

**What Do Unions in a Workers' Paradise Do?
Provincial-Level Evidence on Wages, Employment, Productivity, and
Economic Output in China**

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Abstract: Utilizing provincial-level data from the period of 1994-2008, this paper studies the relationship between union density and wages, employment, productivity, and economic output in China. The findings indicate that union density does not affect average wage levels, but is positively associated with productivity and output outside of the agricultural sector. These results are consistent with the weak monopoly power of Chinese unions that are not independent and that lack the right to strike, but suggest that Chinese unions might have a strong collective voice face.

JEL code: J3, J5

Given the importance of labor unions in modern labor markets, many scholars have studied the effects of labor unions on wages, employment, and other important economic variables, such as labor productivity and economic growth. While the findings are extensive and insightful, little is known about these effects in China. This incomplete understanding of what unions do in China is a significant issue because China is fast becoming one of the world's largest economies and arguably has the world's largest labor movement.

Data availability may be one reason that the large union literature has overlooked China. Another is the view that unions in China are not independent organizations like Western labor unions. The communist government claims to represent workers' interests and calls China a workers' paradise. With workers' interests represented directly by the Communist Party of China (the Party), labor unions in China have traditionally been seen as a "transmission belt" for delivering the Party's voice and policies to workers.

While this view is helpful in reminding us that unions in China may be very different from their counterparts in other countries, it remains an empirical task to study unions' role in the economy. Such studies are particularly important in light of the fact that the economic reforms started in 1978 have dramatically changed the economic landscape of China. For example, in 1978 over 80 percent of China's industrial employment was in the state-owned enterprises, but by 2008 nearly 75 percent of industrial employment was in the non-state sector comprised of private and multinational corporations.¹ Along with the dramatic increase in non-state employment, union representation has also grown significantly in non-state enterprises. For instance, in 1981 only 16 percent of China's union members were in the non-state sector.² In

¹ These data are from China Statistics Yearbooks.

² The data are from the article "Reform and opening up: trade unions in China continue to forge ahead", 2008. The article is available on the website:

2008, 73 percent of China's union members were in the non-state sector; and 57 percent of non-state workers were union members.³

The purpose of this study is to analyze whether unions in China are associated with cross-provincial variation in economic outcomes. Specifically, we empirically test whether provincial union density is related to provincial-level measures of workers' wages, total employment, labor productivity, and aggregate economic output. The provincial-level data used span 15 years from 1994 through 2008. The study finds that unions have a positive and significant relationship with provincial GDP, output of the secondary and tertiary industries, and productivity, but no significant effect on average wage levels. These findings suggest that unions in China might be similar to unions in other countries in some respects, but not in other ways. Namely, our results are consistent with Chinese unions have a strong collective voice aspect, as do many other unions, but unlike Western unions, we do not uncover support for the hypothesis that Chinese unions are able to raise wages.

Ge (2007) and Lu, Tao, and Wang (2010) recently also studied union effects on employee benefits and labor productivity in China. These two studies both use firm-level survey data, whereas our study uses provincial-level aggregate data and thus provides a macro-perspective on the dynamics between Chinese labor unions and the economy. Notably, all three studies find that unions in China are positively associated with labor productivity. It is important and interesting to note this consistency in the findings of these studies despite very different data sets and methodologies used.

Literature Review

Economists and others have long been very interested in the effects of labor unions on

<http://acftu.people.com.cn/GB/67580/134642/135082/8600509.html>.

³ These data are from China Trade Union Yearbook (2009).

various aspects of economy, and there is a large literature on what unions do within many countries. Arguably the dominant theory that underlies much of this literature is Freeman and Medoff's (1984) two faces of unionism model. In the monopoly face, labor unions use their monopoly power, derived from the threat of imposing costs on the organization through strikes and other means, to increase wages and benefits above what the nonunion labor market would provide. This could (suboptimally) increase productivity if higher wages provide additional motivation or attract higher-quality workers, or could reduce productivity if unions use their monopoly power to extract more favorable working conditions. In the collective voice face, unions convey workers' preferences to managers who are then better able to develop employment conditions that employees prefer, including the additional provision of workplace public goods, without distorting competitive labor market outcomes. Productivity can improve via improved employee satisfaction and also via a direct channel of employee voice that identifies process improvements and resolves problems. The two-faces theory therefore predicts that unions will have significant effects on workers' wages, employment, and productivity, though the welfare evaluation of these effects are different in the two faces.

In the United States, empirical evidence clearly documents significant wage gaps between union and non-union workers (Lewis 1963; Freeman 1980 1984; Freeman and Medoff 1984; Blanchflower and Bryson 2004; Bennett and Kaufman 2004). The same results have been found for the United Kingdom, Australia, Canada, and Japan as well (Blanchflower and Bryson 2010; Cai and Waddoups 2011; Fang and Verma 2002; Morikawa 2010).

Lewis (1963) is one of the first studies to show that unions have a significant negative effect on employment. Since his study, many subsequent studies have also found that union hinders employment and the growth of employment in different countries. For instance, Dickens

and Leonard (1985) showed that in the United States, the growth of employment in unionized companies was slower than that in non-unionized companies. Similar results have been found for the United Kingdom (Blanchflower et al. 1991; Fernie and Metcalf 1995; Booth and McCulloch 1999; Addison and Belfield 2004), Australia (Blanchflower and Burgess 1996; Wooden and Hawke 2000), and Canada (Wallsworth 2010).

Evidence for the union effect on productivity is mixed. Brown and Medoff (1978) found that unionization was associated with higher productivity levels in the United States, but subsequent studies in Western countries found that the results vary by year, country, and labor relations environment (Addison and Hirsch 1989; Belman 1992; Hirsh 1997; Doucouliagos and Laroche 2003; Metcalf 2003; Hirsh 2004). In a study of Japanese firms, Morikawa (2010) found that unions are positively related to firm productivity. This is of particular interest for this study because Japanese unions are enterprise unions and are generally less adversarial than U.S., British, Australian, and Canadian unions.

Theoretically, unions should also affect aggregate economic output if they impact the performance of individual companies. But there is less evidence on the effect of unions on economic growth than on wages, employment, and firm or industry productivity. Pantuosco, Parker, and Stone (2001) examined how unions affect various economic barometers, including unemployment rates and the growth rates of gross product and productivity. They used panel data of 48 U.S. states from 1978 to 1994, and found that unions adversely affected the growth rates of gross state product and productivity. More generally, research has shown that labor market institutions and regulations including unions have a significant effect on aggregate economic performance (Besley and Burgess 2004, Nickell and Layard 1999, Freeman and Nickell 1988).

In China, empirical research on union effects is relatively rare. Using the enterprise data

from the First National Economic Census in 2004, Ge (2007) found that unions had a positive effect on the average wage and benefit levels of workers, and on the productivity, research and development and human capital investment of firms. The Census was conducted by the National Bureau of Statistics of China (NBSC) and provided cross-section data of Chinese enterprises. The enterprise sample that Ge used was collected from mining, manufacturing, electrical power, gas and water supply industries.

Another study by Lu, Tao and Wang (2010) also used corporate data collected by the Private Enterprise Survey in China to study union effects on the performance and employment relations in private enterprises. The Private Enterprise Survey was conducted in 2006, jointly by the United Front Work Department of the Central Committee of the Communist Party of China, the All China Industry and Commerce Federation, and the China Society of Private Economy at the Chinese Academy of Social Sciences. Using a sample covering nearly 3,239 private enterprises, Lu, Tao and Wang found that unions significantly increased labor productivity, but had an insignificant effect on profitability and wages.

Our study differs from the aforementioned two studies in that our study uses provincial panel data to test union effects while the previous two studies used firm-level data. In terms of the level of the analysis, our paper therefore most closely resembles Pantuosco, Parker, and Stone's (2001) analysis of U.S. states and Besley and Burgess's (2004) analysis of Indian states.

Institutional Background

History and Status of Unions in China

Before 1978, China had a centrally planned economy. Unions existed in all of the state-owned enterprises, wages were set by the government, and workers were guaranteed lifetime employment. According to official ideology, there were no conflict of interests between

an employer and employees. Unions therefore served as a workers' club and were not engaged in collective bargaining. Unions were led by the Communist Party and the leaders of unions were appointed by the Party rather than elected by union members (Ng and Warner, 1998). There was a union law enacted in 1950, but it was very different from the union laws in market-economy countries.

After 1978, China moved toward "a socialist market economy." Two sectors have emerged: state and non-state owned sectors in the economy. The market-based employment relationship in the non-state sector has the potential for conflicting interests between employers and employees, and is governed by market forces and labor laws. Therefore, after the reforms, unions in China are acquiring new roles. In the non-state sector, it is expected that unions will take up the role that their counterparts play in the Western market-economy countries, representing workers in contract bargaining and administration, while in the state-sector, it is expected that unions will continue in their traditional roles. The transition to these new roles in the non-state sector, however, has been uneven, and empirical analyses are needed to test whether unions have transformed to fit their new roles.

Along with these changing roles, unions have also been expanding their membership since 1978. In 1994, there were 581,000 grass-root union organizations and 114 million union members in China nationwide.⁴ In 2010, there were nearly 2 million grass-root unions in 3.7 million companies and organizations across the country and a total of 240 million union members.⁵ In fact, China's sole union federation, the All-China Federation of Trade Unions

⁴ These data are from China Trade Union Yearbooks.

⁵ These data are from "Statistical Communiqué of the People's Republic of China on 2008 Developments of Union Organizations and Union Work."

(ACFTU), now proclaims itself as the largest union organization in the world.⁶ Therefore, it is important to analyze the effects of unions on the Chinese economy.

Chinese Union Law

The first Union Law of the People's Republic of China was enacted in 1950 and specifies the rights and obligations of unions. As China's political, economic and social situation has undergone profound changes since 1978, unions are required to play new roles and the second Chinese Union Law was enacted on April 3, 1992 and the last amended on October 27, 2001.

According to the Union Law, Chinese unions have the right to organize workers (Chapter 1, Article 2), the right to represent employees in negotiation and collective bargaining with the employer (Chapter 1, Article 6), and the right to assist and provide guidance to employees in signing labor contracts with an enterprise (Chapter 3, Article 20). If an enterprise violates the labor law or collective contract and infringes upon the rights and interests of the employees, unions can file a dispute against the enterprise or submit an arbitration and mediation request (Chapter 3, Article 20). But there is no provision in the Union Law that specifies the right to strike for unions or workers in China. Chinese unions are formally democratic in that union representatives at all levels must be elected by members (Chapter 2, Article 9).

At a local-level, Chinese unions are enterprise unions. Employees in the same enterprise have the option to voluntarily join one designated union for that enterprise. Under the Union Law, all of these unions are affiliated with the ACFTU. Under the ACFTU's umbrella, there are 31 provincial, regional and municipal federations and 10 national industrial unions. The highest decision-making bodies for Chinese unions are the National Congress and the ACFTU Executive Committee. The National Congress meets every five years.

⁶ It was announced in the press conference of the 15th National Congress of Chinese Trade Unions, October 17, 2008.

There are two major funding sources for unions in China: membership dues and mandatory employer payments. For the latter, employers must make monthly payments to its union amounting to two percent of its total wage bill. Smaller levels of funding are obtained through subsidies from the government.

Implications

To highlight the implications of the institutional context of Chinese unions for our study, it is useful to briefly note a few significant differences between unions in China and those in Western countries. First, while unions have various organizational structures in Western countries, the Chinese labor movement is legally mandated to have a single hierarchical structure. All unions are affiliated with the ACFTU and there is no competition between unions. Second, Chinese unions are not as independent as their Western counterparts. Chinese unions are led by the Chinese Communist Party, and partly funded by the company and the government. Third, the Chinese Union Law does not provide for a right to strike or protect workers from discrimination or retaliation by their employer if they go on strike.

These institutional differences lead to three implications for the union effects on wages, employment, labor productivity and economic growth in China. First, Chinese unions may not significantly increase wages because they are not independent from the enterprises and governments and because they lack the right to strike. Second, Chinese unions may help increase labor productivity. While lacking strong power for collective bargaining, weaker forms of unions' collective voice are firmly cemented in the enterprise. These voice mechanisms might increase productivity. Third, if Chinese unions do not raise wages but increase productivity, then they may be associated with higher levels of employment and economic growth.

Data and Variables

The data used in this study are primarily compiled from *China Statistics Yearbooks*, *China Labor Statistical Yearbooks* and *Provincial Statistics Yearbooks*, and *China Trade Union Yearbooks* from 1994 to 2008. The first three of these yearbooks are published annually by the National Statistical Bureau of China and report economic statistics based upon official surveys and data collection efforts. The China Trade Union Yearbook is published by the ACFTU. We chose to start with 1994 because provincial unionization statistics have been reported only since 1994. Thus, our data consist of a 15-year panel of the 29 provinces of China during this period, excepting Tibet because complete data are not available. Technically, three of these provinces are municipal cities directly under the central government (Beijing, Tianjin, and Shanghai), but for convenience we will refer to them as “provinces” in the text.⁷ Table 1 provides the definition and summary statistics of the variables used in the study.

We start with the information from the *China Trade Union Yearbooks* on the number of “employees in the unionized workplace” and the number of “union members in the unionized workplace” reported annually by province. The former measures union coverage while the latter measures union membership. We then use annual data on the total number of employees by province reported in *China Labor Statistical Yearbooks* to construct each province’s annual union coverage and membership density. Specifically, the union coverage (membership) density is the fraction of employees (union members) in unionized workplaces relative to all the employees in a province.

Between 1994 and 2008 the provincial coverage density ranges from 0.078 to 0.844, with

⁷ In 1997 Chongqing became the fourth municipal city directly under the central government, but because separate data for Chongqing are not available prior to this time, we continue to treat Chongqing and Sichuan as one province by combining the reported figures.

an overall mean of 0.253. In each province, nearly 90 percent of employees in the unionized workplaces are union members, and the average membership density is 0.237 with a range from 0.072 to 0.782. In micro-level analyses, the distinction between union coverage and union membership can be significant (Andrews et al. 1998; Budd and Na 2000), but in our provincial-level data, the correlation between these two measures of union density is 0.99. Since the regression results are the same using either measure, we will present and discuss the results using the union coverage density measure. This is the primary independent variable of interest.

For dependent variables, we need measures of wages, employment, productivity, and aggregate economic output. We obtain data on the provincial average wage and the number of employees in each province from *China Labor Statistical Yearbooks*, and convert each to logarithms for analysis. Annual data on provincial gross domestic product (GDP) and population are obtained from *China Statistics Yearbooks*, and GDP is then converted to a per capita measure using the population series, and then converted to a logarithmic scale. From *China Statistics Yearbooks* we are also able to obtain provincial industry output for three broad sectors: primary industry refers to agriculture, forestry, animal husbandry and fishery and services in support of these industries; secondary industry includes mining and quarrying, manufacturing, production and supply of electricity, water and gas, and construction; tertiary industry refers to all other economic activities not included in the primary or secondary industries, mainly service. We then create a logarithmic per capita output measure for each sector. As a measure of productivity, we use data on “output value added in the secondary industry” drawn from the MacroChina database. This measure is only available for the secondary industry, and we convert it to a logarithmic per employee scale.

We also use these same sources to construct additional control variables. The percentage

of workers employed in the private sector is obtained by using series on the number of persons employed in the private sector and total employment from *China Labor Statistical Yearbooks*. Fixed assets investment and government expenditure are obtained from *China Statistics Yearbooks* and converted to logarithmic per capita scales. The provincial population series from *China Statistics Yearbooks* is also converted to a logarithmic scale and used as another control variable. Finally, we use year and province fixed effects to control for time-specific and province-specific factors, including differences in the real price level over time and across provinces.

Union Density Trends

The solid line in Figure 1 shows that in the aggregate, union density in China generally increased between 1994 and 2008 from around 19 percent to 31 percent. But from 1994 to 1999, union density in many provinces decreased. The main cause for the decline in union density during this period was the state-owned enterprise reform and restructuring. State-owned enterprises have a stronger union presence than private companies. Since 1992, as the reform of state-owned enterprises deepened, the number of employees in state-owned companies decreased, so did union members. Since 1998, to reverse the declining trend of union membership, the ACFTU has taken great effort to expand unions in private companies.⁸ After the China's national trade unions congress was convened in 2003, unions in China have expanded rapidly. Figure 1 confirms the increasing union density from 1999 to 2002 and from 2003 to 2005 in many provinces.

Despite the overall increase in union density in China, there exists a large variation

⁸ This is from the article "*Reform and opening up: trade unions in China continue to forge ahead*", 2008. The article is available on the website: <http://acftu.people.com.cn/GB/67580/134642/135082/8600509.html>.

across the country. The three areas, which have the highest union densities, are Beijing, Tianjin and Shanghai. Liaoning, Jilin and Heilongjiang also had a relatively high union density; while Sichuan, Guizhou and Yunnan had the lowest union density among all provinces. For instance, in 2005, Shanghai had the highest union density (68.1 percent), while Yunnan had the lowest (10.3 percent). This is important because the analyses in this paper rely on variation in union density.

But even more important is variation within these provinces between 1994-2008., Figure 1 therefore also shows the provincial union density for four of the 29 provinces. Guangdong is a southern province that is home to much of China's contract manufacturing operations, and therefore has the highest GDP per capita of the provinces. It is also the largest province in terms of population. Xinjiang is a province in the far western region of China. It is the largest in terms of area, but is one of the smallest in terms of population. Liaoning is an average-sized northeastern province with above average levels of GDP, and Yunnan is an average-sized southwestern province with one of the lowest levels of GDP.

These provinces were selected for inclusion in Figure 1 to reveal the differences in provincial union density trends. Three key results emerge. First, note the significant variation in provincial union density across these selected provinces. Union density in Liaoning and Xinjiang is consistently above the national average whereas Yunnan is always below average. Moreover, density in Liaoning is consistently 4-5 times greater than in Yunnan. Second, the trends in union density are not uniform across provinces. Union density in Liaoning is variable over time, union density in Guangdong has a positive trend, and union density in Xinjiang has a negative trend for much of the time period covered.

Third, there is significant within-province variation in at least some of the provinces. In Liaoning, union density begins at a level higher than 50 percent in 1994, declines to less than 36

percent in 1999, increases to 48 percent in 2002, and then dips slightly before trending upwards to 56 percent. In Guandong, union density decreases between 1994 and 1997, and then trends upwards for much of the rest of the time period, but not uniformly. It is this type of variation that we will exploit in multivariate analyses of the relationship between provincial union density and wages, employment, productivity, and economic output.

Method and Results

Regression Model

We estimate the following panel data regression:⁹

$$y_{it} = \alpha_i + \beta_t + \gamma Union_{it-1} + \delta x_{it} + \varepsilon_{it}$$

In the model, y_{it} is the dependent variable, including the logarithm of GDP per capita, the logarithm of primary, secondary, and tertiary industry output per capita, the logarithm of average wage, the logarithm of employment, and the logarithm of value added per employees in the secondary industry in province i in year t . $Union_{it-1}$ is the one year-lagged union density, measured by the percentage of the employees in the unionized workplaces of all the employees in province i in year $t-1$. Using a two-year lagged value instead of one-year lag for union density in the estimation does not change the results.

x_{it} are control variables in province i in year t , including the logarithm of provincial population, the logarithm of fixed assets investment per capita, the logarithm of government expenditure per capita and the percentage of workers employed in the private sector in a province. α_i is the province fixed effect, which captures other unexplained province-specific factors. β_t is the year fixed effect, which captures year-specific effects.

⁹ We use a fixed effects rather than first difference model of panel data to estimate because there is not a strong correlation across years and the number of years (15) is less than the number of provinces (29).

Regression Results

We use the empirical model introduced in sub-section 5.1 to estimate the association between union density and wages, employment, productivity, and economic output. Column 1 of Table 2 reports the results for this regression specification using the (log) average provincial wage as the dependent variable. There is not sufficient evidence to conclude that union density has a significant correlation with average wage levels. While this result differs from estimates of the wage effects of Western unions, it is consistent with the weak bargaining power of Chinese unions and with the empirical results of Lu, Tao and Wang's (2010) analysis of firm-level Chinese data.

The results reported in the column 2 of Table 3 reveals a significantly negative relationship between union coverage and provincial employment. This might reflect some mechanism in which unions dampen employment growth, either through their own activities or because entrepreneurs and investors direct their job creation efforts toward provinces where unions are less frequent or toward a more capital-intensive technology where unions are more frequent. For example, Western foreign direct investment might seek to avoid unions based on conceptions of Western unions with significant bargaining power. Alternatively, one might be tempted to speculate that this result reflects a situation of reverse causality in which unions are more successful in smaller provinces. But note that the regression controls for population size, so the result more precisely indicates that holding population size constant, provinces with higher union densities have lower employment levels. This would be consistent with a scenario in which unions are more successful when a smaller fraction of the population is engaged in formal employment. A third alternative is measurement error because the union density independent variable is constructed with provincial employment in the denominator. This would require

persistent measurement error across years because the regression models include lagged rather than contemporaneous union density. We will return to these issues below when we discuss the instrumental variable results.

Column 3 of Table 2 reports the regression results for the measure of productivity we were able to construct—specifically, log value added per employee in the secondary sector. Recall that the secondary sector includes mining and quarrying, manufacturing, production and supply of electricity, water and gas, and construction. The estimated coefficient for the union density variable is positive and precisely estimated suggesting that Chinese unions are positively associated with productivity levels. Again, this is consistent with a situation in which Chinese unions have weak monopoly power, but a stronger collective voice role. It is also consistent with a reverse causality situation in which Chinese unions are more successful in high-productivity provinces. This suggests a need for an instrumental variables approach which will be pursued later in this paper.

Table 3 reports the estimates for the economic output regressions. The first column shows the results for (log) GDP per capita as the dependent variable, and the remaining three columns report the results for primary, secondary and tertiary industry output as the dependent variable. In column 1, union density has a significant and positive association with overall economic output (GDP per capita). The estimate in column 1 implies that a one percentage point increase in union density is associated with 0.426 percent higher GDP per capita. A similar positive association is found in columns 3 and 4 for industry output in the secondary and tertiary sectors.

By themselves, these results might imply that unions have a positive effect on aggregate economic activity in Chinese provinces. Such a result would be consistent with the weak monopoly power of Chinese unions not curtailing economic activity (recall the lack of a

significant wage effect in Table 2), and with a collective voice face promoting economic activity (recall the positive productivity estimate in Table 2). However, it might also reflect a reverse causality situation in which unions are more successful in provinces with higher levels of economic activity. Indeed, note that there is a negative relationship between union density and economic output in the primary sector. Recall that the primary industry includes agriculture, forestry, animal husbandry, and fishery services. If unions effected economic output, we would expect an insignificant relationship between density and output in this sector because there is little union presence in this primary sector. A significant negative estimate is more suggestive of a reverse causality relationship in which unions are not less frequently found in provinces with higher levels of primary sector activity. This further suggests a need for an instrumental variables estimation strategy.

Instrumental Variable Results

As noted in our discussion of the results from Tables 2 and 3, it is difficult to make causal inferences from the OLS regressions. In other words, unionization might be endogenous such that the dependent variables are causing shifts in union density rather than vice versa. To explore this further, we pursued an instrumental variables estimation strategy. This requires finding instruments that are correlated with provincial unionization variation, but not the dependent variables.

For this, we tried three routes. First, if there are shared attitudinal characteristics towards labor unions within a certain geographical area, then a province's unionization rate might be correlated with the density rates in neighboring provinces, but not a direct predictor of economic outcomes in that province. Second, provincial laws pertaining to union organizing might be correlated with union density, but not economic outcomes. Such laws include whether requiring

organizations to set up unions within 12 months of the organization starting up, to set up a union committee when there are more than 25 union members in the organization, or to have full-time union officials when there are at least 250 workers. Third, whether a provincial union president is in the provincial standing committee of the Party could indicate attitudes toward unions, and thus be correlated with union density, without affecting economic outcomes.

Tables 4 and 5 present the results using the average union density rate in neighboring provinces and an indicator for whether the province has a policy requiring organizations to set up unions within 12 months as instruments for union density. The pattern of results for other instruments is generally similar to those presented in Tables 4 and 5. Note that these tables only report the coefficient and standard error for the main independent variable of interest (union density), but each regression model includes the same control variables as in Tables 2 and 3. Tables 4 and 5 also report the p-values of a Hausman endogeneity test and an overidentification test. A small p-value for the endogeneity test is consistent with union density being endogenous, and thus the need for an instrumental variables approach. A large p-value for the overidentification test supports the validity of the instruments.

As shown in column 1 of Table 4, the large p-value for the endogeneity test for the wage model indicates that there is not enough evidence to conclude that unionization is endogenous with respect to wages. And even setting this aside, the insignificant coefficient repeats the insignificant result from the OLS estimation in Table 2. This is consistently the case when we try other instruments in the wage model. With respect to employment levels (column 2), the OLS results suggested a significant negative relationship with union density. The results in Table 4 cast doubt on this negative relationship, but we should emphasize that the results for the employment model are very sensitive to the instruments used. So endogeneity is seemingly more

of a concern for the relationship between employment and union density, but a lack of robust results leaves us unable to draw stronger conclusions. With respect to productivity, the results in column 3 of Table 4 indicate that endogeneity is not a concern. Moreover, the estimate is similar in magnitude to the OLS coefficient, albeit with a much larger standard error which can be common when using instruments.

Turning to the economic output results in Table 5, the results for per capita GDP indicate that endogeneity is a concern and that we have valid instruments. The estimated union density coefficient is positive and statistically significant, as in the OLS case. Other instruments also yield a positive, statistically significant estimate for union density. The results for economic output in the three broad sectors are presented in columns 2-4. The secondary and tertiary sector results broadly support the OLS results. For the secondary sector, there is not evidence to support endogeneity, and while the coefficient is noisily estimated, the coefficient is similar to the OLS estimate. For the tertiary sector, the union density estimate is positive and statistically significant. In the primary sector, the estimated relationship between unionization and output is negative, as in the OLS case, though the overidentification test suggests that we have failed to find valid instruments.

Summary and Conclusion

This paper analyzes the important question of the relationship between unionization and important economic outcomes—average wage levels, employment, productivity, and economic output—using panel data from 29 Chinese provinces between 1994 and 2008. Using both OLS and instrumental variable regression models, we do not find a significant union effect on wages. This is consistent with the institutional reality of Chinese labor unions—unlike Western unions, Chinese unions are not independent unions with the right to strike, and thus they lack power to

negotiate wage contracts different from what the market or managers impose in other Chinese enterprises.

With respect to productivity and output, our results indicate a positive relationship between productivity or aggregate economic output and union density. Specifically, provinces with higher levels of union density, on average, are also provinces with higher levels of productivity and aggregate economic output, except in the agricultural sector. While finding good instruments is commonly difficult, the instrumental variable results generally stay the same, or the union coefficient gets larger. So these results seem to reinforce a positive relationship. The employment results, however, are more sensitive to the regression specification, and endogeneity seems to be a significant concern.

So in conclusion, by analyzing 15 years of provincial-level data, we have obtained the following results: a) Chinese unions do not appear to be associated with higher wages, b) unions do appear to be associated with higher GDP and productivity, and c) the relationship between unions and provincial employment is complex and needs further study. The results are consistent with a weak monopoly face and strong collective voice face of Chinese labor unions, though the results are not able to indicate who actually benefits from this collective voice.

Our findings suggest that, although controlled by the Party, unions in China are not simple and largely irrelevant extensions of the Party as some have believed. At the same time, our findings suggest that unions in China are indeed very different from those in capitalist market economies in terms of their impacts on an economy and the employment relationship.

Given the lack of empirical analysis of Chinese unions, we believe these results using provincial-level data are important, but future research efforts should use microdata and case studies to better uncover the specific mechanisms that underlie the relationship between unions

and wages, employment, and productivity in China. This could include comparative research that analyzes different types of organizations including state-owned enterprises, private enterprises, and foreign-owned enterprises in China. Future research should also explore the union effects on workers' non-wage benefits in China. There is still much to be learned about the roles of labor unions in determining individual and macroeconomic outcomes in China.

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Table 1: Variable Definition and Summary Statistics

Variable	Definition	Mean (Std Dev)	Min./ Max.
Union coverage density	The percentage of the employees in the unionized workplaces of all the employees in a province, 1994-2008	0.253 (0.140)	0.078 0.844
Union membership density	The percentage of union members in the unionized workplaces of all the employees in a province, 1994-2008	0.237 (0.136)	0.072 0.782
Log GDP per capita	The logarithm of GDP per capita in a province, 1994-2008	9.078 (0.737)	7.318 11.192
Log primary industry output per capita	The logarithm of the per capita output of agriculture, forestry, animal husbandry, and fishery industries in a province, 1994-2008	7.130 (0.479)	5.881 8.542
Log secondary industry output per capita	The logarithm of the per capita output of mining and quarrying, manufacturing, production and supply of electricity, water and gas, and construction industries in province, 1994-2008	8.281 (0.816)	6.339 10.405
Log tertiary industry output per capita	The logarithm of the per capita output of industries other than the primary or secondary industries, 1994-2008	8.071 (0.833)	6.017 10.722
Log wage	The logarithm of the average wage of workers in a province, 1994-2008	9.277 (0.605)	8.124 10.943
Log employment	The logarithm of the number of employees in a province (in 10,000s), 1994-2008	7.408 (0.869)	5.407 8.812
Log value added per employee	The logarithm of value added per employee in the secondary industry in a province, 1994-2008	8.945 (0.845)	6.973 11.238
Log population	The logarithm of the number of population in a province, 1994-2008	8.107 (0.813)	6.161 9.380

Table 1 (continued)

Log fixed assets investment per capita	The logarithm of fixed assets investment per capita in a province, 1994-2008	8.163 (0.921)	5.801 10.269
Log government expenditure per capita	The logarithm of government expenditure per capita in a province, 1994-2008	7.028 (0.873)	5.054 9.528
Private sector employment share	The percentage of workers employed in the private sector in a province, 1994-2008	0.063 (0.080)	0.003 0.572

Source: See text.

Table 2: Unionization, wages, employment, and productivity in China, 1994-2008

	Dependent Variable		
	Log wage (1)	Log employment (2)	Log value added per employee (secondary industry) (3)
Union coverage density (lagged one year)	0.068 (0.075)	-0.259** (0.061)	0.727** (0.128)
Log population	-0.063 (0.108)	0.838*** (0.087)	0.272 (0.184)
Log fixed assets investment per capita	0.030 (0.016)	-0.010 (0.013)	0.177** (0.027)
Log government expenditure per capita	0.321** (0.032)	0.043 (0.026)	0.374** (0.055)
Private sector employment share	0.477** (0.083)	0.100 (0.068)	-0.580** (0.143)
Province fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Adjusted R ²	0.97	0.95	0.97
Observations	406	406	406

Source: See text.

Notes: Each entry contains the coefficient and standard error in parentheses from an ordinary least squares regression model.

* Statistically significant at the 0.05 level, ** at the 0.01 level (two-tailed tests).

Table 3: Unionization and Output in China, 1994-2008

	Dependent Variable			
	Log GDP per capita (1)	Log primary industry output per capita (2)	Log secondary industry output per capita (3)	Log tertiary industry output per capita (4)
Union coverage density (lagged one year)	0.426** (0.086)	-0.338** (0.110)	0.400** (0.122)	0.461** (0.113)
Log population	0.434** (0.123)	-1.454** (0.159)	0.829** (0.176)	0.065 (0.163)
Log fixed assets investment per capita	0.114** (0.018)	0.061** (0.023)	0.189** (0.026)	0.053* (0.024)
Log government expenditure per capita	0.311** (0.037)	-0.110* (0.047)	0.421** (0.052)	0.300** (0.048)
Private sector employment share	0.134 (0.095)	-0.624** (0.123)	-0.492** (0.136)	0.207 (0.126)
Province fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	0.97	0.95	0.97	0.97
Observations	406	406	406	406

Source: See text.

Notes: Each entry contains the coefficient and standard error in parentheses from an ordinary least squares regression model.

* Statistically significant at the 0.05 level, ** at the 0.01 level (two-tailed tests).

Table 4: Unionization, wages, employment, and productivity in China—Instrumental variables results

	Dependent Variable		
	Log wage (1)	Log employment (2)	Log value added per employee (secondary industry) (3)
Union coverage density (lagged one year)	-0.038 (0.333)	0.223 (0.320)	0.672 (0.578)
Controls from Table 2	Yes	Yes	Yes
Endogeneity test p-value	0.777	0.117	0.929
Overidentification test p-value	0.768	0.059	0.305
Adjusted R ²	0.99	0.99	0.98
Observations	406	406	406

Source: See text.

Notes: The first row contains the coefficient and standard error in parentheses from instrumental variables regressions in which (a) the average union density rate in neighboring provinces and (b) an indicator for whether the province has a policy requiring organizations to set up unions within 12 months are used as instruments for union density.

* Statistically significant at the 0.05 level, ** at the 0.01 level (two-tailed tests).

Table 5: Unionization and Output in China—Instrumental variables results

	Dependent Variable			
	Log GDP per capita (1)	Log primary industry output per capita (2)	Log secondary industry output per capita (3)	Log tertiary industry output per capita (4)
Union coverage density (lagged one year)	1.256** (0.406)	-1.331* (0.545)	0.358 (0.528)	1.535** (0.590)
Controls from Table 2	Yes	Yes	Yes	Yes
Endogeneity test p-value	0.024	0.063	0.938	0.055
Overidentification test p-value	0.884	0.007	0.402	0.304
Adjusted R ²	0.99	0.96	0.98	0.98
Observations	406	406	406	406

Source: See text.

Notes: The first row contains the coefficient and standard error in parentheses from instrumental variables regressions in which (a) the average union density rate in neighboring provinces and (b) an indicator for whether the province has a policy requiring organizations to set up unions within 12 months are used as instruments for union density.

* Statistically significant at the 0.05 level, ** at the 0.01 level (two-tailed tests).

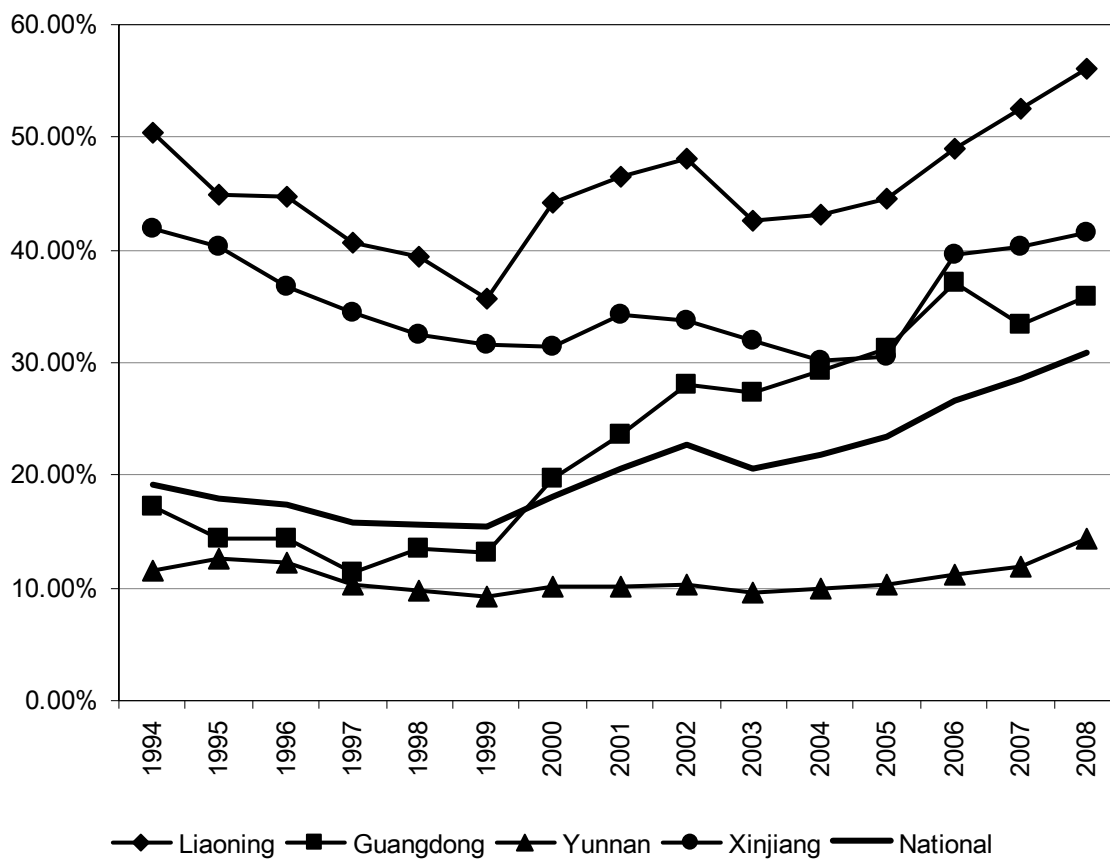


Figure 1: Chinese Union Density, 1994-2008: Aggregate and Selected Provinces