing theoretical and empirical literature on the problem of non-compliance with minimum wage laws in developing countries (i.e., Gindling et al. 2015; Andalon and Pages 2008; Basu et al. 2010). Compliance with minimum wages has also generated research in China (Fang and Lin 2013; Yang et al. 2014;

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Xie 2010; Sun and Shu 2011; Du and Wang 2008; Ye et al. 2015; Ye and Yang 2015). Almost all of these papers use data from before 2010. However, unlike from 1995 to 2010, minimum wage increases tend to be higher than increases in average wages after 2010, so that the minimum wage/average wage ratio has been increasing gradually from 2010 to 2014. What is more important, a new Labor Contract Law of the People's Republic of China took effect on May 1, 2008.

The Labor Contract Law led to important changes in the way minimum wages and overtime pay are enforced. The 2008 Law makes it clear that on the date an employer recruits an employee a written labor contract shall be signed to establish a formal labor relationship. So we could expect that after 2008 employees could more easily claim their rights, including (as made explicit in the new labor law) minimum wages and restrictions on the maximum number of hours an employee can work in one week. To focus on the impact of the new Labor Contract Law, in this article we use data from before 2008 and after 2008 to examine changes in compliance with minimum wage and overtime laws. Specifically, we examine changes between 2007 and 2013. One reason for using these two years is that the minimum wage to average wage ratio (the "bite" of the minimum wage) is similar in 2007 and 2013, so that any changes that we see are likely not due to changes in the level of minimum wages in the labor market.

Minimum wages in China are set as monthly wages for full-time workers, so we begin by measuring the fraction of workers whose monthly earnings are below the monthly minimum wage. We find that the proportion of employees earning less than the monthly minimum wage increased from 3.91% in 2007 to 7.32% in 2013. However, when we consider overtime hours and calculate an implicit hourly wage, the proportion of workers earning less than the hourly minimum wage is much higher than the proportion earning less than the monthly minimum wage (13.64% in 2007). This is because low-wage workers are more likely to work overtime hours and yet not be paid for additional work. In a previous paper (Ye et al. 2015), we showed that while employers in China mostly pay above the monthly minimum wage, a large proportion of low-wage employees work overtime hours but that employers do not comply with overtime pay laws and either do not pay workers for these overtime hours, or pay less than required.

What is also interesting is that the proportion of workers earning below the hourly minimum wage declined from 2007 to 2013 (from 13.64 to 12.74%), at the same time that the proportion of workers earning below the monthly minimum wage increased. Why did the proportion of workers earning less than the monthly minimum wage increase while the proportion of workers earning below the hourly minimum wage decrease? We present evidence in this article that between 2007 and 2013 the overtime hours worked by low-wage workers in China declined, while their monthly wages did not (or at least declined more slowly). Thus, average hourly wages of low-wage workers increased. We argue that the decline in unpaid overtime hours was related to the increased compliance with overtime pay regulations after the 2008 Labor Contract Law.

Finally, we use a newly developed empirical technique to measure not only the number of workers earning less than the minimum wage, but also the degree to which sub-minimum wage workers are earning less than the minimum wage (Bhorat et al. 2013). In the empirical literature, a standard way of measuring non-compliance is as the fraction of all covered workers whose wages are below the minimum. However, this measure does not distinguish between different degrees of violation. For example, a wage just below the minimum is counted the same as a wage at one-third of the minimum, surely an inexact way to measure a violation of the regulation. In this article, we present a family of violation indices that can emphasize the depth of violation to different degrees.

While we find that while the fraction of workers earning below the hourly minimum wage fell between 2007 and 2013, we also find that the average wage shortfall of workers earning below the minimum wage increased. This is because although there was a decrease in the number of workers earning just below the minimum wage, there was also an increase in the number of workers earning well below the minimum wage. This is consistent with the hypothesis put forward in Bhorat et al. (2015) that increased enforcement could lead to partial compliance with minimum wage laws, where employers increase the earnings of those just below the minimum wage to the minimum wage (for whom compliance with minimum wage laws is relatively inexpensive), but continue to pay those with very low human capital below the minimum wage.

## 9.2    Legal Minimum Wages and Overtime Pay Regulations in China

Prior to 1994, China had no minimum wage regulations. In 1993, the first regulations on minimum wages were issued by the Labor Ministry of China (the "Enterprise Minimum Wage Regulations"). In July 1994, a minimum wage was written into China's new version of the labor law. Clause 48 of that law states that all types of enterprises in China should comply with paying local minimum wages.

In 2004, the Enterprises Minimum Wage Regulations were replaced by more general Minimum Wages Regulations issued by the Department of Labor and Social Security. In these regulations, the adjustment frequency of minimum wages was set to be no less than once every two years and coverage was extended to town-village enterprises, to employees in micro-enterprises, and to part-time workers. Penalties for violations were increased substantially from an earlier range of 20–100% of the wage that was owed to a new range of 100–500% of the wage that was owed. Restrictions were also placed on what employers could include as part of the wage when comparing to the minimum wage (Wang and Gunderson 2012). In determining if the wage is above the legal minimum, employers must not include overtime pay and legally mandated supplements to the wage such as those for night shifts and dangerous environmental conditions such as high temperature, low temperature, underground working conditions, and working in poisonous or noxious conditions.

Minimum wages are set relative to monthly earnings. The monthly minimum wage is based on a 40-hour workweek. According to labor regulations passed in 1994, laborers shall work no more than eight hours per day, five days per week. After consultation with trade unions and workers, a firm can extend the workday. If workers work more than the legal maximum of 40 hours per week, they must be paid at least 150% the wage they receive for regular hours, at least 200% of the regular wage if the overtime is on a "day of rest" (weekend), and at least 300% the regular wage if the overtime is on a statutory holiday. Fines for violating overtime pay regulations include back pay plus an additional 50 to 100% of the wage owed.[1]

On May 1, 2008, the Labor Contract Law of the People's Republic of China took effect. Article 7 of the Labor Contract Law of the People's Republic of China states that an employer's labor relations with an

employee shall be established on the date it recruits the employee. The employer shall keep the records of its employees for references. Article 10 of the Labor Contract Law of the People's Republic of China states that a written labor contract shall be concluded in establishing a labor relationship. So we expect an employee will be able to more easily claim their rights after the Labor Contract Law of the People's Republic of China took effect.

Minimum wages and overtime regulations were also part of the Labor Contract Law. Article 20 states that the wage of the employee shall not be less than the minimum wage rate in the place where the employer is located. Article 31 states that the employers shall strictly implement the work quota standards and shall not force or in a disguised manner force the employees to work overtime. Where the employers arrange for employees to work overtime, overtime payment shall be paid to the employees in accordance with relevant state regulations. Article 85 states that if a violation is found, the labor administration authority shall order the employer to pay labor remuneration, overtime pay or economic compensation within a prescribed period of time; where the standard of the labor remuneration is lower than the local minimum wage rate the employer shall make up the balance. Where the due payment is not made within the time limit, the employer shall be ordered to pay additional damages to the employee ranging from 50 to 100% of the amount payable. In effect, minimum wage and overtime pay regulations become more strict after the Labor Contract Law of the People's Republic of China took effect on May 1, 2008.

There is no unified minimum wage level for the entire nation. Instead, the task of setting minimum wages is delegated to the local governments. Clause 48 of the 1994 labor law requires that local governments set the minimum wage according to five principles: local minimum living expenses; the average wage level; local productivity; unemployment; and local economic development. In practice, each province-level government determines several possible minimum wage levels that could be adopted by local governments, generally three to five levels, according to local economic conditions and living standards. Then each prefectural city-level government within the province-level administrative area chooses the appropriate minimum wage levels from this published list, also based on local economic conditions and living standards. The law provides considerable flexibility for provinces and prefectural cities in setting their minimum wages. Typically, urban and suburban counties within a prefectural city have different minimum wage
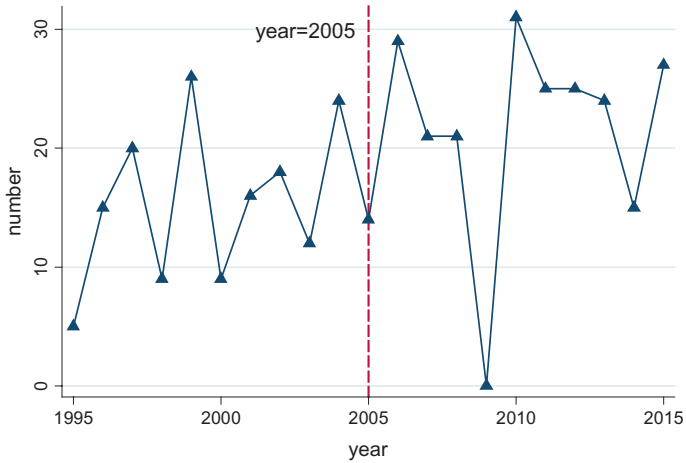
**Fig. 9.1**  The number of provinces which adjusted minimum wages

levels. Consequently, not only each province-level administrative area but also each prefectural city-level administrative area may have multiple county-level minimum wages.

Figure 9.1 gives a demonstration of the number of provinces which adjusted minimum wages in each year. We can see from Fig. 9.1 that there is an apparent shift in the number of provinces that raised the minimum wage standards in 2004, indicating that the minimum wage adjustment had become more frequent since that year. We can also see that there are no provinces which adjusted minimum wages in 2009. The reason is that at the end of 2008 the Department of Human Resources and Social Security instructed local governments to restrain from increasing minimum wages in 2009 as a way to ease the negative influence of international financial crisis. However, as the influence of financial crisis faded, there was a new round of minimum wages increase since 2010. In 2010, 30 of the 31 provinces increased minimum wages and the average increase was around 20%.

In order to measure the minimum wage standard at a national level, we first calculate average minimum wages in each province according to minimum wages applied in different regions in that province. We then calculate weighted average minimum wages with the weight being the actual days of implementation of each minimum wage.
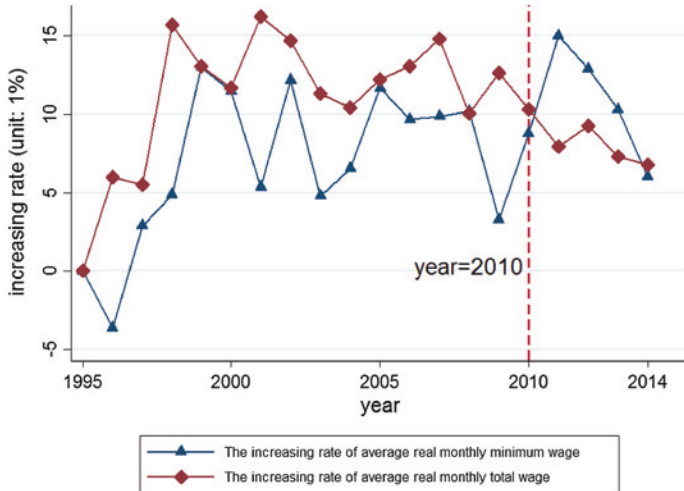
**Fig. 9.2** The rate of change in the average real monthly wage and monthly minimum wage (*Note* All wages adjusted by urban CPI, base year=1995)

Figure 9.2 shows year-to-year rates of change in real average wages and average real minimum wages in China from 1995 to 2015. We can see from Fig. 9.2 that both average wages and minimum wages have been increasing every year since 1996. However, from 1995 to 2010 the increase in average wages is generally greater than the increase in minimum wages, so that the minimum wage to average wage ratio fell. A recession from 2010 to 2014 led to a reduction in the rate of growth of both real average wages and real minimum wages. Unlike prior to 2010, from 2010 to 2014 the rate of growth of minimum wages was higher than the rate of growth of average wages, so that the minimum wage to average wage ratio increased.

Figure 9.3 presents the minimum wage/average wage ratio in China from 1995 to 2014. Consistent with Fig. 9.2, Fig. 9.3 shows that the minimum wage/average wage ratio decreased steadily from 1995 to 2010 and then increased from 2010 to 2015. Overall, the minimum wage-average wage ratio in China is low compared to other countries. As of 2015, this ratio in OECD countries was well above 35%, while in China this ratio was only a little more than 25%. Important for this article, the minimum wage to average wage ratio is similar in the two years for which we have data, 2007 and 2013.
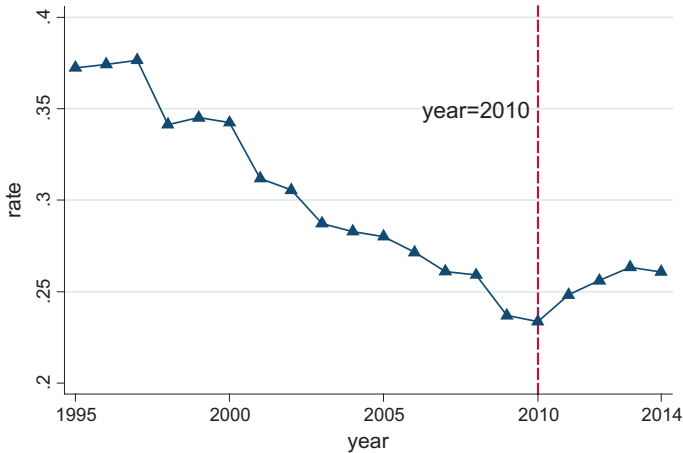
**Fig. 9.3**  Average minimum wage as a percentage of the average wage

## 9.3  Literature Review

As noted, official Chinese minimum wages are set in monthly terms for full-time workers. Almost all papers found that there is broad compliance with legal monthly minimum wages in China. Jia and Du (2015) use the Chinese Urban Labour Survey (CULS) data to examine compliance with minimum wage. Three waves of Chinese Urban Labour Survey, CULS2001, CULS2005, and CULS2010. CULS surveyed urban and migrant workers in 5 cities (Shanghai, Wuhan, Shenyang, Fuzhou, and Xian). They found that the proportion of workers whose wages below monthly minimum wage is 9.84% in 2001, 17.26% in 2005, 13.26% in 2010. The wage of female and low education workers is more likely to be below minimum wage. Unlike in 2001 and 2005, there was no difference in compliance with minimum wages between different cities in 2010. Fang and Lin (2013), using the annual Urban Household Survey from 2002 to 2009, find that the proportion of civilian employees (excluding self-employed and students) whose total monthly wage is below the minimum wage was 5.6%. Yang et al. (2014), using a survey of internal migrants from 2011 and 2012, estimate that approximately 5% of migrants earned at or below the monthly minimum wage,

Ma and Li (2015), using Chinese Household Income Survey Data for 1995, 2002, and 2007, find that less than 5% of workers earned less than the monthly minimum wage in any year. Ye et al. (2015) use a matched firm-employee dataset to examine the extent of compliance with minimum wage and overtime pay regulations in Chinese formal sector firms. They find evidence that there is broad compliance with legal minimum wages in China; fewer than 3.5% of full-time workers earn less than the legal monthly minimum wage.

However, many Chinese work more than full-time. Gan and Zhao (2016), using a survey of 528 migrant workers from Quanzhou and Fuzhou enterprises of Fujian Province in 2012, found that 93.3% of the surveyed migrant employees work overtime regularly and 57.8% of them work 10–12 hours a day. Employers arrange for employees work overtime in accordance with the regulation of enterprise in the form of double-shift work. Gu and Lv (2015) use 1% of the national population census data in 2005 to examine the compliance with minimum wage. They found that overtime work is widespread in China; 93.64% of workers work overtime (64.04% of workers whose weekly working hours are between 40 and 48. 29.6% of workers whose weekly working hours are more than 48 hours). According to the relevant laws and regulations, workers who work more than 40 hours per week should be paid at least 1.5 times their regular hourly wage for the overtime hours that they work (2.0 times on weekends and 3.0 times on holidays). In order to consider the long working hours for migrant workers, many papers calculate the imputed hourly minimum wage for full-time workers. When using imputed hourly minimum wage, almost all papers find that there is substantial non-compliance with overtime pay regulations.

Xie (2010) surveys 485 rural migrants in three cities in Jiangsu province in 2009, finding that the proportion of workers whose total monthly wage is below the monthly minimum wage is 3.9%, while over 25% of workers in his sample earn less than the hourly minimum wage when overtime hours are taken into account. Sun and Shu (2011) study rural migrants in 9 cities in Guangdong province in 2006, 2008, 2009, and 2010. They find that the proportion of workers whose monthly wage is less than the monthly minimum wage is 9.0, 7.7, 4.0, and 4.2%, respectively, in these four years, while the proportion of workers whose hourly wage is below the implicit hourly minimum wage for full-time workers was 45.3, 33.3, 28.1, and 23.8%. Du and Wang (2008) use data from five capital cities in Shanghai, Wuhan, Shenyang, Fuzhou, and Xian in 2001

and 2005 and find that the monthly wage is below the monthly minimum wage for 11.2% of workers, but that the hourly wage was below the implicit hourly minimum wage for full-time workers for 52.2% of workers. Ye et al. (2015) use a matched firm-employee dataset to examine the extent of compliance with minimum wage and overtime pay regulations in Chinese formal sector firms. They find evidence that there is broad compliance with legal minimum wages in China; fewer than 3.5% of full-time workers earn less than the legal monthly minimum wage. On the other hand, they find evidence that there is substantial non-compliance with overtime pay regulations; almost 29% of the employees who work overtime are not paid any additional wage for overtime hours and 70% are paid less than the legally required 1.5 times the regular wage.

Ye and Yang (2015) use data on 3451 migrant workers in fifteen cities in nine provinces in 2008 to examine the compliance with minimum wage. They also use the family of violation indices developed by Bhorat et al. (2013) that takes into account the depth of violation. They found that the proportion of workers whose monthly total wage below the monthly minimum wage is 4.26%. The percentage shortfall of the average wage from the minimum wage is 16.51%. When using imputed hourly minimum wage, the proportion of workers whose hourly wage below hourly minimum wage rises to 32.21% and the percentage shortfall of the average wage from the minimum wage rises to 22.87%. When they consider that overtime pay should be at least 1.5 times of the regular salary, the proportion of workers whose wage below hourly minimum wage rises to 43.94% and the percentage shortfall of the average wage from the minimum wage rises to 27.16%. They also examine the difference of compliance with minimum wage between different cities. After controlling the individual characteristics and job characteristics, there are still significant differences between cities in compliance with minimum wage. They found that minimum wage level and enforcement are two main reasons determining the compliance difference of different cities.

All the above papers have found that there is broad compliance with the official monthly legal minimum wage in China. On the other hand, they also find evidence that there is substantial non-compliance with overtime pay regulations.

Almost of all of the papers in the literature use only one year of cross-sectional data to examine the compliance with minimum wage regulations. In particular, there are no papers that use data before the year 2008 and after the year 2008 to examine compliance with minimum

wage regulations. As noted, a big change took place in the Chinese labor market regulations in 2008. In this article, we use Chinese household survey data for 2007 and 2013 to examine the new changes of compliance with minimum wage regulations. What is more, this article not only examines the violation rate of the minimum wage but also the depth of violation.

## 9.4   Data

We use the Chinese Household Income Project (CHIP) survey data for 2007 and 2013 to examine compliance with minimum wage. The CHIP survey data includes three parts: the urban household survey, the rural household survey, and the rural-to-urban migrant household survey. For 2007, the urban survey covered 5000 households containing 14,683 individuals selected from 18 cities in nine provinces, whereas the rural survey covered 8000 households containing 31,791 individuals selected from 69 counties in nine provinces. The migrant survey covered nearly 5000 households containing 8446 individuals selected from 18 cities in nine provinces. For 2013, the urban survey covered 6674 households containing 19,887 individuals selected from 126 cities in fourteen provinces, whereas the rural survey covered 10,490 households containing 39,065 individuals selected from 123 counties in fourteen provinces. The migrant survey covered 726 households containing 2210 individuals selected from 87 cities in fourteen provinces.

For stratified samples such as CHIP, the numbers of urban versus rural respondents and of respondents in different regions and provinces are not proportional to the populations in these different locations. In this case, using weights may be needed when the sample sizes of the strata and sampled groups are not proportional to their population shares. Historically, the CHIP survey sample was stratified on two geographic dimensions, rural/urban and East/Center/West. In the construction of weights, it is possible to disaggregate the sample further among provinces within each of the East/Central/West regions. Weights can be used to adjust for the fact that the provincial sample sizes are not proportional to their populations. The CHIP survey, however, does not cover all of China's provinces, the numbers of provinces differ among the three regions, and the provinces covered have changed across rounds of the survey. Consequently, in the discussion below we mainly use urban/rural/migrant and region (two levels) weights. The three regions

(East/Center/West) are subdivided into their respective urban, rural, and migrant populations, for a total of nine subgroups or strata. Weights are constructed accordingly based on the sample sizes versus population sizes of the nine strata.

Construction of weights requires information on the population of individuals in each of the different subgroups or strata of the survey. The National Bureau of Statistics (NBS) regularly publishes population statistics for China's urban populations by region and by province, but not for migrants. Some NBS publications report statistics on migrants, but different publications give different estimates of the size of the migrant population. Using information from these different publications, we construct alternate sets of weights that reflect lower, upper, and middle estimates of the size of the migrant population. Our weights are based on numbers in the population census and 1% population sample surveys, which yield the smallest estimates of the migrant population.

Shares of migrants in the population for 2007 and 2013 are calculated using data from the 2005 1% population sample survey and 2010 population census, respectively. These shares are applied to national population data for 2007 from the 2008 *Yearbook* and for 2013 from the 2014 *Yearbook*. The migrant population is equal to the share of the migrant population times the national population. Based on the estimates of the national migrant population and using the information on the urban and total population, we calculate the urban/migrant population shares by region in each of 2007 and 2013.

We use the population information discussed above together with information from the CHIP datasets to construct weights which are urban/migrant x region weights for individual-level analysis when using CHIP datasets that have individuals as the unit of observation. To obtain a clear estimate of compliance with minimum wages we need to constrain our data. First, the sample of rural area was dropped as rural areas are not covered by minimum wage policy. Second, because minimum wages apply only to paid employees of firms, we exclude the unemployed, unpaid family workers, self-employed, those with temporary jobs. Third, to be consistent with the official Chinese definition of the labor force, we only keep employees whose age is between 16 and 60. Finally, as the minimum wage schedule for part-time workers is different from that of full-time workers, and few part-time workers exist in the CHIP data, we keep data only on full-time workers. After cleaning the data, in 2007, 6008 urban individuals and 4907 migrant individuals are left.[2]

In 2013, the urban survey covered 6674 households containing 19,887 individuals selected from 126 cities in fourteen provinces. The migrant survey covered 726 households containing 2210 individuals selected from 87 cities in fourteen provinces. Descriptive statistics are presented in the Appendix, Table 9.5.

## 9.5    Percentage of Workers Earning Below the Minimum Wage, 2007 and 2013

Table 9.1 presents the proportion of workers earning below the monthly and implicit hourly minimum wage for 2007 and 2013 (assuming that workers should be paid the same hourly rate for overtime work as the implicit hourly wage for full-time work). There are important differences between these two measures in the proportion of workers earn less than the minimum wage. First, in both years the proportion of workers whose hourly wage is below the hourly minimum wage (13.64% in 2007) is much greater than the number of workers whose monthly earnings are below the monthly minimum wage (3.91% in 2007). Second, while the proportion earning less than the monthly minimum wage increases significantly from 2007 to 2013 (by 3.72 percentage points), the proportion of workers earning less than the hourly minimum wage decreased significantly (by −1.36 percentage points).

The differences between the proportion earning less than the monthly and hourly minimum wage are explained by differences in overtime hours worked by low-wage workers. Table 9.2 shows that, in both 2007 and 2013, workers in the lowest quintiles of the earnings distribution are

**Table 9.1**   Estimates of the proportion of workers earning below the minimum wage, 2007 and 2013

| | *Proportion of workers whose monthly earnings are below the monthly minimum wage* | | | *Proportion of workers whose hourly wage is below the imputed hourly minimum wage* | | |
|---|---|---|---|---|---|---|
| | *2007* | *2013* | *2007–2013 change* | *2007* | *2013* | *2007–2013 change* |
| **All** | 3.91 [3.54–4.26] | 7.32 [6.8–7.86] | 3.41 | 13.64 [13.00–14.28] | 12.74 [12.04–13.43] | −0.9 |

*Note* 95% confidence intervals in brackets

**Table 9.2**  Average weekly working hours, 2007–2013

| | *Average weekly hours* | | |
| --- | --- | --- | --- |
| | *2007* | *2013* | *2007–2013 change* |
| **All** | 48.0 | 48.4 | 0.4 |
| Ascending sort by workers' total monthly wage | | | |
| The first quintile | 52.1 | 49.1 | −3.0 |
| The second quintile | 50.4 | 48.8 | −1.6 |
| The third quintile | 48.4 | 48.7 | 0.3 |
| The fourth quintile | 45.7 | 48.3 | 2.6 |
| The fifth quintile | 43.7 | 47.1 | 3.4 |

more likely to work overtime hours than higher-wage workers. In 2007, the average workweek for workers in the first quintile of the wage distribution was 52.1 and for the second quintile was 50.4 (compared to a legal full-time workweek of 40 hours). Ye et al. (2015) present data that shows that employers in China are likely to comply with the monthly minimum wage but that a large proportion of employers do not comply with overtime pay regulations. That is, employers require low-skilled workers to work more than the legal workweek, but do not pay these workers for these overtime hours, or pay less than required. Therefore, low-skilled workers who have monthly earnings near the minimum wage have hourly wages below the hourly minimum.

Figures 9.4 and 9.5 illustrate the differences in the distribution of monthly earnings and hourly wages relative to the monthly and implicit hourly minimum wage. As is clear from these figures, in both 2007 and 2013, while the top of the distributions of both monthly earnings and hourly wages is similar, the bottom of the distribution of hourly wages is quite different from the bottom of the distribution of monthly earnings. Specifically, there are many more workers whose hourly wages are below the hourly minimum wage compared to the monthly minimum wage. These workers tend to be those whose monthly earnings are above the minimum wage but whose hourly wages are below (but near) the minimum wage. It is also clear from these figures that the differences between the distributions of monthly earnings and hourly wages at the bottom of the distribution are much smaller in 2013 than in 2007.

Figure 9.6 shows how the distribution of monthly earnings relative to the monthly minimum wage changed between 2007 and 2013.
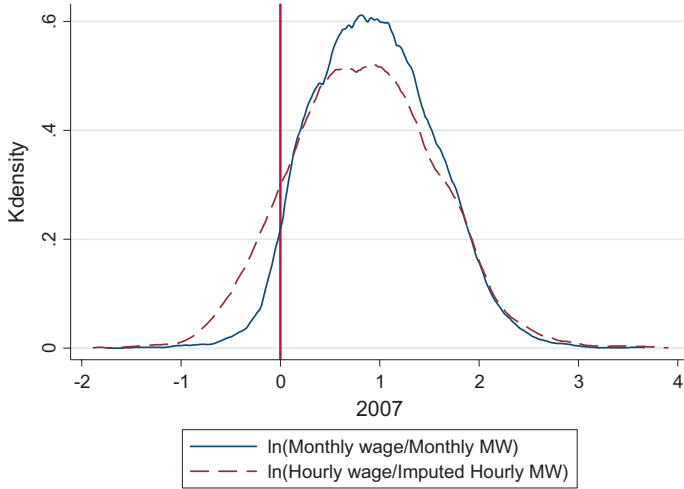
**Fig. 9.4**  The Kdensity of Ln(Monthly Wage/Monthly MW) and Ln(Hourly Wage/Imputed Hourly MW) in 2007 (bw=0.1)
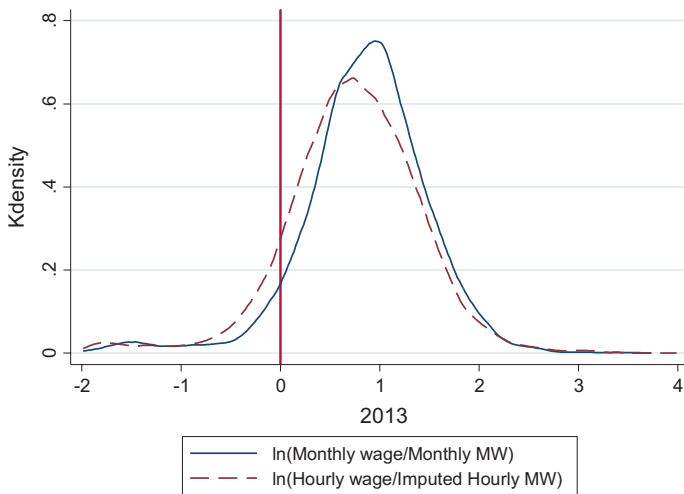


**Fig. 9.5**  The Kdensity of Ln(Monthly Wage/Monthly MW) and Ln(Hourly Wage/Imputed Hourly MW) in 2013 (bw=0.1)

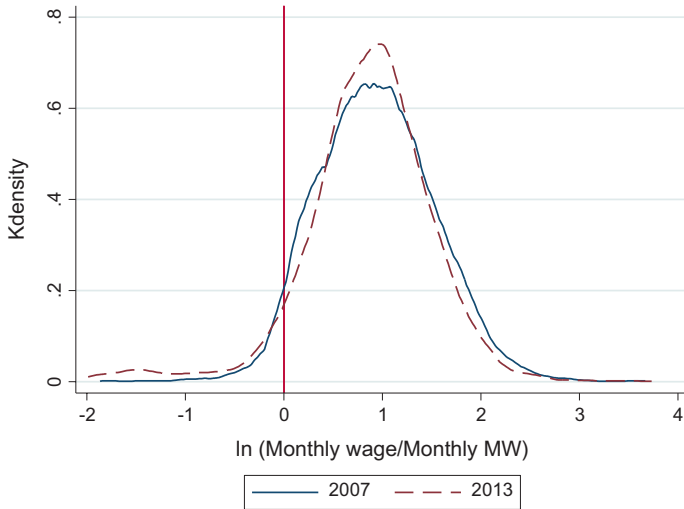**Fig. 9.6** The Kdensity of Ln(Monthly Wage/Monthly MW) (bw = 0.1)

From this figure, one can see that the proportion of workers earning below the monthly minimum wage increased between 2007 and 2013. However, as Fig. 9.7 shows, the proportion of sub-minimum wage workers who worked overtime hours decreased substantially between 2007 and 2013.[3] The result is that workers with low monthly wages saw their hourly wages (monthly wage divided by hours worked) increase more rapidly than their monthly wages between 2007 and 2013.[4] Thus, many low-wage workers who were earning less than the hourly minimum wage in 2007 were not earning less than the hourly minimum in 2013. As Fig. 9.8 shows, the proportion of workers earning below the hourly minimum wage decreased from 2007 to 2013.

Table 9.3 presents the proportion of workers earning less than the monthly and hourly minimum wage, along with average hours worked, for different subsets of workers. It is clear from Table 9.3 that workers with less human capital (migrants, less experience, and less education) are more likely to work more hours. Also clear is that the differences between the proportion of workers earning less than the monthly minimum wage and the hourly minimum wage are larger for workers with less human capital. This suggests that workers with low human capital,

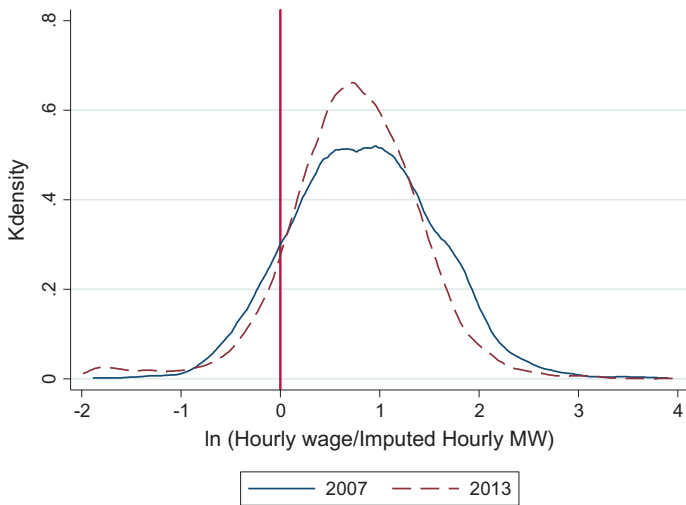**Fig. 9.7** Average weekly working hours for different Ln(Monthly Wage/Monthly MW) (bw=0.1)



**Fig. 9.8** The Kdensity of Ln(Hourly Wage/Imputed Hourly MW) (bw=0.1)

**Table 9.3**  Estimates of the proportion of workers earning below the minimum wage, 2007 and 2013

| | Proportion of workers whose monthly earnings are below the monthly minimum wage | | | Proportion of workers whose hourly wage is below the imputed hourly minimum wage | | | Average weekly hours worked | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change |
| **All** | 3.91 [3.54–4.26] | 7.32 [6.8–7.86] | 3.41 | 13.64 [13.00–14.28] | 12.74 [12.04–13.43] | −0.9 | 48.0 | 48.4 | 0.4 |
| *Age cohort* | | | | | | | | | |
| Age 16–20 | 12.46 [10.32–14.60] | 12.15 [3.56–20.73] | −0.31 | 41.57 [38.38–44.76] | 32.65 [20.33–44.98] | −8.92 | 58.9 | 53.8 | −5.1 |
| Age 21–25 | 3.14 [2.31–3.97] | 8.3 [6.13–10.47] | 5.16 | 18.03 [16.20–19.87] | 15.7 [12.84–18.56] | −2.33 | 52.2 | 50.1 | −2.1 |
| Age 26–30 | 2.29 [1.56–3.02] | 5.94 [4.54–7.33] | 3.65 | 9.7 [8.26–11.14] | 9.39 [7.68–11.10] | −0.31 | 48.4 | 48.6 | 0.2 |
| Age 31–35 | 2.17 [1.43–2.90] | 4.52 [3.37–5.68] | 2.35 | 9.78 [8.27–11.28] | 7.86 [6.38–9.36] | −1.92 | 47.6 | 48.4 | 0.8 |
| Age 36–40 | 2.91 [2.09–3.73] | 6.1 [4.83–7.38] | 3.19 | 11.94 [10.36–13.52] | 10.98 [9.31–12.64] | −0.96 | 47.4 | 48.6 | 1.2 |
| Age 41–45 | 4.3 [3.27–5.34] | 6.49 [5.29–7.69] | 2.19 | 11.41 [9.78–13.04] | 11.59 [10.03–13.15] | 0.18 | 45.7 | 48.4 | 2.7 |
| Age 46–50 | 4.1 [2.90–5.31] | 9.34 [7.84–10.85] | 0.9 | 10.13 [8.30–11.96] | 16.17 [14.26–18.08] | 6.04 | 44.8 | 48.4 | 3.6 |
| Age 51–55 | 4.5 [2.99–6.00] | 8.82 [6.99–10.65] | 4.32 | 11.55 [9.23–13.88] | 15.11 [12.80–17.42] | 3.56 | 44.5 | 47.2 | 2.7 |

(continued)

**Table 9.3** (continued)

| | Proportion of workers whose monthly earnings are below the monthly minimum wage | | | Proportion of workers whose hourly wage is below the imputed hourly minimum wage | | | Average weekly hours worked | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change |
| Age 56–60 | 6.1 [3.49–8.72] | 13.66 [10.77–16.54] | 7.56 | 12.35 [8.76–15.94] | 21.5 [18.05–24.95] | 9.15 | 44.4 | 47.0 | 2.6 |
| *Gender* | | | | | | | | | |
| Female | 5.16 [4.52–5.81] | 10.02 [9.08–10.95] | 4.86 | 16.15 [15.07–17.22] | 16.99 [15.81–18.16] | 0.84 | 46.9 | 47.7 | 0.8 |
| Male | 3.01 [2.60–3.43] | 5.21 [4.60–5.83] | 2.2 | 11.86 [11.07–12.64] | 9.42 [8.61–10.23] | −2.44 | 48.8 | 49.1 | 0.3 |
| *Marital status* | | | | | | | | | |
| Unmarried | 5.42 [4.61–6.23] | 7.06 [5.53–8.60] | 1.64 | 21.23 [19.82–22.74] | 13.32 [11.28–15.36] | −7.91 | 52.2 | 48.5 | −3.7 |
| Married | 3.44 [3.04–3.84] | 7.36 [6.78–7.94] | 3.92 | 11.29 [10.60–11.99] | 12.49 [11.82–13.39] | 1.2 | 46.8 | 48.5 | 1.7 |
| *Experience cohort* | | | | | | | | | |
| Experience 1–2 | 7.6 [6.72–8.48] | 10.01 [8.51–11.50] | 2.41 | 27.4 [25.92–28.88] | 20.33 [18.33–22.33] | −7.07 | 53.3 | 50.5 | −2.8 |
| Experience 05-Mar | 3.65 [2.85–4.45] | 8.86 [7.50–10.21] | 5.21 | 14.7 [13.19–16.20] | 15.7 [13.96–17.44] | −0.93 | 49.2 | 50.3 | 1.1 |

(continued)

Table 9.3 (continued)

| | Proportion of workers whose monthly earnings are below the monthly minimum wage | | | Proportion of workers whose hourly wage is below the imputed hourly minimum wage | | | Average weekly hours worked | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change |
| Experience 6–10 | 2 [1.37–2.64] | 7.4 [6.14–8.65] | 5.4 | 10.11 [8.76–11.47] | 12.58 [11.00–14.16] | −0.93 | 47.9 | 48.6 | 0.7 |
| Experience 11–15 | 2.03 [1.14–2.93] | 6 [4.60–7.39] | 3.97 | 6.46 [4.90–8.02] | 9.66 [7.92–11.4] | 3.2 | 46.4 | 48.0 | 1.6 |
| Experience 16–20 | 1.86 [0.90–2.82] | 3.62 [2.40–4.84] | 1.76 | 3.85 [2.48–5.22] | 5.83 [4.30–7.36] | 1.98 | 43.7 | 46.6 | 2.9 |
| Experience 20+ | 2.67 [1.87–3.47] | 5.27 [4.26–6.29] | 2.6 | 3.76 [2.81–4.71] | 7.1 [5.93–8.26] | 3.34 | 41.7 | 45.2 | 3.5 |
| *Educational attainment* | | | | | | | | | |
| Junior high school or below | 6.59 [5.82–7.36] | 9.26 [8.16–10.35] | 2.67 | 26.16 [24.79–27.52] | 19.62 [18.12–21.12] | −6.54 | 54.2 | 52.4 | −1.8 |
| High school | 3.90 [3.29–4.51] | 8.91 [7.82–10] | 5.01 | 12.86 [11.81–13.92] | 13.50 [12.2–14.81] | 0.64 | 47.9 | 47.9 | 0.0 |
| Junior college | 1.85 [1.23–2.47] | 5.61 [4.53–6.69] | 3.76 | 3.68 [2.8–4.55] | 7.88 [6.62–9.14] | 4.20 | 42.8 | 45.7 | 2.9 |
| College or above | 0.77 [0.28–1.25] | 2.84 [2.08–3.6] | 2.08 | 1.37 [0.72–2.02] | 3.14 [2.35–3.94] | 1.78 | 41.9 | 44.5 | 2.6 |
| *Industry sectors* | | | | | | | | | |
| Manufacturing | 3.03 [2.34–3.72] | 5.57 [4.41–6.74] | 2.54 | 9.74 [8.55–10.93] | 10.57 [9–12.13] | 0.83 | 47.3 | 50.5 | 3.2 |

(continued)

**Table 9.3** (continued)

| | Proportion of workers whose monthly earnings are below the monthly minimum wage | | | Proportion of workers whose hourly wage is below the imputed hourly minimum wage | | | Average weekly hours worked | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change |
| Construction | 3.66 [2.37–4.96] | 4.56 [2.72–6.41] | 0.90 | 19.38 [16.66–22.1] | 7.07 [4.81–9.34] | −12.31 | 56.5 | 50.5 | −6.0 |
| Wholesale and retail trade | 5.11 [3.93–6.29] | 8.63 [5.83–11.43] | 3.53 | 20.95 [18.78–23.13] | 21.10 [17.03–25.16] | 0.14 | 51.0 | 53.0 | 2.0 |
| Hotels and catering services | 9.31 [7.59–11.03] | 3.40 [1.32–5.49] | −5.90 | 35.41 [32.57–38.24] | 5.74 [3.07–8.41] | −29.67 | 57.5 | 46.3 | −11.2 |
| Other industry | 3.24 [2.76–3.72] | 8.14 [7.47–8.82] | 4.91 | 9.74 [8.94–10.55] | 13.54 [12.69–14.38] | 3.79 | 45.3 | 47.4 | 2.1 |
| *Firm ownership* | | | | | | | | | |
| State funded enterprises | 2.13 [1.67–2.59] | 5.72 [5–6.45] | 3.59 | 4.78 [4.1–5.45] | 7.82 [6.99–8.66] | 3.05 | 42.8 | 45.2 | 2.4 |
| Collective enterprises | 3.99 [2.45–5.53] | 8.25 [5.73–10.77] | 4.25 | 10.66 [8.23–13.08] | 16.75 [13.33–20.17] | 6.10 | 46.1 | 46.7 | 0.6 |

(continued)

**Table 9.3**  (continued)

| | Proportion of workers whose monthly earnings are below the monthly minimum wage | | | Proportion of workers whose hourly wage is below the imputed hourly minimum wage | | | Average weekly hours worked | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change |
| Private enterprise | 4.82 [4.13–5.51] | 7.39 [6.4–8.39] | 2.57 | 20.72 [19.41–22.03] | 14.05 [12.73–15.37] | −6.67 | 53.0 | 50.3 | −2.7 |
| Foreign funded enterprise | 0.58 [−0.01–1.18] | 2.45 [0.7–4.19] | 1.87 | 2.77 [1.49–4.05] | 4.62 [2.25–6.99] | 1.85 | 44.6 | 46.9 | 2.3 |
| Self employed and other | 7.47 [6.33–8.62] | 11.01 [9.44–12.58] | 3.53 | 27.17 [25.23–29.11] | 20.68 [18.65–22.71] | −6.49 | 53.8 | 52.5 | −1.3 |
| *Firm size* | | | | | | | | | |
| Micro | 8.52 [7.16–9.89] | 11.66 [10.01–13.3] | 3.13 | 29.16 [26.94–31.38] | 22.69 [20.54–24.83] | −6.47 | 54.6 | 51.6 | −3.0 |
| Small | 4.38 [3.79–4.97] | 7.57 [6.72–8.41] | 3.19 | 15.26 [14.22–16.3] | 12.72 [11.67–13.78] | −2.53 | 48.2 | 48.4 | 0.2 |
| Medium | 2.12 [1.62–2.61] | 5.21 [4.33–6.1] | 3.10 | 8.28 [7.33–9.23] | 8.47 [7.36–9.57] | 0.19 | 45.9 | 47.1 | 1.2 |
| Large | 1.56 [0.88–2.24] | 3.52 [2.4–4.64] | 1.96 | 4.43 [3.31–5.55] | 5.46 [4.08–6.84] | 1.03 | 45.5 | 46.6 | 1.1 |

(continued)

**Table 9.3** (continued)

| | Proportion of workers whose monthly earnings are below the monthly minimum wage | | | Proportion of workers whose hourly wage is below the imputed hourly minimum wage | | | Average weekly hours worked | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change | 2007 | 2013 | 2007–2013 change |
| *Region* | | | | | | | | | |
| East | 5.35 [4.73–5.98] | 6.00 [5.25–6.75] | 0.65 | 20.04 [18.92–21.15] | 11.54 [10.54–12.55] | −8.49 | 48.7 | 48.4 | −0.3 |
| Middle | 2.47 [1.95–2.99] | 8.59 [7.6–9.57] | 6.12 | 7.16 [6.3–8.03] | 13.79 [12.58–15] | 6.63 | 46.1 | 48.5 | 2.4 |
| West | 2.71 [2.07–3.35] | 9.32 [8.03–10.61] | 6.61 | 8.47 [7.38–9.57] | 14.70 [13.14–16.27] | 6.23 | 48.9 | 48.5 | −0.4 |
| *Type of workers* | | | | | | | | | |
| Urban | 2.60 [2.2–3] | 7.53 [6.96–8.11] | 4.94 | 5.89 [5.3–6.49] | 12.40 [11.68–13.11] | 6.51 | 43.1 | 47.2 | 4.1 |
| Migrant | 6.78 [6.07–7.48] | 6.63 [4.92–8.33] | −0.15 | 30.64 [29.35–31.93] | 13.85 [11.48–16.21] | −16.80 | 58.8 | 52.5 | −6.3 |

*Note* 95% confidence intervals in brackets

and therefore low wages, likely are required to work overtime hours without being paid for the additional hours worked.

Table 9.3 also shows that, between 2007 and 2013, the average hours worked fell for those with less human capital and did not change, or even rose, for those with the most human capital. Consistent with this, the proportion of workers earning less than the hourly minimum wage fell only for those workers with low levels of human capital.

By industry sector, average hours worked fell between 2007 and 2013 in only two industry sectors, construction and hotels, and catering service, with the biggest fall in hotels and catering services (which is also the industry sector with the largest proportion of workers earning less than the minimum wage). In addition, only for these two industry sectors does the proportion of workers earning less than the hourly minimum wage falls between 2007 and 2013. By firm size, average hours worked in micro-firms fell between 2007 and 2013, and it is only in these types of firms that the proportion of workers earning below the hourly minimum wage falls significantly (−6.47%) between 2007 and 2013 (even as the proportion of workers earning below the monthly minimum wage increases between 2007 and 2013). Average hours worked in small firms almost did not change between 2007 and 2013, and the proportion of workers earning below the hourly minimum wage falls 2.53%.

By gender, women are more likely to earn less than the minimum wage compared to men. At the same time, men fared better between 2007 and 2013; the proportion of men earning less than the hourly wage fell by more than for women, and the proportion earning less than the monthly minimum wage increased by less for men than for women.

An important focus of minimum wage laws in China is to protect rural immigrants to urban areas.[5] Therefore, it is reasonable to examine how compliance with minimum wages differs for migrants compared to other urban workers. Table 9.3 shows that in 2007, the proportion of migrants earning less than the minimum wage (both monthly and hourly) was significantly higher than that of other urban workers. There were, however, important changes, especially for migrants, between 2007 and 2013. Between 2007 and 2013 the average hours worked (and implicitly the proportion of migrants working overtime) fell, while the average hours worked for other urban workers increased. Along with this, the proportion of migrants earning less than the hourly minimum wage fell from 30.64 to 13.85%, even while the proportion of other urban workers earning less than the hourly minimum wage increased

(from 5.89 to 12.40%), and the proportion of migrants earning below the monthly minimum wages almost did not change (from 6.78 to 6.63). By 2013, the proportion earning less than the hourly minimum wage for migrants was not significantly different from that of other urban workers. Consistent with Table 9.3, Figs. 9.9 and 9.10 show how between 2007 and 2013 the distribution of hourly wages relative to the minimum wage for migrant workers became much more similar to that of other urban workers.

In summary, we have developed a set of stylized facts about changes in compliance with minimum wages and overtime pay between 2007 and 2013 in China. These are: (1) In 2007, employers in China generally complied with monthly minimum wage laws but not with overtime pay laws. (2) Low-wage workers with low human capital are more likely than higher-wage workers to be required by employers to work overtime hours without additional pay. (3) Because of this, the proportion of employees with hourly wages below the hourly minimum wage is greater than the proportion of employees with monthly earnings below the monthly minimum wage. (4) Between 2007 and 2013, the proportion of employees with monthly earnings below the monthly minimum wage
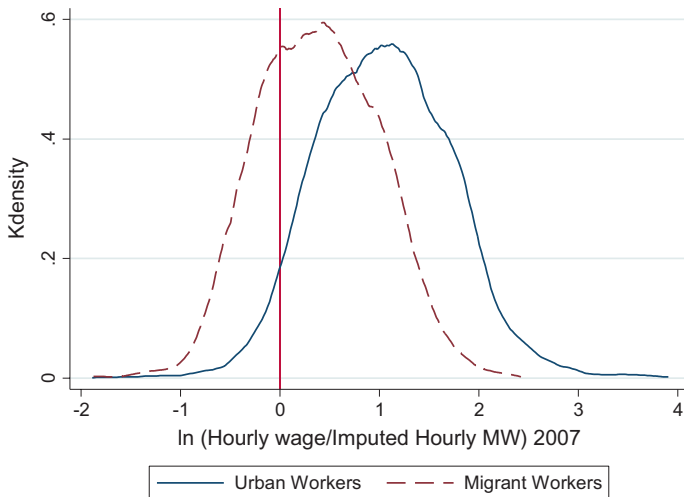


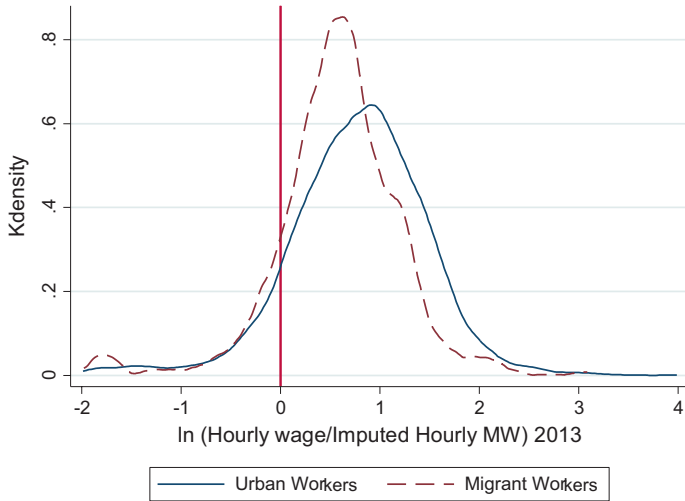**Fig. 9.9** The Kdensity of Ln(Hourly Wage/Imputed Hourly MW) about urban workers and migrant workers in 2007 (bw = 0.1)

**Fig. 9.10** The Kdensity of Ln(Hourly Wage/Imputed Hourly MW) about urban workers and migrant workers in 2013 (bw=0.1)

increased, while the proportion of employees with hourly wages below the imputed hourly minimum wage decreased. (5) This occurred because the average hours worked by low wage and low human capital workers fell from 2007 to 2013. (6) The fall in the proportion of workers earning below the hourly minimum wage, and the proportion of workers working overtime hours was greater for low-wage workers, low human capital workers, and rural migrants. The changes for rural migrants were particularly striking. The proportion of rural migrants earning less than the hourly minimum wage in 2007 was 30.64, compared to only 5.89 for other urban workers. Yet by 2013 there was no statistically significant difference between the proportion of migrants earning below the hourly minimum wage and the proportion of other urban workers earning below the minimum wage.

We next compare two possible explanations to see which is consistent with these stylized facts. In particular, what is the most likely explanation for the increase in the proportion of employees earning less than the monthly minimum wage and the fall in the average hours worked? The first possible explanation is the recession, which may have driven down the demand for labor for all workers, resulting in employers reducing

both monthly wages and hours worked. The second is that the 2008 Labor Contract Law, which effectively increased enforcement of minimum wage and overtime laws, led to a reduction in unpaid overtime but a much smaller fall in the monthly earnings of workers earning the minimum wage.

We argue that the increased effective enforcement of minimum wage and overtime laws is more consistent with the stylized facts than the effects of the recession. We would have expected the effects of the recession to have similar effects on different groups of workers: driving down employment, hours worked, and monthly earnings for all workers. However, we find that the effects on hours worked are different for different groups of workers and that this difference is not consistent with the recession explanation, but is consistent with increased compliance with workweek limits and overtime pay for workers earning at or near the monthly minimum wage. For example, real average monthly wages increased fastest between 2007 and 2013 for workers most likely to be affected by minimum wages and most likely to see a decline in their working hours. This is not consistent with the explanation that the fall in demand for labor caused by the recession affected minimum wage workers disproportionately (or even in the same way as other workers). On the other hand, it is consistent with the explanation that minimum wage laws keep the monthly wages of low-wage workers from falling as fast as the wages of high wage workers. The fall in the average hours worked by workers likely to be affected by minimum wages is also consistent with an increase in compliance with the maximum workweek and overtime hours.

The evidence comparing rural migrants to other urban workers is also consistent with the explanation that increased compliance with minimum wage and overtime laws caused the changes in the distribution of earnings. In 2007, the distribution of hourly wages relative to minimum wages was very different for migrants and other urban workers, with rural migrants earning less than other urban workers at all points in the distribution. But then between 2007 and 2013 the distribution of earnings relative to minimum wages did not simply shift left for both migrants and other urban workers, as you might expect if the recession was driving the changes. Rather, the distribution for migrants changed, shifting to the right due to a fall in the number of hours worked, while the distribution for other urban workers barely changed. By 2013 the distribution for rural migrants was similar to the distribution for other

urban workers. This suggests that there was an increase in compliance with minimum wage and overtime laws, which disproportionately affected the group that was previously earning below the minimum wage (migrants).

As additional piece of evidence that we use to understand how changes in minimum wage enforcement changed wages across the distribution, we use a newly developed empirical technique to measure not only the number of workers earning less than the minimum wage, but also the degree to which sub-minimum wage workers are earning less than the minimum wage (Bhorat et al. 2013). Using the proportion of workers earning below the minimum wage as a measure of the degree to which minimum wage laws are violated does not distinguish between different degrees of violation. For example, a wage just below the minimum is counted the same as a wage at one-third of the minimum. In this article, we use a family of violation indices developed by Bhorat et al. (2013) that takes into account the depth of violation.

Consider a distribution of actual wages $F(w)$ with density function $f(w)$, and an official minimum wage $w^m$. If there is full compliance, we should not see any wages at all below $w^m$. Bhorat et al. (2013) define the measure of violation as:

$$v = v(w^m, w)$$

where $v$ is positive if and only if $w$ is less than $w^m$, and zero if $w$ is equal to or greater than $w^m$. Bhorat et al. (2013) use a specific functional form for $v$:

**Table 9.4**  Estimates of the index of violation in 2007 and 2013

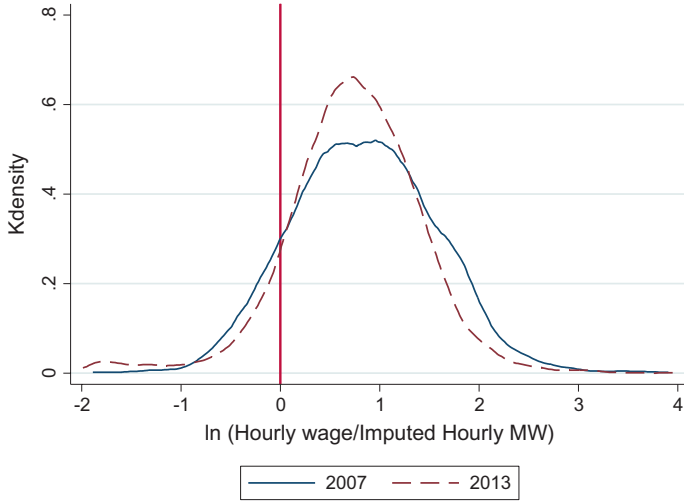|  | v0 | | v1 | | v2 | | v1/v0 | |
|---|---|---|---|---|---|---|---|---|
|  | 2007 | 2013 | 2007 | 2013 | 2007 | 2013 | 2007 | 2013 |
| *Monthly earnings* | 3.91 | 7.32 | 1.03 | 3.21 | 0.50 | 2.09 | 26.38 | 43.82 |
|  | [3.54– 4.27] | [6.78– 7.86] | [0.90– 1.16] | [2.92– 3.50] | [0.41– 0.61] | [1.86– 2.31] | [23.99– 28.78] | [41.52– 46.11] |
| *Hourly wages* | 13.64 | 12.74 | 3.76 | 4.62 | 1.57 | 2.71 | 27.57 | 36.28 |
|  | [13.00– 14.28] | [12.04– 13.43] | [3.53– 3.98] | [4.29– 4.95] | [1.43– 1.70] | [2.46– 2.96] | [26.60– 28.55] | [34.61– 37.93] |

**Fig. 9.11**  The Kdensity of Ln(Hourly Wage/Imputed Hourly MW) (bw=0.1)

$$v(w^m, w) = \begin{cases} [(w^m - w)/w^m]^\alpha; & w < w^m \\ 0; & w \geq w^m \end{cases}$$

when $\alpha = 0$, $v$ becomes an indicator function, taking on the value 1 when $w$ is less than $w^m$, and a value of 0 when $w$ is greater than or equal to $w^m$. When $\alpha = 1$, $v$ is the gap between the actual wage and the minimum wage, expressed as a fraction of the minimum wage. For values of a greater than 1, the violation function emphasizes large gaps more.

Averaging $v$ over the sample results in summary statistics measuring the extent of violation of minimum wage laws. Averaging $v0$ results in the proportion of workers earning below the minimum wage. Averaging $v1$ results in the average the gap between the actual wage and the official minimum wage for minimum wage workers expressed as a fraction of the minimum wage. Dividing $v1$ by $v0$ results in a measure of the percentage shortfall of the average wage from the minimum wage. Bhorat et al. (2013) note that this measure is analogous to the Foster et al. (1984), FGT,' measure of poverty, with the minimum wage acting as the poverty line and the wage as the income. A higher value of $\alpha$ captures greater poverty aversion.

Table 9.4 presents estimates of $v0$, $v1$, $v2$, and $v0/v1$. Table 9.4 shows that while the fraction of workers earning below the hourly minimum wage ($v0$) fell between 2007 and 2013, the average wage shortfall of workers earning below the minimum wage ($v1$ and $v1$ divided by $v0$) increased. This is because there was a decrease in the number of workers earning just below the minimum wage, but there was also an increase in the number of the lowest-paid workers who earn well below the minimum wage (see Fig. 9.11). That is, the lowest wage workers did not see their status improve between 2007 and 2013. This is consistent with the hypothesis put forward in Bhorat et al. (2015) that increased enforcement could lead to partial compliance with minimum wage laws, where employers increase the earnings of those just below the minimum wage to the minimum wage, but continue to pay those with very low human capital below the minimum wage. In this case, probably because of the recession and decrease in demand for labor, the lowest wage workers (who are still being paid below the minimum wage) saw their earnings actually decrease after the increase in enforcement.

## 9.6    CONCLUSIONS

We used CHIPs 2007 and 2013 to examine the extent to which minimum wages are complied within China. We found that 3.91% of employees in 2007 and 7.32% of employees in 2013 were receiving less than the monthly minimum wage. Overall, there are more workers whose wages below the monthly minimum wage in 2013 than in 2007. However, when we consider weekly working hours and calculate how many workers are earning below the hourly minimum wage, the proportion of workers was higher than the proportion earning below the monthly minimum wage (13.64% of employees in 2007 and 12.74% in 2013). The difference between the percent earning below the monthly minimum wage and the hourly minimum wage is explained by the fact that low-wage workers are required to work overtime hours with no additional pay.

When we compare 2007 and 2013, we find that the proportion of workers earning below the monthly minimum wage rose while the proportion earning below the hourly minimum wage fell. This occurred because the working hours of low-skilled workers (and implicitly the number of low-wage workers working overtime) decreased substantially from 2007 to 2013. Overtime work without overtime pay is widespread

in the Chinese labor market. Since the Labor Contract Law of the People's Republic of China took effect on May 1, 2008, minimum wage and overtime regulations have become more and more strict. We argue that the evidence is consistent with the explanation that the new Labor Contract Law led to the fall in hours worked by low-wage workers, while their monthly wages did not fall. Therefore, the hourly wages of low-wage workers increased between 2007 and 2013, resulting in a fall in the percent of low-wage workers earning below the hourly minimum wage.

When we also measure both the fraction of workers earning below the minimum wage and the extent by which these workers have wages below the minimum wage, we find that while the fraction of workers earning below the hourly minimum wage fell between 2007 and 2013, the average wage shortfall of workers earning below the minimum wage increased. This is because there was a decrease in the number of workers earning just below the minimum wage, but there was also an increase in the number of the lowest-paid workers who earn well below the minimum wage. This is consistent with the hypothesis put forward in Bhorat et al. (2015) that increased enforcement could lead to partial compliance with minimum wage laws, where employers increase the earnings of those just below the minimum wage to the minimum wage but continue to pay those with very low human capital below the minimum wage.

APPENDIX

See Table 9.5.

**Table 9.5**   Statistical description of variables

| Variables | Number of obs | | Mean | | Min | | Max | |
|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007 | 2013 | 2007 | 2013 | 2007 | 2013 |
| *Age* | 10,915 | 8935 | 35 | 40 | 16 | 60 | 16 | 60 |
| *Gender* | | | | | | | | |
| Proportion male | 10,915 | 8935 | 0.588 | 0.560 | 0 | 0 | 1 | 1 |
| *Marital* | | | | | | | | |
| Proportion married | 10,915 | 8932 | 0.721 | 0.876 | 0 | 0 | 1 | 1 |
| Experience | 10,783 | 8796 | 9 | 11 | 0 | 0 | 43 | 45 |
| *Educational attainment* | | | | | | | | |
| Junior high school or below | 10,915 | 8935 | 0.368 | 0.331 | 0 | 0 | 1 | 1 |
| High school | 10,915 | 8935 | 0.354 | 0.288 | 0 | 0 | 1 | 1 |
| Junior college | 10,915 | 8935 | 0.164 | 0.185 | 0 | 0 | 1 | 1 |
| College or above | 10,915 | 8935 | 0.114 | 0.196 | 0 | 0 | 1 | 1 |
| *Industry sectors* | | | | | | | | |
| Manufacturing | 10,915 | 8935 | 0.219 | 0.183 | 0 | 0 | 1 | 1 |
| Construction | 10,915 | 8935 | 0.075 | 0.058 | 0 | 0 | 1 | 1 |
| Wholesale and retail trade | 10,915 | 8935 | 0.123 | 0.049 | 0 | 0 | 1 | 1 |
| Hotels and catering services | 10,915 | 8935 | 0.101 | 0.033 | 0 | 0 | 1 | 1 |
| Other industry | 10,915 | 8935 | 0.483 | 0.678 | 0 | 0 | 1 | 1 |
| *Firm ownership* | | | | | | | | |
| State funded enterprises | 10,801 | 8919 | 0.356 | 0.406 | 0 | 0 | 1 | 1 |
| Collective enterprises | 10,801 | 8919 | 0.057 | 0.052 | 0 | 0 | 1 | 1 |
| Private enterprise | 10,801 | 8919 | 0.339 | 0.321 | 0 | 0 | 1 | 1 |
| Foreign funded enterprise | 10,801 | 8919 | 0.060 | 0.038 | 0 | 0 | 1 | 1 |

(continued)

**Table 9.5** (continued)

| Variables | Number of obs | | Mean | | Min | | Max | |
|---|---|---|---|---|---|---|---|---|
| | 2007 | 2013 | 2007 | 2013 | 2007 | 2013 | 2007 | 2013 |
| Self-employed and other | 10,801 | 8919 | 0.188 | 0.183 | 0 | 0 | 1 | 1 |
| *Firm size* | | | | | | | | |
| Micro | 10,701 | 8748 | 0.151 | 0.178 | 0 | 0 | 1 | 1 |
| Small | 10,701 | 8748 | 0.427 | 0.438 | 0 | 0 | 1 | 1 |
| Medium | 10,701 | 8748 | 0.301 | 0.268 | 0 | 0 | 1 | 1 |
| Large | 10,701 | 8748 | 0.120 | 0.116 | 0 | 0 | 1 | 1 |
| *Region* | | | | | | | | |
| East | 10,915 | 8935 | 0.433 | 0.536 | 0 | 0 | 1 | 1 |
| Middle | 10,915 | 8935 | 0.313 | 0.294 | 0 | 0 | 1 | 1 |
| West | 10,915 | 8935 | 0.254 | 0.170 | 0 | 0 | 1 | 1 |

# Notes

1. The monthly minimum wage does not apply to part-time workers. Instead, in 2004 the government mandated a separate hourly minimum wage for part-time workers. Because employers are not required to pay some non-wage benefits for part-time workers, the part-time hourly minimum wage is set above the monthly minimum wage for full-time workers (or, more specifically, the monthly minimum wage divided by the number of hours worked per month by a full-time worker). For clarity and simplicity, we do not consider part-time workers in this paper.
2. The term "migrant" refers to workers in urban areas whose home is in rural areas and who are only in urban areas temporarily for work purposes.
3. The proportion of high wage workers working overtime remained the pretty much the same between 2007 and 2013.
4. Between 2007 and 2013 the real average monthly wages of low-skilled workers (young, less experienced, with less education and migrants) increased by more than the increase in the wages of workers with more human capital. Real hourly wages for low-skilled workers increased even faster (because of falling working hours). At the same time, the increase in the real minimum wage was similar for all groups. This suggests that there was an increase in the relative demand for low-skilled workers between 2007 and 2013.
5. The term "rural migrant" in China refers to workers whose legal residence (citizenship or "hukou") is in rural areas but who are temporary migrants

to urban areas. Under the "hukou" (household registration) system, social services, such as government-subsidized health care, education, and pension, are available to workers only in their legal residence. Rural migrants generally return to their legal residence in rural areas to access these services, for holidays, and when they leave their jobs in urban areas. It is difficult to change your legal residence. Rural migrants tend to earn less than citizens of urban areas, and one key motivation for the introduction of legal minimum wages was to protect rural migrant workers (Ye et al. 2015).

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