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ABSTRACT

Regional Variation of the Minimum Wages in China

This paper analyzes the regional variation of minimum wage in China. We first introduce the institutional background of China's minimum wage policy, and then describe the regional variation of the minimum wages using detailed minimum wage data since the late 1990s. Large regional variation exists in the period studied, and the regional variation has been declining since the late 1990s. Economic factors, including GDP, economic structure, consumption level, are the main determinants for the large regional variation in the minimum wages. There is weak evidence suggesting that the regional variation is influenced by political factors, such as competition of local officials.

JEL Classification: J3, E2

Keywords: minimum wage, regional variation, China

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1. Introduction

Wages in China were set by the authority in the earlier economic regime of central planning, and no labor market existed. With the establishment of socialist market economy, the labor market has become to function (Chi et al., 2012). Employers have autonomy to hire and fire workers, and the workers have more freedom to choose employers. The wages are mainly determined by the labor market conditions. As a result, wage inequality increases. In particular, the low wages of those disadvantaged workers (less educated, young workers, laid-off workers, rural-to-urban migrants) constitute a major contributor to the rising wage inequality (Xing and Li, 2012).

The minimum wage policy was supposed to serve several purposes including increasing the income of low-paid workers, guaranteeing living standard of their families, and reducing income inequality of the whole economy. Different countries set minimum wages according to their economic development levels and the employment situations. Some countries set a uniform minimum wage for the whole country, while others set minimum wages for different regions, industries, or employment of different characteristics such as age, gender, and education levels. The complication of the minimum wage policy varies considerably across countries (Rani et al., 2013). In China, the minimum wages vary across regions, and existing studies use variation of this dimension (as well as temporal variation) to identify the effect of minimum wage policy on wages, employment, inequality, etc (See Fang and Lin, 2014; Yang and Gunderson, 2014). However, little is known about the factors that influence the regional variation of the minimum wages. This paper aims to describe the institutional background for the determination of regional minimum wages, and to explore various mechanisms behind this variation.

It seems natural to allow minimum wages to vary across regions given the large regional gap in economic development and the regional segmentation of the labor market (Kanbur and Zhang, 2005). As China's economy grows fast, and also the economic structure (including the regional pattern) changes fast, the regional pattern of minimum wages is also expected to change. But this depends on the procedure of how the minimum wages are adjusted. In practice, local governments initiate the process by bringing forth a minimum wage adjustment schedule, taking consideration of the economic development, consumption level, and employment situation. This plan forms the basis for negotiation between the local government and representatives of the employers and employees. Therefore, minimum wages are not only influenced by the economic development of different localities, but also influenced by the bargaining power of these parties.

To better understand the determination of minimum wages, we first describe the procedure for the adjustment of local minimum wages. Then we describe the regional variation of the minimum wage using detailed minimum wage data. Finally, we explain the regional variation in the minimum wages using city level variables collected from the city statistical yearbook. We find that a large regional variation during the period studied. Economic development factors, including GDP, economic structure, consumption level, are the main driving force for the large regional variation in minimum wages. There also is weak evidence suggesting that the regional variation is influenced by political factors, such as competition between officials of different locations.

The paper is related to a growing literature that studies the promotion competition between local officials (Zhou and Li, 2005). Existing studies show that this competition (like a tournament model) played an important role in China's economic growth. The basic story is as follows: Officials who are more capable of producing high GDP growth have higher probability of being promoted. This provides a strong incentive for local officials to take measures to boost the local economy. Zhang (2013) and Guo et al. (2014) indicates that personal characteristics of the local officials have a significant effect on the local policies such as the supply of land for different uses. As the minimum wage policy might influence the local economy in many ways (firm profits, firm's location choice, employment), it serves as a potential instrument of this competition.

This paper is also related to studies in other countries emphasizing the political factors in the determination of minimum wages. Flinn (2010:10), for example, documents the fierce political conflicts regarding whether the federal government should set minimum wages for each states. Sobel (1999) asks whether the adjustment of the minimum wage is influenced by political factors other than economic factors. He finds that the power of unions plays an important role.

This paper is organized as follows. The second section introduces the institutional background of the minimum wage policy. Section 3 introduces the data. Section 4 describes the regional variation in minimum wages and its trend. Section 5 uses econometric model to explore the factors that influence the regional variation of the minimum wage. Section 6 explores the variation in the time when new minimum wages were implemented. Section 7 discusses the implications of our results for reforming China's minimum wage policy. Section 8 concludes.

2. Institutional background of the minimum wage policy

China's minimum wage policy came into shape in the early 1990s. In late 1993, the former Ministry of Labor issued Provisions of Minimum Wage, the first document on the minimum wage policy. This policy did not have substantive effect because it is poorly implemented. In 2004, the Provisions of Minimum Wage was amended substantially by the Ministry of Human Resources and Social Security. The new provisions are different from the old version in the following aspects: (1) minimum wages are applicable to all enterprises including the town and village enterprises (TVEs), privately or individually owned enterprises, and non-profit organizations like schools and hospitals. (2) Hourly minimum wages was introduced into the system, which is applied to part-time employment. (3) The new regulation requires local governments to adjust the minimum wage at least once in every two years. (4) It requires the local government to publicize the minimum wages through public media. (5) The enforcement of the minimum wage policy is strengthened.

As a result of this new regulation, employers are more likely to abide the regulations as the punishment for the violation of this provision has increased significantly (it could be as high as five times of the wages detained). Meanwhile, the department of human resource and social security of the local government has the authority to inspect the enforcement of the minimum wage regulations within its jurisdiction. Unions of different levels can monitor the implementation of the minimum wage, and they can demand enforcement and penalty if violation of the minimum wage provisions was found.

The minimum wages are different across regions. Local governments play a dominant role in the process of adjusting minimum wages. The basic procedure is as follows: The department of human resources and social security at the provincial level (including province, autonomous regions, and municipalities administered directly by the central government) works out a minimum wage schedule for negotiation. This schedule is made according to the guidance of the central government (the Ministry of Human Resource and Social Security), which is usually a guideline for calculating minimum wages taking into consideration of various factors. These firstly include factors influencing the living standard of people in poverty such as urban consumer price index and the subsistence expenditure of the urban residents. As minimum wages above the equilibrium market wages will increase the labor cost of the employers and therefore reduce employment, employment situation should also be considered. Finally, the minimum wage should be adjusted according to whether it includes the social security fees and housing funds paid by the employees.

Economic development level varies a lot within a province, and the provincial government usually applies several minimum wages according to the economic development level of different regions. Generally speaking, the provincial capital city has the highest minimum wage, while remote poor regions apply the lowest. Even for the provincial capital city, it may include some relatively poor counties in suburban areas, which may choose lower minimum wages.

This adjustment plan will then be negotiated between several parties, including the provincial government, provincial level unions, association of entrepreneurs/enterprises, and chamber of commerce. The local government of the lower level can also influence the minimum wage schedule. For example, local government of the prefecture level city may negotiate a lower level minimum wage (or simply choose a lower level of minimum wage) due to the concern that high minimum wages are harmful for local governments to attract investment and to create employment.

After reaching an agreement, the plan will often be submitted to the provincial executive meetings for discussion. The provincial executive meeting is usually convened by the governor or the vice governor of a province. Thus provincial leaders can also influence the minimum wage policies, the influence depending on the power and preference of the leaders. In particular, the local officials need to compete for higher positions. The minimum wage policy might be an instrument in the competition. First, minimum wage could be a direct measure for the welfare of the local residents, with higher minimum wages representing a higher economic development level and higher living standard. Thus the local officials tend to set a higher minimum wage, a so-called keep-up-with-the-Joneses effect. On the other hand, a high minimum wage might be harmful for the economy by deterring investments and reducing employment, because from the perspective of the employers, a region with lower minimum wage seems more attractive due to lower labor cost. But, there also are some local governments, who believe that higher minimum wage will help them attract skilled workers.¹ Whether these incentives (mechanisms) exist, and to what extent they matter are subject to empirical investigation.

¹ Shenzhen for example: <http://www.cnr.cn/2004news/internal/200505310023.html>.

The minimum wage policy determined by the provincial government will then be submitted to the Ministry of Human Resources and Social Security for approval. It should be ratified by the All China Federation of Trade Unions and All China Federation of Industry and Commerce. This minimum wage adjustment policy should be publicized through the government gazette and at least one local newspaper within 7 days of approval.

The Minimum Wage Provisions issued in 2004 requires the local (provincial) government to adjust the minimum wages at least once in every two years, but does not mandate the exact date of the adjustment. Local governments often choose different dates to announce the newly adjusted minimum wage policy.

3. Data

We use several data sets in the following analysis. The minimum wage data is collected from various websites as every province publishes them once new minimum wages are determined. When a province publishes the minimum wage policy, it declares the minimum wage levels applicable to various regions or it allows local government to choose appropriate levels. Different from other studies, we use the most detailed (disaggregated) minimum wage data. Second, we collect city level information from the China City Statistical Yearbook, including the average wages for the urban workers, GDP growth rate, GDP per capita, employment, unemployment, actually utilized FDI.

As the minimum wage was not adjusted in the beginning of a year, we average the minimum wage according to the months applicable within a year. In addition, in order to match our minimum wage data with the city level variables, we also calculated weighted average of the minimum wages using the employment of the region where the minimum wages are applicable, and the formula is as follows:

$$MW_{ct} = \frac{\sum_{j \in c} MW_{jct} * employ_{jct}}{\sum_{j \in c} employ_{jct}}$$

Among which, MW_{jct} is the minimum wage in county j of city c at time t , $employ_{jct}$ is the employment of the same region at time t . Using a similar formula, we are able to calculate the minimum wage at the provincial level. Having detailed minimum wage information has the advantage that we cannot only have different measures of the regional minimum wage (highest level and lowest level of the minimum wages, in addition to the weighted average of the minimum wage), but also can describe the regional variation more fully. For example, we can calculate the variance (or standard deviation) of the minimum wage within a city or within a province.

Finally, in addition to the absolute value of the minimum wages, we also investigate the relative minimum wage levels, which is the minimum wage divided by the average wage of all the workers in the region. The formula is as follows:

$$MW_{ct} = \frac{\sum_{j \in c} MW_{jct} * employ_{jct} / \sum_{j \in c} employ_{jct}}{AW_c}$$

AW_{ct} is the average wage in city c at time t , which can be obtained from the Chinese City Statistical Yearbook. MW_{jct} and $employ_{jct}$ are as previously defined.

4. Regional variation of minimum wage and its evolution

Before describing the regional variation of the minimum wage, we investigate the trend of minimum wages at the national level. Figure 1 shows that the average minimum wage for the whole nation increased significantly between 2004 and 2010. However, the increase for the minimum wage is relatively slower than that of the wages for urban workers. As a result, the ratio of minimum wage over average wages decreased significantly during this period.

Figure 2 is the scatter of minimum wages over time. Each circle in this figure represents the minimum wage of a county. We can see that the minimum wage varies a lot across regions within China, and that the regional variation does not shrink over time. As the minimum wages are mainly determined by the provincial level government and representatives of the employers and employees, panels B-D investigate the regional variation in the minimum wage at the provincial level, each circle representing one province: panel B is about the average minimum wages, and it shows an increasing variation in the minimum wages over time. Panel C plots the highest minimum wages for each province in different years. There seems no trend of increased dispersion in the minimum wages, which may suggest that the economic developments converge for provincial capital cities. On the other hand, if we look at the lowest minimum wages within each province and look at the regional variation within China, the differential increased significantly during the period we investigated.

Next, we first calculate the average minimum wage for each province and then calculate the regional variation of the minimum wages. The solid line in Figure 3-A shows the standard deviation of the provincial minimum wages in absolute value. It suggests that the regional gaps in minimum wages have increased significantly first in 2004 and then in 2011.² However, if we calculate the standard deviation for the natural log of the minimum wages, the regional variation actually decreased (see the dashed line in Figure 3-A).

Figure 3-B reports the average number of minimum wages applied within a province and such a number for the whole China in each year. The solid line in the figure shows that the number of minimum wages for a representative province decreased significantly. In 2004, an average province applied over five minimum wages, and by 2012 it has decreased to less than four. If we count minimum wages of different levels for China as a whole, the number increased in recent years. This seemingly contradictory phenomenon is caused by the fact that different provinces become less likely to have minimum wages of the same level than before.

Figure 3-C further reports another dimension of the regional variation for the minimum wages, namely the ratio of the highest over the lowest minimum wages (high-to-low or HL ratio) for each province and for China. Again, the regional gap appears to have decreased from the late 1990s. In around 2000, the ratio was 1.5 for an average province and it decreased to 1.3 by 2012. The same pattern is also observed for the whole country, with the ratio decreasing from 3.5 in around 2000 to 2.5 in 2012.

² The pattern does not change if we use the highest or lowest minimum wages within a province.

There is large heterogeneity for different provinces in terms of the regional variation within a province. Table 1 reports the regional gap of minimum wages within each province in 2004 and 2012. In 2004, the minimum wages were low in most provinces, ranging from 253 (Jiangxi province) to 603 (Shanghai) RMB. Guangdong province applied minimum wages of 14 levels: Shenzhen applied the highest minimum wage (607 RMB), while Heyuan applied the lowest (288 RMB), the high-to-low ratio reaching 2.07.³ This is consistent with the fact that the development within Guangdong is regionally unbalanced, with Shenzhen and Guangzhou having high economic growth while other inner cities grew slower. Provinces that applied minimum wages of 10 levels also include Anhui and Liaoning. In 2012, no province had over ten minimum wages. Guangdong applied six, following Anhui (7). The high-to-low ratio also decreased for over two-thirds of the provinces.

We run regressions of the number of minimum wages and the HL ratio within a province on provincial characteristics to explore associated factors, and the results are reported in Table 2. Panel A of Table 2 shows that both measures are positively associated with provincial population, especially in more recent years (2000-2007); they are also positively associated with rural-urban income gap and the degree of openness (measured as the ratio of trade volume over GDP), but the correlations are sometime insignificant and the correlation is stronger in earlier years (1995-1999). These patterns suggest that both the number of minimum wage levels and the HL ratios reflect the regional imbalance (heterogeneity) within a province. Other factors also influence these two measures: GDP per capita are generally positively correlated with the within province variation; the share of tertiary industry are negatively correlated with the within province variation. In the model explaining the number of minimum wage levels, the adjusted R2 is around 15%, suggesting that there are many other factors in play as well. The model is more successful in explaining the HL ratio, but still, the adjusted R2 is only around 30%.

We next consider the relative level of minimum wages, that is the ratio of minimum wage to average wage of this region. The ratio is calculated at the city level: we first calculate the average minimum wage for each city and divided it by the average wage of the same city. We can then calculate the statistics of the relative minimum wage distributions for each province, which are reported in Table 3. The mean relative minimum wage varies a lot across provinces, ranging from 40 percent (like in Shanxi, Hebei) to 20 percent (Beijing) in 2004. The range is around 18-33 percent in 2010.

Similar to the statistics for the absolute value, there is large variation for the relative minimum wage within a province. Take Anhui province for example. In 2004, the minimum wage was only 19.5% of the average wage in the region with lowest relative minimum wage, while the highest ratio was 37%. The within province variations of relative minimum wages also vary considerable across provinces. The province with the largest standard deviation of the relative minimum wage was Hubei in 2004, which is 0.10. Beijing, Tianjin, Shanghai, and Chongqing had the lowest standard deviation, zero. Around two thirds of the provinces experienced decreases in the regional variation between 2004 and 2010.

³ In the end of 2004, the minimum wages applied in Guangzhou and Shenzhen were 684 and 610 RMB, respectively. The new minimum wage in Guangzhou is only applicable after December 1. It was 510 RMB before that date.

We are also interested in the differences in minimum wages between eastern, central and western China. Table 4 reports the average minimum wage for each region between 2004 and 2010. Surprisingly, central, rather than western region had the lowest minimum wages and average wage levels during this period, followed by the west. But relative to the average wages, the minimum wages was the highest in central China.

Which level of the regional variations in minimum wages is more important? To answer this question, we use the method proposed by Helpman et al. (2013) to decompose the variance in the minimum wage into three parts: variance due to provincial differences, city level differences within a province, and county level differences within a city. The results are reported in Table 5. If we look at the minimum wage in absolute terms, over 60% of the variation comes from provincial level difference, and 31% from city level difference. Variation within a city is less important, accounting for less than 10%. This is consistent with the fact that the minimum wages are determined at the provincial level. But if we look at the relative minimum wage, city variation within province becomes the major contributor to the overall regional variation (58%), followed by provincial level differentials (34%).

5. The determinants of minimum wage

What determines minimum wages of different regions? This section explores this question by running regressions of the minimum wages on a set of candidate explanatory variables. As we are mainly using the variables of the city level characteristics from the city statistical yearbook, we have several choices for the dependent variables to be used in the regression. First, we use the log of the highest minimum wage within a city, and the results are reported in columns 1-4 in Table 6.

Economic development seems to be the major factor that influences the minimum wage. In particular, GDP per capita, economic structure (share of the tertiary industry in GDP) and the per capita number of enterprises are strong predictors for the city level minimum wages, and these variables are positively correlated with the minimum wage at the significance level of 1%. The amount of FDI (relative to GDP) is also positively correlated with the minimum wage, but only marginally significant at the 10% level. In the second column, we control for the consumption level in both rural and urban areas within the city. This decreases the number of observations of city-year from 2042 to 1866, but the pattern remains unchanged. The urban consumption level is highly significant. Column 3 controls for provincial dummies, which reduces the magnitude and the significance level of most variables. One major change is that the coefficient on the share of employment in private sectors becomes positive and insignificant rather than being significantly negative. Column 4 further controls for city dummies. Unsurprisingly, most of the coefficients become insignificant.

In columns 5-8, we consider another measure: log of the lowest minimum wage within a city. Without controlling for province dummies, the results are similar to those in columns 1-2, but the effects of those proxy variables for economic development are smaller in magnitude. Another difference is that the lowest minimum wage within a city is positively correlated with the consumption level of the rural areas. These results suggest that the minimum wage is influenced more by the consumption need, rather than the economic development level.

The adjusted R² in Table 6 suggest that the OLS regressions are fairly successful in explaining the variation of the minimum wages. The explanatory power of the model is 80-85% without controlling for regional dummies, and it reaches over 90 percent when provincial dummies are controlled for. The marginal gain in the explanatory power is low if we substitute provincial dummies with city dummies, consistent with the fact that province level difference constitutes the major proportion of the regional variation.

As we included year dummies in our regressions, and the minimum wage increases significantly, it is possible that the year dummies play a major role in explaining the minimum wage. We next run regressions for each year, and without losing important information, we report the results for 2003 and 2009 in Table 7. Column 1 reports the results for 2003. The listed variables altogether can explain half of the variation across cities. However, only two variables (GDP per capita and consumption per capita for urban residents) are significant at the 5% level. Controlling for provincial dummies increased the explanatory power by nearly 40 percent from 0.513 to 0.881 (see column 2). If we use the lowest minimum wage within city as the dependent variable (columns 3-4), GDP per capita becomes less important both in the magnitude and the significance level of its coefficient. The consumption in rural areas becomes significant, regardless of whether we control for provincial dummies. Again, city level characteristics are not enough to capture relevant differences at the province level.

In 2009, the explaining power of these variables reaches 60% when the highest minimum wage within city is used as dependent variable. Controlling for province dummies increases the R-squared to 0.853. It suggests that province level differences become less important, or the differences are highly correlated with the city level characteristics.

Some new patterns emerge as we run regressions for each year. For example, GDP growth rate turns out to be negatively associated with the minimum wage. One explanation for this correlation is that a lower minimum wage is beneficial for GDP growth conditional on the economic development level.

Next we consider the relative minimum wage. We have two alternative dependent variables: The ratio of the highest and the lowest minimum wage within a city to the average wage of that city. The results of using these two measures are similar to each other (See Table 8). Several factors that are positively correlated with the absolute value of the minimum wage turn to be negatively correlated with the relative minimum wage, including the GDP per capita and the per capita consumption of the urban residents. This suggests that the high GDP region have higher average wage, which might be influenced more by the high-income individuals. The fiscal expenditure share in GDP is insignificant in explaining the absolute minimum wage (see Table 6 and Table 7), but it turns negatively correlated with the relative minimum wage in Table 8. The relative number of the scaled enterprises and the share of service sector in GDP are positively correlated with the relative minimum wage. These patterns largely remain when we run regressions for separate years (see Table 9).

It is worth mentioning that we are less successful in explaining the relative minimum wage than in explaining the absolute value of the minimum wage in terms of the adjusted R squared in the OLS regressions. For example, the adjusted R squared is only around 10

percent in the regression for 2009 when the province dummies are not controlled for. Even with the province dummies being controlled for, the explaining power is only around 40-45 percent. However, although some economists suggests using the relative levels of the minimum wages, it is the absolute value that are determined by the tripartite negotiation process.

6. The time to adjust the minimum wages

The new provisions issued in 2004 require the local governments to adjust the minimum wage at least once in every two years. The local governments decide when to do so. It is interesting to see whether the timing of the minimum wage adjustment is related to regional characteristics, and more importantly to minimum wage levels. Two alternative stories can be told.

The first is the race-to-the-bottom story. The local officials compete in GDP growth performance to gain better chance of promotions. If they believe that higher minimum wage drove up labor costs and deterred potential investors and eventually harmed growth, they have incentives to set minimum wages levels lower than competing regions. The results might be that a province that adjusts its minimum wage later would choose lower levels than a similar province that adjusts the minimum wage earlier. The second story, which we heard of often in conversation with officials and scholars, is the keep-up-with-the-Joneses one. Local officials do not want to have minimum wages lower than competing provinces, for several reasons, justified or unjustified. First, higher minimum wage is itself an indicator of better economic performance, which might be valued in official promotions. Second, while seeming unfriendly to employer, it may help a region attract quality workers, which seems to be truly believed by some local officials.⁴ If the keep-up-with-the-Joneses hypothesis is true, provinces adjusting their minimum wages later should choose higher minimum wages. We test these hypotheses in the following.

Table 10 reports the number of provinces that implement new minimum wages in each month from 1995 to 2007. There is considerable variation in the time chosen for new minimum wages, and also the variation changed from 1995 to 2007. In earlier years, most local governments chose January and July, the starting point of a year or the half year. From around 2003, more provinces choose the last two quarters in a year to implement their new minimum wages. A regression of the month of adjustment on year gives a coefficient of 0.25 (the standard error being 0.04). This might be due to the fact that local governments compete on minimum wage levels, as waiting allows them to observe the action of other provinces.

Although the month of updating minimum wage levels becomes later, there is no consistent evidence showing a systematic relationship between the month of adjustment and various factors. In Table 11, we report regression results where we regress the month of minimum wage adjustment on a set of variables. No variables are significant in all the specifications, and there is weak evidence showing that province with higher GDP, higher fiscal expenditure, and larger service sector tend to adjust their minimum wages later.

⁴ Among the five reasons to raise minimum wage in 2008, local officials in Shenzhen point out that raising minimum wage will help them attract skilled workers. (http://sztqb.sznews.com/html/2008-06/03/content_199567.htm accessed on 2014-12-17).

Are there any relationships between the month of minimum wage adjustment and minimum wage levels? This question was partly inspired by a conversation to a government official in Shenzhen. He said Shenzhen raised its minimum wage to 1600 Yuan/month in February 2013, which was overtaken by Shanghai in April. But the differential is only 20 Yuan, which is symbolic rather than substantive. Table 12 provides a rigorous empirical study, where we regress the level of minimum wages on the month of minimum wage adjustment as well as a set of other control variables. In the first row, we use the highest level of minimum wage within a city as the dependent variable. The results suggest that regions adjusting their minimum wages later tend to have slightly higher minimum wages. In the second row, we use the natural log of the highest minimum wage within a city as the dependent variable. Again, the coefficients on the month of minimum wage adjustment is significantly positive, but small in magnitude, none of them greater than 1 percent. In panel C, we use relative minimum wage (the ratio of the highest minimum wage within a city to the average wage of the city) as dependent variable, and we get similar results. Using the lowest minimum wage within a city (panels D to E) produces similar results.

These results indicates that local government want to keep-up-with-the-Joneses, but at the same time, they do not want to raise minimum wages too much higher than other provinces with the risk of damaging growth.

7. Discussions and implications

Our findings have major implications for making predictions about the regional variation in minimum wages in the future. The basic pattern we observe is that the regional variation, although large, has been declining. A question then emerges: will the regional variation continues to decrease? The answer seems to be yes, for the following reasons. First, the simple extrapolation of the existing trend predicts fewer levels of minimum wages within a province and declining HL ratios both within a province and within the whole country. If we assume a linear trend in the number of the minimum wages within a province, the number will decrease to around 3 by 2020, and the HL ratio will decrease to around 1.2. Second, this prediction is supported by our regression results as well (see Table 2). For the HL ratio results in particular, the share of the tertiary sector in GDP is negatively correlated with the HL ratio, and the trade share and the rural-urban income gap (the latter not being significant for the period 2000-2007) are positively correlated with the HL ratio. The most possible changing direction of these factors points to a decreased regional variation. The share of the tertiary sector will increase continuously, leading to lower HL ratio within a province. Meanwhile, China will become less dependent on export to boost its economy, and the rural-urban income gap has shown a declining trend. Both suggest lower within-province HL ratio in the future.

What about the regional difference in the minimum wage for the whole country? Although the number of minimum wage levels shows no consistent trend, the HL ratio decreases significantly. This is consistent with the two following closely related facts. (1) The regional wage gaps for unskilled workers decreased in recent years. Whalley and Xing (2014) show that while the wage gaps across province for skilled workers increased significantly between 2002 and 2007, those of the unskilled workers decreased. (2) The movement (mobility) of the unskilled workers seems more responsive to location specific

shocks. These two facts indicate that the minimum wage will converge between provinces.

The above findings and predictions indicate important policy implications for the Chinese government. One question that should be raised is: Do we need the minimum wage to vary across regions? If the minimum wage will not vary too much across province in the future, the central government and the representatives of the employers and employees at the national level might play a larger role. This of course does not necessarily mean a unique national minimum wage, because the central government and the representatives of the employers and employees can also use local statistics to produce minimum wages for different regions. This seems plausible as our model for explaining the minimum wage seems to be relatively successful. This institutional change can also be expected to change the gaming behavior between provinces in the minimum wage adjustment process.

If the minimum wages do not vary (much) across regions, should it vary in other dimensions? At least several dimensions could be considered, including industry, gender, education, and age. These dimensions are not only practically in use in some other countries, but also income gaps along these dimensions have either increase dramatically or remain high in recent years in China. For example, a recent study by Wei and Xing (2014) shows that the wage differential between young workers of age 22-24 and prime age workers in their age 40s has increased dramatically. So the minimum wage should be either more targeted to young workers, or vary according to age.

8. Conclusions

China is a large country with economic development level varying substantially across regions. China decentralizes the implementation of the minimum wage policy, leading to large regional variation in minimum wages. But the regional gap in minimum wages seems to have declined and will probably continue to decrease. This trend may suggest possible reform on the institutional arrangement of China's minimum wage policy.

One possible direction is the centralization of the minimum wage setting. Another direction is to allow minimum wage to vary by industry, age, gender, or education. Both possibilities have not been fully discussed in current China. One major aim of this paper is to put these questions on table for discussion.

It also brings some questions for future research. Disregarding whether we centralize or decentralize the minimum wage policy, the incentives of the local government and their interactions are important for us to understand the implementation of the minimum wage policy. Unfortunately, little is known yet. Another question concerns the bargaining in minimum wage setting, that is, whether a national minimum wage by industry may have the advantage that both employers and employees within an industry are easier to get organized than those from different industries within a province? If the answer is yes, a national minimum wage by industry will be more plausible than if the answer is no.

The emerging literature on minimum wage policy in China reflects a growing demand for redefining the labor relations in the Chinese labor market. Minimum wage policies, along with unions, and collective bargaining are discussed more often than

ever in both academia and public policies. Although there are many studies showing the impact of China's minimum wage policy on wages, employment, and inequality, large or small, significant or insignificant, expected or unexpected, our faith is that the significant increase in the minimum wage is mainly a reflection rather than a cause of the rapid increase in wages, which seems to be supported by our empirical evidence.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

CX and JX designed this research jointly. CX prepared the literature review of this paper, and drafted the whole paper. JX initiated the project, designed this research, and performed data analysis.

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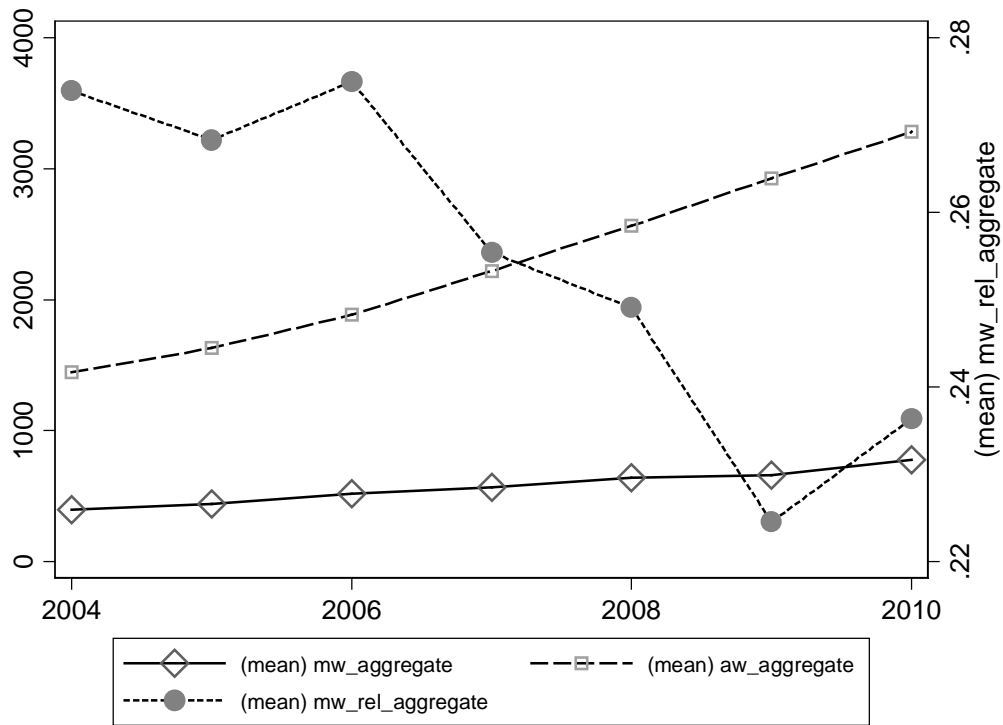


Figure 1 Minimum Wage and Average Wage for China, 2004-2010

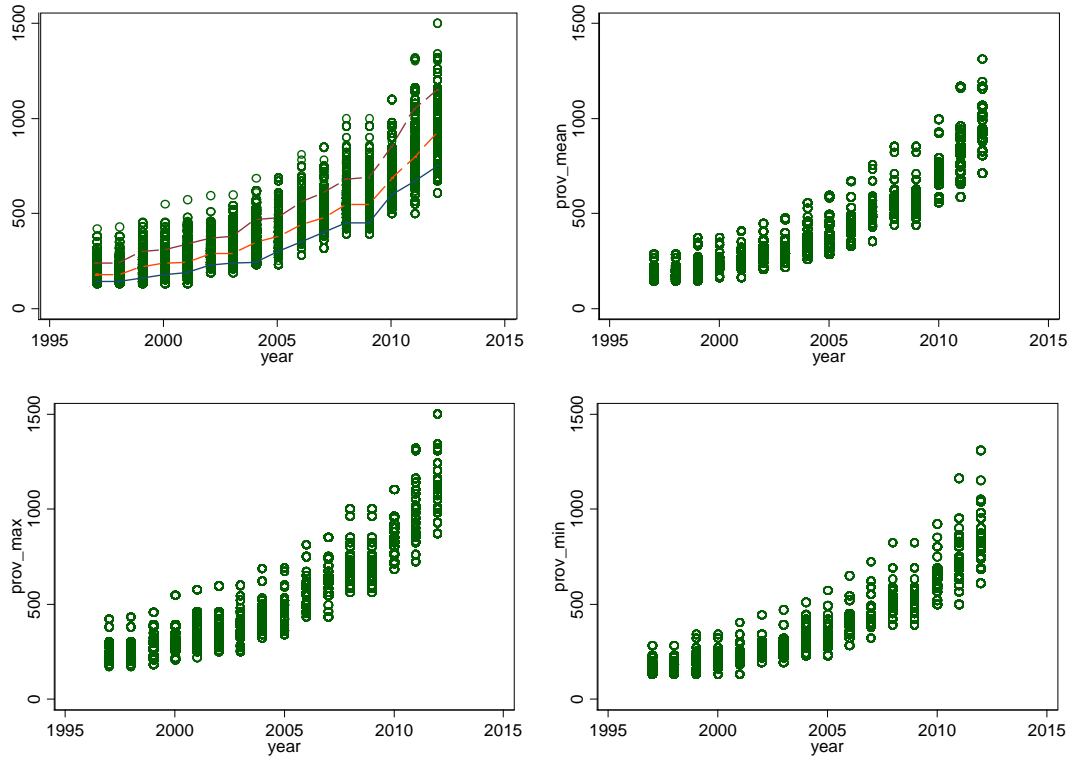


Figure 2 Regional Minimum Wage

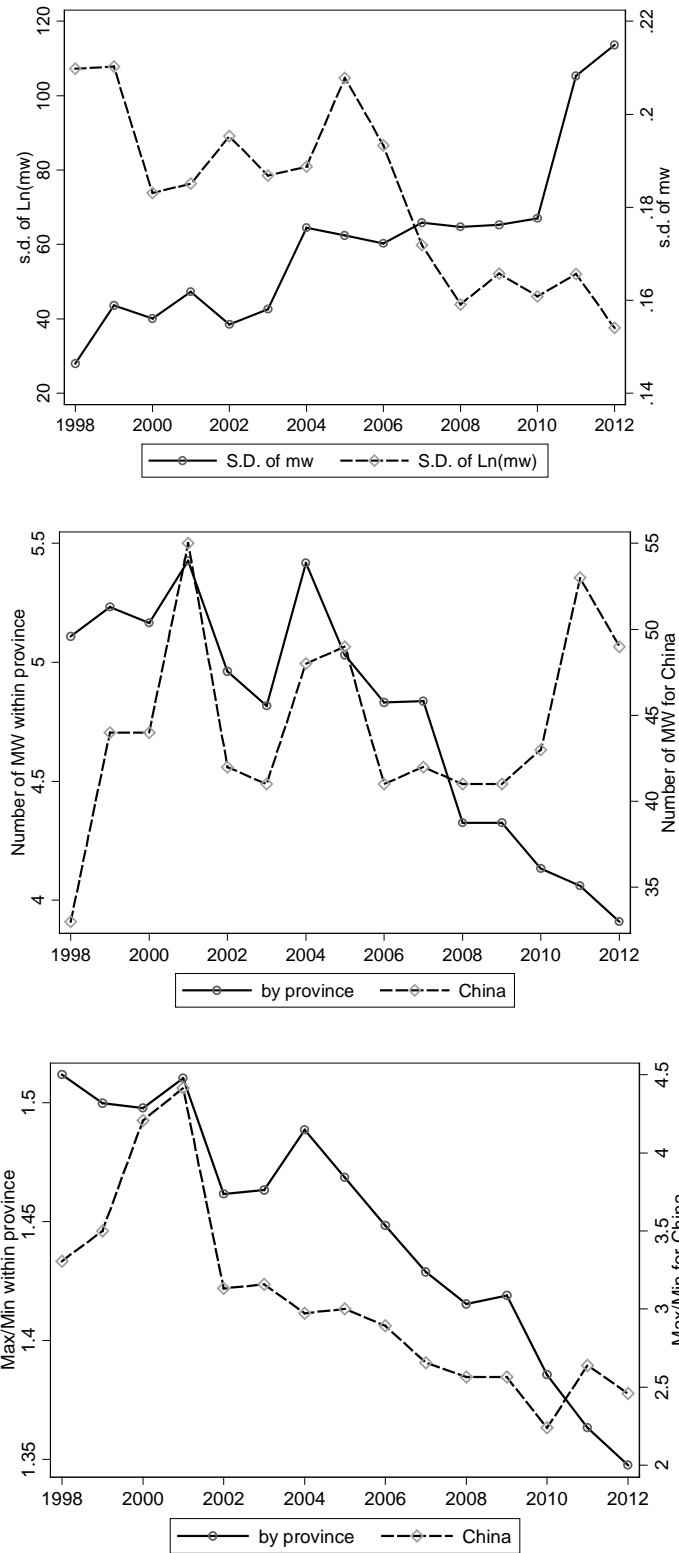


Figure 3 Regional Variation of Minimum Wages within Province and within China

Table 1 Minimum wages by province, 2004 and 2012.

| Province | 2004 | | | | | 2012 | | | | |
|----------------|---------|-----|-----|---------|----------|---------|------|------|---------|----------|
| | Average | Max | Min | # of mw | Max /Min | Average | Max | Min | # of mw | Max /Min |
| Anhui | 312 | 410 | 290 | 10 | 1.52 | 712 | 1010 | 680 | 7 | 1.49 |
| Beijing | 495 | 495 | 495 | 1 | 1.00 | 1260 | 1260 | 1260 | 1 | 1.00 |
| Fujian | 324 | 480 | 280 | 7 | 1.71 | 897 | 1200 | 830 | 4 | 1.45 |
| Gansu | 304 | 340 | 300 | 3 | 1.13 | 839 | 980 | 860 | 4 | 1.14 |
| Guangdong | 369 | 684 | 330 | 14 | 2.07 | 925 | 1500 | 850 | 6 | 1.76 |
| Guangxi | 330 | 460 | 320 | 4 | 1.44 | 819 | 1000 | 690 | 4 | 1.45 |
| Guizhou | 309 | 400 | 320 | 3 | 1.25 | 801 | 930 | 740 | 3 | 1.26 |
| Hainan | 358 | 500 | 350 | 3 | 1.43 | 788 | 1050 | 900 | 3 | 1.17 |
| Hebei | 376 | 520 | 420 | 3 | 1.24 | 1058 | 1320 | 1040 | 4 | 1.27 |
| Henan | 257 | 380 | 240 | 3 | 1.58 | 913 | 1080 | 820 | 3 | 1.32 |
| Heilongjiang | 288 | 390 | 235 | 7 | 1.66 | 677 | 1160 | 850 | 4 | 1.36 |
| Hubei | 277 | 400 | 240 | 5 | 1.67 | 827 | 1100 | 750 | 3 | 1.47 |
| Hunan | 346 | 460 | 320 | 7 | 1.44 | 885 | 1160 | 870 | 4 | 1.33 |
| Jilin | 323 | 360 | 300 | 3 | 1.20 | 919 | 1150 | 950 | 3 | 1.21 |
| Jiangsu | 425 | 620 | 360 | 4 | 1.72 | 997 | 1320 | 950 | 3 | 1.39 |
| Jiangxi | 253 | 360 | 270 | 4 | 1.33 | 715 | 870 | 610 | 5 | 1.43 |
| Liaoning | 288 | 440 | 230 | 11 | 1.91 | 891 | 1100 | 780 | 5 | 1.41 |
| Inner Mongolia | 344 | 420 | 380 | 3 | 1.11 | 962 | 1200 | 900 | 4 | 1.33 |
| Ningxia | 342 | 380 | 320 | 3 | 1.19 | 960 | 1100 | 950 | 3 | 1.16 |
| Qinghai | 264 | 370 | 330 | 4 | 1.12 | 924 | 1070 | 1050 | 3 | 1.02 |
| Shandong | 356 | 410 | 290 | 5 | 1.41 | 1044 | 1240 | 950 | 3 | 1.31 |
| Shanxi | 355 | 520 | 400 | 4 | 1.30 | 906 | 1125 | 855 | 4 | 1.32 |
| Shaanxi | 275 | 320 | 245 | 4 | 1.31 | 881 | 1000 | 790 | 4 | 1.27 |
| Shanghai | 603 | 635 | 635 | 1 | 1.00 | 1408 | 1450 | 1450 | 1 | 1.00 |
| Sichuan | 270 | 450 | 230 | 7 | 1.96 | 891 | 1050 | 800 | 4 | 1.31 |
| Tianjin | 501 | 530 | 510 | 2 | 1.04 | 1273 | 1310 | 1310 | 1 | 1.00 |
| Tibet | 306 | 495 | 445 | 3 | 1.11 | 1171 | 1200 | 1150 | 2 | 1.04 |
| Xinjiang | 325 | 480 | 300 | 9 | 1.60 | 949 | 1340 | 980 | 4 | 1.37 |
| Yunnan | 304 | 470 | 350 | 3 | 1.34 | 949 | 1100 | 830 | 3 | 1.33 |
| Zhejiang | 491 | 620 | 440 | 4 | 1.41 | 1170 | 1310 | 950 | 4 | 1.38 |
| Chongqing | 342 | 400 | 330 | 4 | 1.21 | 931 | 1050 | 950 | 2 | 1.11 |
| Average | | | | 4.81 | 1.40 | | | | 3.48 | 1.28 |

Table 2 Explaining the number of minimum wage levels and the high/low ratio within province

| | Number of mw | | | Max/min | | |
|------------------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | 1995-07 | 1995-1999 | 2000-07 | 1995-07 | 1995-1999 | 2000-07 |
| Ln(population) | 0.810*** (0.223) | 0.226 (0.396) | 1.043*** (0.310) | 0.121*** (0.0229) | 0.0587 (0.0422) | 0.150*** (0.0295) |
| Ln(GDP per capita) | 1.276* (0.712) | 2.231* (1.158) | 0.783 (0.966) | 0.0782 (0.0730) | 0.169 (0.124) | -0.00300 (0.0917) |
| Tertiary sector share in GDP | -5.765* (2.995) | -3.995 (5.997) | -6.981* (3.678) | -0.291 (0.307) | 0.471 (0.640) | -0.817** (0.349) |
| Urban-rural income gap | 0.759** (0.327) | 1.574*** (0.546) | 0.369 (0.426) | 0.0574* (0.0335) | 0.145** (0.0583) | 0.000945 (0.0405) |
| Ln(average wage) | -2.437* (1.292) | -3.066 (2.114) | -1.463 (1.752) | -0.419*** (0.132) | -0.743*** (0.226) | -0.121 (0.166) |
| Trade share in GDP | 1.218* (0.656) | 2.159 (1.335) | 0.986 (0.769) | 0.327*** (0.0673) | 0.719*** (0.143) | 0.202*** (0.0730) |
| Fiscal expenditure in GDP | 2.618 (2.526) | -1.328 (6.004) | 3.573 (3.171) | 0.503* (0.259) | 0.689 (0.641) | 0.496 (0.301) |
| Fixed investment/GDP | -1.542 (1.511) | -8.145** (3.564) | -0.750 (1.951) | -0.215 (0.155) | -0.988** (0.381) | -0.203 (0.185) |
| N | 365 | 141 | 224 | 365 | 141 | 224 |
| Adj-R2 | 0.146 | 0.136 | 0.153 | 0.284 | 0.299 | 0.349 |

Table 3 Minimum wages relative to average wages by province, 2004 and 2010.

| | 2004 | | | | | 2010 | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Min | Max | Mean | Media | S.D. | Min | Max | Mean | Media | S.D. |
| Anhui | 0.195 | 0.368 | 0.292 | 0.292 | 0.044 | 0.161 | 0.264 | 0.207 | 0.207 | 0.028 |
| Beijing | 0.198 | 0.198 | 0.198 | 0.198 | 0.000 | 0.173 | 0.173 | 0.173 | 0.173 | 0.000 |
| Fujian | 0.208 | 0.311 | 0.245 | 0.245 | 0.032 | 0.212 | 0.335 | 0.259 | 0.259 | 0.042 |
| Gansu | 0.183 | 0.459 | 0.303 | 0.303 | 0.077 | 0.184 | 0.370 | 0.283 | 0.283 | 0.067 |
| Guangdong | 0.197 | 0.420 | 0.286 | 0.286 | 0.067 | 0.205 | 0.344 | 0.260 | 0.260 | 0.040 |
| Guangxi | 0.261 | 0.373 | 0.320 | 0.320 | 0.038 | 0.216 | 0.502 | 0.274 | 0.274 | 0.073 |
| Guizhou | 0.307 | 0.342 | 0.324 | 0.324 | 0.016 | 0.263 | 0.303 | 0.280 | 0.280 | 0.017 |
| Hainan | 0.341 | 0.411 | 0.376 | 0.376 | 0.050 | 0.291 | 0.298 | 0.295 | 0.295 | 0.005 |
| Hebei | 0.310 | 0.439 | 0.375 | 0.375 | 0.037 | 0.234 | 0.298 | 0.262 | 0.262 | 0.022 |
| Henan | 0.184 | 0.378 | 0.269 | 0.269 | 0.056 | 0.226 | 0.378 | 0.295 | 0.295 | 0.039 |
| Heilongjiang | 0.186 | 0.529 | 0.314 | 0.314 | 0.091 | 0.215 | 0.458 | 0.289 | 0.289 | 0.078 |
| Hubei | 0.171 | 0.589 | 0.310 | 0.310 | 0.100 | 0.244 | 0.651 | 0.332 | 0.332 | 0.109 |
| Hunan | 0.257 | 0.473 | 0.315 | 0.315 | 0.058 | 0.201 | 0.331 | 0.268 | 0.268 | 0.039 |
| Jilin | 0.204 | 0.441 | 0.326 | 0.326 | 0.082 | 0.253 | 0.411 | 0.319 | 0.319 | 0.057 |
| Jiangsu | 0.220 | 0.359 | 0.299 | 0.299 | 0.040 | 0.199 | 0.245 | 0.222 | 0.222 | 0.015 |
| Jiangxi | 0.228 | 0.433 | 0.303 | 0.303 | 0.053 | 0.213 | 0.303 | 0.255 | 0.255 | 0.030 |
| Liaoning | 0.177 | 0.351 | 0.234 | 0.234 | 0.047 | 0.172 | 0.335 | 0.261 | 0.261 | 0.040 |
| Inner Mongolia | 0.268 | 0.422 | 0.347 | 0.347 | 0.058 | 0.196 | 0.350 | 0.268 | 0.268 | 0.045 |
| Ningxia | 0.239 | 0.329 | 0.293 | 0.293 | 0.036 | 0.177 | 0.250 | 0.222 | 0.222 | 0.029 |
| Qinghai | 0.238 | 0.238 | 0.238 | 0.238 | 0.000 | 0.269 | 0.269 | 0.269 | 0.269 | 0.000 |
| Shandong | 0.158 | 0.365 | 0.289 | 0.289 | 0.048 | 0.217 | 0.350 | 0.256 | 0.256 | 0.031 |
| Shanxi | 0.344 | 0.554 | 0.412 | 0.412 | 0.063 | 0.184 | 0.355 | 0.272 | 0.272 | 0.049 |
| Shaanxi | 0.220 | 0.300 | 0.272 | 0.272 | 0.024 | 0.196 | 0.294 | 0.238 | 0.238 | 0.027 |
| Shanghai | 0.254 | 0.254 | 0.254 | 0.254 | 0.000 | 0.187 | 0.187 | 0.187 | 0.187 | 0.000 |
| Sichuan | 0.185 | 0.338 | 0.244 | 0.244 | 0.039 | 0.195 | 0.358 | 0.281 | 0.281 | 0.038 |
| Tianjin | 0.283 | 0.283 | 0.283 | 0.283 | 0.000 | 0.208 | 0.208 | 0.208 | 0.208 | 0.000 |
| Xinjiang | 0.249 | 0.281 | 0.265 | 0.265 | 0.023 | 0.233 | 0.299 | 0.266 | 0.266 | 0.046 |
| Yunnan | 0.210 | 0.437 | 0.307 | 0.307 | 0.068 | 0.203 | 0.355 | 0.256 | 0.256 | 0.051 |
| Zhejiang | 0.221 | 0.320 | 0.275 | 0.275 | 0.032 | 0.220 | 0.355 | 0.279 | 0.279 | 0.039 |
| Chongqing | 0.277 | 0.277 | 0.277 | 0.277 | 0.000 | 0.186 | 0.186 | 0.186 | 0.186 | 0.000 |

Table 4 (Relative) minimum wages by region

| year | Monthly MW | | | Monthly Wage | | | MW/Monthly Wage | | |
|------|------------|---------|------|--------------|---------|------|-----------------|---------|-------|
| | EAST | CENTRAL | WEST | EAST | CENTRAL | WEST | EAST | CENTRAL | WEST |
| 2004 | 448 | 344 | 351 | 1673 | 1171 | 1305 | 0.268 | 0.294 | 0.273 |
| 2005 | 503 | 378 | 389 | 1882 | 1340 | 1455 | 0.267 | 0.282 | 0.261 |
| 2006 | 586 | 419 | 472 | 2125 | 1533 | 1748 | 0.276 | 0.273 | 0.274 |
| 2007 | 635 | 503 | 515 | 2505 | 1833 | 2038 | 0.253 | 0.274 | 0.248 |
| 2008 | 715 | 557 | 574 | 2893 | 2117 | 2354 | 0.247 | 0.263 | 0.244 |
| 2009 | 725 | 543 | 578 | 3214 | 2340 | 2694 | 0.225 | 0.232 | 0.214 |
| 2010 | 869 | 706 | 746 | 3619 | 2786 | 3076 | 0.240 | 0.253 | 0.220 |

Table 5 Decomposing the regional variation of minimum wages

| | Variation across province | City variation within province | Country variation within city |
|---------------------------|---------------------------|--------------------------------|-------------------------------|
| Minimum Wage | 60.40% | 30.75% | 8.86% |
| Average Wage | 39.23% | 60.77% | 0.00% |
| Minimum Wage/Average Wage | 33.93% | 58.13% | 7.93% |

Table 6 The determinants of the minimum wages at the city level, OLS

| | Dep var.= | | | | | | | |
|----------------------------------|---|-------------------------|-----------------------|-----------------------|--|-------------------------|-----------------------|-----------------------|
| | Log(highest minimum wage within a city) | | | | Log(lowest minimum wage within a city) | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Ln(GDP per capita) | 0.138*** (0.0239) | 0.103*** (0.0328) | 0.0389*** (0.0138) | 0.00738 (0.0216) | 0.128*** (0.0229) | 0.0711** (0.0311) | 0.0147 (0.0205) | -0.00956 (0.0298) |
| Employment rate | -0.120 (0.162) | -0.152 (0.191) | 0.0292 (0.0879) | 0.0314 (0.174) | -0.212 (0.138) | -0.234 (0.168) | 0.0365 (0.116) | 0.0433 (0.229) |
| GDP growth rate | -0.221* (0.113) | -0.272** (0.115) | -0.118* (0.0675) | -0.00639 (0.0832) | -0.0390 (0.145) | -0.174 (0.163) | -0.0834 (0.0950) | 0.0120 (0.0920) |
| Tertiary sector share | 0.280*** (0.0672) | 0.225*** (0.0731) | 0.0680** (0.0287) | -0.136 (0.0897) | 0.262*** (0.0919) | 0.181* (0.0941) | -0.0252 (0.0551) | -0.102 (0.117) |
| Private employment share | -0.137 (0.0934) | -0.244** (0.0922) | 0.0378 (0.0459) | -0.0249 (0.0580) | -0.105 (0.127) | -0.196 (0.120) | 0.0150 (0.0629) | 0.0259 (0.0535) |
| FDI share in GDP | 0.515* (0.276) | 0.394 (0.316) | 0.401* (0.198) | 0.166 (0.124) | 0.429 (0.384) | 0.173 (0.400) | 0.361 (0.265) | 0.299 (0.190) |
| Fiscal expenditure/GDP | -0.138 (0.161) | -0.0891 (0.154) | -0.119* (0.0656) | -0.0815 (0.111) | 0.164 (0.174) | 0.191 (0.159) | 0.114* (0.0604) | -0.0433 (0.133) |
| Service sector/GDP | 0.867 (1.184) | 0.663 (1.073) | 0.0892 (0.586) | -0.203 (0.684) | 0.327 (1.361) | 0.675 (1.334) | -0.0169 (0.538) | 0.178 (0.844) |
| Per capita number of enterprises | 0.0159*** (0.00360) | 0.00916*** (0.00303) | 0.00186* (0.00102) | -0.00475 (0.00400) | 0.0200*** (0.00437) | 0.00944*** (0.00336) | 0.00323 (0.00208) | -0.00573 (0.00546) |
| Ln(consumption per capita)_rural | | 0.00858 (0.0434) | 0.0323 (0.0194) | 0.00291 (0.0370) | | 0.110** (0.0468) | 0.0993*** (0.0292) | 0.0643 (0.0519) |
| Ln(consumption per capita)_urban | | 0.258*** (0.0712) | 0.217*** (0.0394) | 0.0491 (0.0682) | | 0.252*** (0.0796) | 0.151*** (0.0361) | 0.0407 (0.0773) |
| Province dummies | no | no | yes | no | no | no | yes | no |
| City dummies | no | no | no | yes | no | no | no | yes |
| Year dummies | yes | yes | yes | yes | yes | yes | yes | yes |
| N | 2042 | 1866 | 1866 | 1866 | 2042 | 1866 | 1866 | 1866 |
| Adj. R-sq | 0.846 | 0.858 | 0.933 | 0.951 | 0.791 | 0.819 | 0.909 | 0.940 |

Table 7 The determinants of minimum wages in 2003 and 2009, OLS

| | 2003 | | | | 2009 | | | |
|----------------------------------|---------------------|----------------------|----------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|
| | max | max | min | min | max | max | min | min |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Ln(GDP per capita) | 0.109** (0.0409) | 0.0494** (0.0209) | 0.0818* (0.0479) | 0.0230 (0.0239) | 0.115*** (0.0287) | 0.0502** (0.0183) | 0.0802** (0.0297) | 0.0307 (0.0217) |
| Employment rate | -0.484* (0.274) | -0.203 (0.169) | -0.612* (0.318) | -0.141 (0.124) | 0.0778 (0.177) | 0.140 (0.0876) | 0.193 (0.199) | 0.167 (0.142) |
| GDP growth rate | -0.448 (0.322) | -0.232* (0.129) | -0.260 (0.352) | -0.00420 (0.133) | -0.666*** (0.197) | -0.221*** (0.0708) | -0.570** (0.220) | -0.318* (0.183) |
| Tertiary sector share | 0.0458 (0.0981) | -0.00792 (0.0582) | 0.0403 (0.135) | -0.0464 (0.0486) | 0.367*** (0.0948) | 0.155*** (0.0558) | 0.324** (0.126) | 0.0729 (0.105) |
| Private employment share | -0.104 (0.272) | 0.0834 (0.132) | -0.260 (0.341) | -0.209** (0.0867) | -0.278** (0.109) | -0.0547 (0.0688) | -0.134 (0.135) | 0.0402 (0.0923) |
| FDI share in GDP | 0.524 (0.387) | 0.656*** (0.206) | 0.330 (0.415) | 0.700*** (0.234) | -0.266 (0.383) | 0.113 (0.205) | -0.818* (0.415) | -0.0560 (0.327) |
| Fiscal expenditure/GDP | -0.197 (0.314) | -0.154 (0.144) | 0.349 (0.313) | 0.133 (0.114) | -0.0715 (0.104) | -0.0678 (0.0940) | 0.130 (0.0990) | 0.0892 (0.0873) |
| Service sector/GDP | 0.612 (2.133) | 0.811 (0.809) | -0.500 (2.090) | 0.737 (0.597) | 0.599 (0.806) | -0.362 (0.799) | -0.501 (1.350) | -0.768 (1.056) |
| Per capita number of enterprises | 0.0109 (0.00869) | 0.00512 (0.00405) | 0.00890 (0.00884) | 0.00940** (0.00454) | 0.0101*** (0.00345) | 0.00331** (0.00142) | 0.0108*** (0.00391) | 0.00490* (0.00264) |
| Ln(consumption per capita)_rural | 0.0135 (0.0429) | -0.00786 (0.0303) | 0.119** (0.0519) | 0.103** (0.0437) | 0.00467 (0.0428) | 0.0415 (0.0248) | 0.100* (0.0529) | 0.0944** (0.0381) |
| Ln(consumption per capita)_urban | 0.245** (0.109) | 0.192*** (0.0602) | 0.293** (0.124) | 0.0563 (0.0607) | 0.110 (0.0736) | 0.157*** (0.0381) | 0.0690 (0.0869) | 0.0572 (0.0488) |
| prov | no | yes | no | yes | no | yes | no | yes |
| N | 240 | 240 | 240 | 240 | 262 | 262 | 262 | 262 |
| Adj. R-sq | 0.513 | 0.881 | 0.479 | 0.899 | 0.591 | 0.853 | 0.460 | 0.763 |

Table 8 The determinants of the *relative* minimum wages, OLS

| | Dep var.= | | | | Log(highest minimum wage within a city/average wage) | | | |
|----------------------------------|--|-------------------------|---------------------------|-------------------------|--|--------------------------|----------------------------|------------------------|
| | Log(highest minimum wage within a city/average wage) | | | | Log(highest minimum wage within a city/average wage) | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Ln(GDP per capita) | -0.00458*** (0.000465) | -0.00126 (0.000787) | -0.00324*** (0.000687) | -0.000811 (0.000875) | -0.00447*** (0.000421) | -0.00168* (0.000944) | -0.00336*** (0.000606) | -0.00111 (0.000941) |
| Employment rate | 0.00127 (0.00485) | 0.0118 (0.00890) | -0.00278 (0.00605) | 0.00690 (0.0115) | 0.00106 (0.00396) | 0.0143* (0.00805) | -0.00144 (0.00523) | 0.00712 (0.0109) |
| GDP growth rate | -0.00330 (0.00449) | -0.00552 (0.00359) | -0.00269 (0.00446) | -0.00405 (0.00378) | -0.00269 (0.00414) | -0.00489 (0.00329) | -0.00189 (0.00405) | -0.00362 (0.00342) |
| Tertiary sector share | -0.00146 (0.00193) | -0.00446 (0.00322) | -0.00133 (0.00196) | -0.00368 (0.00342) | -0.00274 (0.00195) | -0.00268 (0.00350) | -0.00268 (0.00194) | -0.00202 (0.00356) |
| Private employment share | -0.00199 (0.00178) | -0.00185 (0.00280) | -0.000602 (0.00187) | -0.00271 (0.00362) | -0.00303* (0.00169) | -0.00114 (0.00240) | -0.00124 (0.00195) | -0.00163 (0.00298) |
| FDI share in GDP | 0.00755 (0.00470) | 0.00387 (0.00523) | 0.00944* (0.00513) | -0.000662 (0.00547) | 0.00763 (0.00516) | 0.00721 (0.00553) | 0.00874 (0.00567) | 0.00220 (0.00585) |
| Fiscal expenditure/GDP | -0.0124*** (0.00377) | -0.0113*** (0.00326) | -0.0123*** (0.00338) | -0.00783** (0.00357) | -0.00697* (0.00379) | -0.00885*** (0.00310) | -0.00652* (0.00325) | -0.00629* (0.00338) |
| Service sector/GDP | 0.0181 (0.0308) | 0.00900 (0.0508) | 0.0442 (0.0358) | 0.0190 (0.0556) | 0.0124 (0.0228) | 0.0000916 (0.0459) | 0.0342 (0.0279) | 0.0197 (0.0501) |
| Per capita number of enterprises | 0.000289*** (0.0000956) | 0.000206 (0.000146) | 0.000334*** (0.000105) | 0.000194 (0.000177) | 0.000303*** (0.0000655) | 0.000162 (0.000134) | 0.000325*** (0.0000677) | 0.000142 (0.000170) |
| Ln(consumption per capita)_rural | | | -0.000166 (0.000949) | -0.000602 (0.00203) | | | 0.00122 (0.00101) | 0.000700 (0.00215) |
| Ln(consumption per capita)_urban | | | -0.00456** (0.00206) | -0.00631** (0.00305) | | | -0.00531*** (0.00159) | -0.00552* (0.00297) |
| Province dummies | no | yes | no | yes | no | yes | no | yes |
| N | 2033 | 2033 | 1862 | 1862 | 2033 | 2033 | 1862 | 1862 |
| Adj. R-sq | 0.260 | 0.432 | 0.263 | 0.390 | 0.273 | 0.459 | 0.247 | 0.396 |

Table 9 The determinants of the relative minimum wages in 2003 and 2009, OLS

| | 2003 | | | | 2009 | | | |
|----------------------------------|-------------------------|-------------------------|-------------------------|---------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | max | max | min | min | max | max | min | min |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Ln(GDP per capita) | -0.0000853 (0.00131) | -0.00216** (0.00101) | -0.000730 (0.000992) | -0.00257*** (0.000732) | -0.00241** (0.000877) | -0.00374*** (0.000869) | -0.00280*** (0.000723) | -0.00368*** (0.000792) |
| Employment rate | -0.0242** (0.0104) | -0.0163** (0.00744) | -0.0224** (0.00847) | -0.0111* (0.00561) | 0.00448 (0.00517) | 0.000359 (0.00615) | 0.00641 (0.00518) | 0.00170 (0.00531) |
| GDP growth rate | -0.0109 (0.0118) | -0.00231 (0.00807) | -0.00476 (0.0103) | 0.00356 (0.00706) | 0.000781 (0.00827) | 0.00807 (0.00748) | 0.00361 (0.00852) | 0.00534 (0.00719) |
| Tertiary sector share | -0.00402 (0.00317) | -0.00193 (0.00319) | -0.00290 (0.00297) | -0.00164 (0.00247) | -0.00279 (0.00453) | -0.00529* (0.00293) | -0.00296 (0.00369) | -0.00583** (0.00263) |
| Private employment share | 0.00403 (0.00745) | 0.000513 (0.00348) | -0.000623 (0.00717) | -0.00600** (0.00288) | -0.00886*** (0.00245) | -0.00528* (0.00259) | -0.00493* (0.00274) | -0.00291 (0.00272) |
| FDI share in GDP | 0.0223 (0.0135) | 0.0104 (0.00958) | 0.0162 (0.0118) | 0.0101 (0.00717) | 0.00870 (0.0123) | 0.00822 (0.0113) | -0.00162 (0.0101) | 0.00441 (0.00866) |
| Fiscal expenditure/GDP | -0.0260*** (0.00821) | -0.0218*** (0.00748) | -0.0123* (0.00671) | -0.0140** (0.00554) | -0.00689 (0.00467) | -0.00537 (0.00417) | -0.00301 (0.00411) | -0.00215 (0.00436) |
| Service sector/GDP | 0.0935 (0.0574) | 0.0833* (0.0415) | 0.0534 (0.0433) | 0.0675* (0.0336) | 0.0998* (0.0516) | 0.106*** (0.0358) | 0.0595 (0.0471) | 0.0810** (0.0331) |
| Per capita number of enterprises | 0.000392 (0.000238) | 0.000558* (0.000287) | 0.000312* (0.000168) | 0.000602*** (0.000175) | 0.000330*** (0.0000752) | 0.000270*** (0.0000770) | 0.000295*** (0.0000761) | 0.000272*** (0.0000682) |
| Ln(consumption per capita)_rural | -0.000874 (0.00180) | -0.000248 (0.00187) | 0.00172 (0.00173) | 0.00235 (0.00181) | -0.00288** (0.00115) | -0.00153 (0.00116) | -0.000929 (0.00129) | -0.000476 (0.00129) |
| Ln(consumption per capita)_urban | -0.0125*** (0.00336) | -0.0102** (0.00381) | -0.0104*** (0.00313) | -0.0123*** (0.00299) | -0.00152 (0.00175) | 0.000929 (0.00240) | -0.00160 (0.00202) | -0.000933 (0.00212) |
| prov | no | yes | no | yes | no | yes | no | yes |
| N | 240 | 240 | 240 | 240 | 258 | 258 | 258 | 258 |
| Adj. R-sq | 0.251 | 0.488 | 0.234 | 0.529 | 0.135 | 0.450 | 0.095 | 0.401 |

Table 10 Month when new minimum wage implemented

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| January | 12 | 7 | 8 | 8 | 4 | 4 | 3 | 5 | 6 | 6 | 5 | 1 | 3 |
| February | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| March | 0 | 0 | 1 | 1 | 1 | 3 | 4 | 3 | 3 | 0 | 1 | 2 | 1 |
| April | 2 | 2 | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 1 |
| May | 4 | 5 | 4 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 3 | 2 |
| June | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 7 | 10 | 9 | 11 | 15 | 15 | 14 | 11 | 11 | 10 | 10 | 7 | 5 |
| August | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| September | 0 | 2 | 4 | 4 | 4 | 2 | 0 | 2 | 3 | 2 | 3 | 6 | 4 |
| October | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 6 | 8 | 6 | 7 | 7 |
| November | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 3 |
| December | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 3 |
| Total | 28 | 29 | 30 | 30 | 30 | 30 | 30 | 31 | 31 | 31 | 31 | 31 | 31 |

Table 11 Factors determine the adjustment month within a year

| | Dependent variable = month of mw adjustment | | | | |
|------------------|---|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) |
| lgdppc | 0.0206 (0.355) | 0.00497 (0.457) | 0.301 (0.184) | 0.499** (0.227) | 0.379 (0.586) |
| emprate | -4.631 (3.199) | -4.075 (2.669) | -1.744 (1.199) | -2.483 (1.468) | -7.324 (5.017) |
| ir_gap | -3.051 (4.172) | -1.974 (4.654) | -0.657 (2.620) | -0.586 (2.611) | -0.417 (3.522) |
| tertiary | -0.853 (1.915) | -1.072 (2.092) | -0.257 (0.593) | -0.299 (0.595) | -3.226 (2.756) |
| priemp | -2.468 (2.102) | -3.692 (2.275) | 0.444 (0.905) | -0.225 (0.944) | -0.738 (1.415) |
| fdish | -0.0863 (6.246) | 2.540 (7.013) | -0.0477 (4.282) | 3.086 (5.396) | 3.198 (10.18) |
| fiscexp | 2.650 (3.650) | 3.746 (4.066) | 3.740*** (1.345) | 2.956** (1.374) | 8.755** (3.972) |
| servicesh | 44.69** (19.82) | 30.55* (16.42) | 11.97 (7.599) | 6.510 (8.289) | 12.85 (19.28) |
| firmn | 0.0213 (0.0639) | 0.00556 (0.0655) | -0.0177 (0.0219) | -0.0403 (0.0254) | -0.178 (0.114) |
| lcons_r | | 0.0438 (0.807) | | 0.445 (0.564) | 0.719 (1.049) |
| lcons_u | | -0.105 (1.617) | | -0.893 (0.939) | -4.388** (2.077) |
| year dummies | | yes | yes | yes | yes |
| province dummies | | no | no | yes | no |
| city dummies | | no | no | no | yes |
| N | | 2042 | 1866 | 2042 | 1866 |
| adj. R-sq | | 0.080 | 0.093 | 0.398 | 0.386 |

Table 12 Time adjusted and the level of minimum wages (coefficients on the month of adjustment)

| | (1) | (2) | (3) | (4) | (5) |
|---|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|
| Dependent var. = | | | | | |
| A: the highest level of mw within a city | 2.368 (1.664) | 2.811* (1.602) | 1.310 (1.163) | 1.957* (1.106) | 1.543 (1.203) |
| B: Ln (the highest level of mw within a city) | 0.00662* (0.00339) | 0.00761** (0.00323) | 0.00575** (0.00269) | 0.00734*** (0.00258) | 0.00621** (0.00291) |
| C: The highest level of mw within a city relative to average wage | 0.0000377 (0.0000878) | 0.0000794 (0.0000767) | 0.000190** (0.0000803) | 0.000218*** (0.0000791) | 0.000224** (0.0000890) |
| D: the lowest level of mw within a city | 0.145 (1.943) | 1.187 (1.751) | 1.106 (1.178) | 1.952* (0.999) | 1.712* (0.996) |
| E: Ln(the lowest level of mw within a city) | 0.00207 (0.00455) | 0.00431 (0.00428) | 0.00583** (0.00273) | 0.00767*** (0.00249) | 0.00688** (0.00279) |
| F: The lowest level of mw within a city relative to average wage | -0.0000740 (0.0000927) | -0.0000654 (0.0000705) | 0.000166** (0.0000712) | 0.000195*** (0.0000699) | 0.000205** (0.0000761) |

Note: The controls in columns 1-5 are the same as those corresponding columns in Table 11.