



CHICAGO JOURNALS



The Society of Labor Economists

NORC at the University of Chicago
The University of Chicago

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Source: *Journal of Labor Economics*, Vol. 31, No. 3 (July 2013), pp. 633-667

Published by: [The University of Chicago Press](#) on behalf of the [Society of Labor Economists](#) and the [NORC at the University of Chicago](#)

Stable URL: <http://www.jstor.org/stable/10.1086/669819>

Accessed: 01/07/2013 08:46

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Unions and Workers' Welfare in Chinese Firms

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Based on a survey of 1,268 firms in 12 cities, this article empirically studies unions' effects on worker welfare in China. Regressions carried out on a rich set of specifications show that unionization is significantly associated with higher hourly wages and larger pension coverage and weakly associated with lower monthly working hours. Further econometric analysis finds that unions promote individual and collective contracts. The effect of collective contracts vanishes when unions are present, whereas individual contracts have independent and positive effects. In addition, unions have effects on workers' welfare independent of collective and individual contracts.

I. Introduction

Labor unions in China have made major progress in recent years. By the end of 2009, there were 1.845 million grassroots labor unions, which was more than double that of 2003. Union membership reached 226 million, or 53% of urban workers, with an increase of 93 million in the previous

We wish to thank Richard Freeman, Alex Bryson, and seminar participants at the Hong Kong University of Science and Technology and at Peking University and the workshop participants at Coase Institute for their constructive suggestions and comments. We appreciate the International Finance Corporation for its financing and the National Bureau of Statistics of the People's Republic of China for organizing the survey. Ninghua Zhong thanks the Ontario Research Fund for financial support for the study. Contact the corresponding author, Ninghua Zhong, at ninghua.zhong@gmail.com.

[*Journal of Labor Economics*, 2013, vol. 31, no. 3]
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0734-306X/2013/3103-0005\$10.00

5 years.¹ Despite this growth, doubts are conventionally cast on the prospect that unions really improve workers' welfare in China. At the firm level, people from management often head unions; at the national level, the All-China Federation of Trade Unions (ACFTU) is a semigovernmental organization under tight control of the government. Hence, it is commonly held that Chinese unions may not represent workers' interests at either the local or the national level.

However, dramatic changes have happened in China's labor market in the past 2 decades, which have challenged and, in the meantime, offered opportunities to the ACFTU. The enterprise reform has privatized most state-owned enterprises (SOEs); the private economy now contributes two-thirds of China's industrial value-added. Concurrently, a large number of migrant workers—140 million in 2010 by official statistics—have entered urban employment, changing the outlook of the Chinese worker. Those changes have led to the informalization of the workplace, which refers to the phenomenon of substituting informal employment for formal employment. Even in the remaining SOEs, the "iron bowl," or lifetime employment, has been replaced by more flexible employment contracts.

Against this background, several forces are calling for better labor protection. The first force is growing domestic and international media coverage of exploitative working conditions, especially in the export sector.² The second force is a slowdown of the labor supply. The growth of the labor supply was estimated to peak in 2010 and then to decelerate in the coming years (Cai 2008). Wages of migrant workers increased by 20% in 2009 (Knight, Deng, and Li 2010), and they have continued to increase in more recent years. A tighter labor supply would give workers more bargaining power. The third force is the government. The government, partly out of its concern for social instability and partly from a strategy to preempt the development of an independent labor movement, has started to promote the ACFTU's efforts to harmonize labor relations in the workplace. To the extent that the ACFTU serves as a handler of the government, ACFTU-backed labor unions also enhance government control of enterprises.

These changes open up a possibility for unions to play a positive role in improving workers' welfare. With cross-sectional firm-level data from a 2006 survey of 1,268 enterprises in 12 cities, this article provides an econometric study on whether unionization is associated with better worker

¹ If not otherwise specified, data in this section come from the National Bureau of Statistics (NBS). See <http://www.stats.gov.cn> for full information.

² See, e.g., David Barboza, "U.S. Group Accuses Chinese Toy Factories of Labor Abuses," *New York Times*, August 2, 2007; and Howard W. French, "Fast-Growing China Says Little of China Slavery's Role," *New York Times*, June 21, 2007.

welfare in China, and if so, by what mechanisms. We acknowledge that Chinese unions are not independently established by workers and that they operate in a constrained institutional environment, so it is difficult to establish a clear causal relationship between unionization and workers' welfare. Instead, we work with a rich set of econometric specifications to explore different aspects of the relationship between unionization and workers' welfare.

Our main concern is unions' effects on three firm-level indicators of worker welfare: hourly wage, monthly working hours, and pension coverage.³ We obtain our baseline results for unions' effects by estimating a seemingly unrelated regressions (SUR) model, controlling for a set of baseline control variables that are strongly correlated with both unionization and worker welfare. Then we run several additional specifications to take care of the potential problems that our baseline estimation does not consider.

The first problem is related to the cross-sectional nature of our data. One issue is that our baseline results may be driven by the existence of some groups of firms that are better unionized and that treat workers better. Existing studies (e.g., Ge 2007; and Lee 2009) find that labor relations at the enterprise level show a great degree of diversity related to their localities and types of ownership. To deal with this issue, we estimate the SUR model for three subsamples: domestic private enterprises (DPEs), manufacturing firms, and firms in Guangdong Province. Firms in all three subsamples are more homogenous than in the whole sample. In addition, they have other distinctive features. The DPEs are less likely to establish unions, and their labor protection is weaker than that of either SOEs or foreign-invested enterprises (FIEs; Ge 2007; Shen and Yao 2009). Manufacturing is more competitive in the product market than other sectors, and competition may force firms to cut workers' benefits. Finally, Guangdong accounts for one-third of China's exports, and it has the largest presence of migrant workers. As a result, informalization may be more severe there than in other parts of the country. Furthermore, two notable labor events happened in Guangdong in 2010. One was the Honda plant strike (Cunningham and Wasserstrom 2011), and the other was a series of suicides at Foxconn, one of the world's largest original equip-

³ Although wages and working hours are the most frequently studied welfare indicators in the literature of unionization, fringe benefits are also included in some studies. In particular, Freeman (1981) and Freeman and Medoff (1984) argue that, in unionized firms, unions would take into account older workers' preferences and improve their fringe benefits through collective bargaining. These empirical studies (and some subsequent studies, e.g., Lewis [1990] and Buchmueller, Dinardo, and Valletta [2002]) find significant and large effects of unions on workers' fringe benefits.

ment manufacturers of electronics. All these issues make it worthwhile to take a look at the union effects in Guangdong.

The second problem we want to deal with is the consistency of the union effects. It would be natural to expect that unions help improve other aspects of workers' welfare if they improve the three major welfare indicators. To test this problem, we run separate regressions for five sets of additional indicators that cover various kinds of insurance, training and accidents, severance benefits, amenities, and job tenure.

The third problem is the endogeneity of unionization. Most recent studies have tried to deal with this issue (e.g., Booth and Chaterji 1995; Lanot and Walker 1998; Budd and Na 2000; DiNardo and Lee 2004; Gittleman and Pierce 2007; and Lee and Mas 2012). In this article, unionization can be endogenous for two reasons: the simultaneity between unionization and workers' welfare and missing variables. The ideal method to deal with these two issues is to find a proper instrumental variable for unionization. Yet it is difficult to find a credible instrumental variable at the firm level that affects unionization but does not directly affect workers' welfare. To mitigate the problem, we add three sets of additional controls to test the sensitivity of estimated unions' effects. The first set contains variables that measure market conditions and supply-chain pressures on labor protection. The second set covers a diverse range of measures of firms' own awareness of labor unions, including perceived peer pressures, political connections, and corporate social responsibility (CSR) performance. The third set includes three variables describing firms' financial performance. Controlling for firm performance allows us to obtain more accurate estimates for the union effects to the extent that worker welfare and unionization are both correlated with firm performance.

We also explore two channels for unions to improve workers' welfare: individual written contracts and collective wage contracts. Collective contracts are one of the main functions for the union to improve worker welfare in advanced economies. One of the ACFTU's core mandates is to promote collective and individual contracts. These two kinds of contracts do not necessarily provide better terms to workers than required by law, but they do increase firms' expected costs in cases where firms have violated the contracts. In our empirical analysis, we first try to establish positive links running from unionization to the two kinds of contracts and then from the contracts to better worker welfare. We also explore the interactions between unionization and the two kinds of contracts to see if they have independent influences on workers' welfare.

Studies on the roles of unions are relatively new in China, although the literature regarding this on advanced countries is abundant. Most existing studies on China are case studies. A common theme covered by these studies is the changing role for China's unions at an opportune time (see Clarke 2005; Friedman and Lee 2010). Specifically, Friedman and Lee

(2010) regard the transition of China's official unions as a contribution to the state's effort to individualize and institutionalize labor conflict resolution through labor law and arbitration mechanisms. The unions' roles in organizing welfare programs, providing training services to employees, and mediating and arbitrating disputes are well documented (Metcalf and Li 2005; Ge 2007; Zhang 2009). Mechanisms for labor relations, in particular the tripartite consultation scheme, are also noticed (Shen and Benson 2008; Lee 2009).⁴ However, the issue is debatable on whether unions are effective in protecting workers' rights. On the one hand, many studies regard unions' functions as essentially "managerial" (Chan 2009; Nichols and Zhao 2010), peace-making (Zhang 2009), or serving as mediators rather than as workers' representatives or "protectors" (Clarke and Pringle 2009; Lee 2009). On the other hand, some studies have found that, depending on the organizing structures and strategies (Lee 2009; Liu 2010), as well as workers' awareness (Chan 2009) and activism (Clarke and Pringle 2009), unions are searching for real effectiveness. In addition, Zhang (2009) finds that workers do use both unions and official channels for their own gains; and Lee (2009) provides evidence that suggests that unions and collective bargaining are starting to exert an influence on labor market outcomes.

Ge (2007) and Lu, Tao, and Wang (2010) offer two quantitative studies on unions' effects on a wide range of employee benefits and firm performance. The study by Ge (2007) is based on a data set of more than 1 million firms obtained from the First National Economic Census conducted by China's National Bureau of Statistics (NBS) in 2004. In addition to providing a rich description of unions' role, Ge finds that unionism is positively related to workers' wages and benefits, labor productivity, research and development, and human capital investment, but negatively related to firm profitability. Lu et al. (2010) use a 2006 sample of 3,837 private firms to study unions' influences on labor productivity and profitability, as well as the union effects on wages and other benefits. They find in various specifications, including an instrumental variable estimation, that unions significantly increase labor productivity but do not have any significant influence on profitability. They have obtained a strong result showing that unions do not increase wages although they promote a wide range of other benefits, such as pension, medical insurance, and unemployment insurance. Finally, they find that unions promote individual and collective contracts.

Our study improves on Ge (2007) and Lu et al. (2010) in two areas. First, we study wages, working hours, and pensions in a SUR model in

⁴ The tripartite consultation scheme involves the union, the enterprise, and the government in labor disputes. Both Shen and Benson (2008) and Lee (2009) view it as a first step toward more genuine and new practices of collective bargaining.

addition to a wide range of other employee benefits. This study allows us to conduct a more careful examination of the union's wage effect. Both Ge (2007) and Lu et al. (2010) measure wages by dividing the total payroll by employment, though neither of them studies working hours. However, Andrews et al. (1998) find that union wage differentials are higher when measured in terms of hourly earnings than when measured in terms of weekly earnings. This is so because union workers work fewer hours per week than nonunion workers on average. In their case study, Chan and Siu (2010) also suggest that calculating labor compensation using hourly wages is a much more reliable and transparent tool than using monthly wages. Therefore, taking into account working hours when wages are studied is important. Second, we take a serious step to study unions' effects on individual and collective contracts and their interplays to influence worker benefits. Lu et al. (2010) have studied unions' effects on individual and collective contracts, but they do not treat the contracts as a channel for unions to influence worker benefits.

The rest of this article is organized as follows. In Section II, we describe the institutions within which Chinese unions operate. In Section III, we introduce our data and present detailed comparisons of unionized firms and nonunionized firms on a wide range of indicators. In Section IV, we first present the baseline results of the SUR model and then deal with the three issues that may confound the baseline results. In Section V, we test two channels—individual written contracts and collective wage contracts—and their interactions with unions to affect worker welfare. Finally, in Section VI, we conclude by discussing the implications for China's union development.

II. Institutional Background

In China's planning era (1952–78), urban employment was dominated by the state sector, although a marginal employee-run collective economy existed. The government provided workers in the state sector with an "iron bowl," namely, guaranteed lifetime employment, generous fringe benefits, housing, and children's education. Since the 1980s, lifetime employment was terminated, and more flexible, market-based employment contracts were introduced. Since the 1990s, two concurrent events have changed employment relations in China. One event was the fast development of the private sector and the vast privatization of SOEs, which led to a dramatic switch from the state sector to the private sector in urban employment. In 1988, the state sector's share in employment was 70%, but in 2008 the private sector's share became 77% (MLSS 2009). The other major event was the influx of migrant workers from the countryside, which has further changed the employment relations in the urban sectors. Since 1998, an average of 8.7 million migrant workers were added to the

urban labor force each year (NBS 2010). Migrant workers do not have the local *hukou*, or residential registration, and thus they are often treated with conditions inferior to those of local workers. Many local pension regulations, medical care policies, and employment practices discriminate against migrant workers. For this reason, companies often use migrant workers instead of local workers. Accompanying those dramatic changes was a period of informalization (or casualization) of the workplace. "Informalization" refers to the phenomenon of substituting informal employment, such as temporary, seasonal, casual, and part-time or hourly-paid work, for formal employment. Between the mid-1990s and the mid-2000s, when SOE privatization was at its highest point, policy makers and academics advocated for informal employment as an effective way to absorb laid-off workers (Cooke 2011). However, not having been effectively regulated by law, informalization of employment relations has weakened labor protection of both informal and regular workers (Friedman and Lee 2010).

As a response to worsening labor relations and as part of a broader attempt to reduce social conflict, the Chinese government has institutionalized a series of labor legislations; meanwhile, the government has also encouraged the ACFTU to play a larger role in protecting workers' rights.⁵ Using the rich information provided by his large data set, Ge (2007) provides a detailed description of what unions do in China. In this section, we introduce the legal environment for worker protection and union activities, an area less discussed by Ge (2007). As commented by Lee (2009), "the speed and scale of the state-driven institutionalization of industrial relations in China is unprecedented in the modern history" (18). In the 2000s alone, there were 11 major labor laws or regulations being developed or revised. Among those laws, the most important are the Labor Law, the Labor Contract Law, and the Union Law.

The Labor Law and the Labor Contract Law set up a legal framework to regulate labor relations. The Labor Law provides general guidance, and the Labor Contract Law provides more specific clauses. Interestingly, both laws are set to advance economic growth. The Labor Law begins with the stipulation that the law is enacted for the purposes "to protect the legal rights of workers, regulate labor relations, establish and maintain the labor institutions that are suitable for the socialist market econ-

⁵ It is noteworthy that the ACFTU was in crisis in the second half of the 1990s. According to Chan (2008), the crisis was both in terms of finance and membership. On the one hand, with the enterprise reform, firm-level decision-making power had been decentralized to the management, so there was not much that the ACFTU could do if the management decided not to allocate the union staff a budget. On the other hand, union membership declined sharply when a large amount of SOEs were being privatized.

omy, and promote economic development and social progresses" (Article 1). That is, the law gives equal weights to the protection of employees' legal rights and the promotion of economic growth. Despite their deficiencies, those two laws would provide a fair amount of protection to workers if they were seriously implemented. Since it was first introduced in 1994, the Labor Contract Law has been revised three times (December 2006, April 2007, and June 2007). Its newest version took effect in January 2008. This step is perhaps the greatest that the Chinese government has taken in the past decade to strengthen labor rights (Friedman and Lee 2010). One of the aims of the revision was to perfect the labor contract system by formalizing workers' rights with written contracts and collective bargaining; another major purpose was to increase the formal power of labor unions. Specifically, the Labor Contract Law requires that "a written labor contract should be signed within one month after the date the employer starts using the worker" (Article 10) and that "a collective contract, one applying to all workers in an enterprise, can be signed by the labor union after bargaining on an equal basis with the employer" (Article 51). In addition, "special collective contracts can be signed addressing certain specific issues, such as labor safety and hygiene, the protection of the rights and interests of female workers, as well as wage adjustment mechanisms" (Article 52). Also, "if an employer is to terminate a labor contract unilaterally, it shall first inform the labor union of the reason. The labor union shall have the right to demand that the employer make the necessary adjustment if the employer violates laws, administrative regulations or the labor contract. The employer shall consider the opinions of the labor union and notify the labor union in writing of the outcome of its handling of the matter" (Article 43).

The Union Law is meant to set up the legal framework for unions' operation. The law stipulates the rights of workers in unions as well as procedures to establish a union. It further requires that unions be independent of enterprise management but participate in the management on the workers' behalf. Nevertheless, the law also puts constraints on unions to advance workers' welfare. For instance, it stipulates that "trade unions shall observe and safeguard the Constitution, take it as the fundamental criterion for their activities, take economic development as the central task, uphold the socialist road, the people's democratic dictatorship, and the leadership by the Communist Party of China" (Article 4, 2001 revision). This stipulation means that all unions are put under the control of the government. Moreover, the law requires that part of the funding of the union come from the company. To be exact, a unionized firm has to pay 2% of its payroll to the local ACFTU chapter and the government and 0.5% of its payroll to finance its own union.⁶ In practice, the union

⁶ Ge (2007) finds that enterprises' overall union contribution, as a share of payment, is 1.6% for state-owned enterprises, 1.5% for domestic private enterprises,

chair is often an employee and paid by the company. Therefore, a union needs the consent of the management to be set up within a company. In addition, the law does not stipulate explicitly that strikes are legal means for workers to seek their benefits, although it and other laws do not ban strikes.

At the functional level, the ACFTU is the only officially recognized labor organization. Any grassroots union must be approved by and put under the leadership of the ACFTU's local chapters. The control of the ACFTU is hierarchical. At the national level, the ACFTU directly controls 10 national industrial unions and 31 provincial unions.⁷ The hierarchical structure is replicated in those subordinate unions by administrative jurisdictions until it reaches the firm.

Looking at the legal framework that governs union activities, a natural question is whether unions can really represent workers' independent interests. In recent years, however, the government has been encouraging the ACFTU to assume a more active role in protecting workers' welfare. It does this for two reasons. One is to contain social distress caused by low labor standards. This reason is consistent with the government's efforts to revise the Labor Contract Law and its aim to build a harmonious society. The second reason is that the government wants to bring labor movements under its control. In the past decade, there have been mounting spontaneous worker protests in China, including wildcat strikes (such as the strike in one of the Honda subsidiaries in 2010), sit-ins in foreign-owned factories, and street protests by laid-off workers. According to statistics from the Ministry of Public Security, the number of "mass incidents" rose dramatically, from 15,000 in 1990 to 74,000 in 2007 (Wang et al. 2009). Clearly, labor issues have become a major source of social tension and conflict, and they could become a force against the government if they are allowed to develop along their own trajectory.

Responding to the government's initiative, the ACFTU has set promoting collective wage bargaining and written contracts as one of its top priorities (ACFTU 2006). Collective bargaining produces collective contracts. In a typical collective wage contract, the company and the workers agree on terms of wage standards, wage growth, and procedures for

0.8% for Hong Kong, Macao, and Taiwanese enterprises, and 1.3% for other foreign-invested enterprises.

⁷ Liu (2010) finds that some local and regional unions were effectively using collective bargaining to advance workers' interests. He suggests that "union associations organized through this [regional- and industrial-level bargaining] pattern can replace employer-controlled grassroots unions as workers' bargaining representatives, transform the unions' administrative power and state support into substantive bargaining power, and gain certain benefits for workers" (44). Clarke and Pringle (2009) also suggest that negotiations of sectoral and regional agreements are more effective and that workplace trade unions should be encouraged to incorporate them into the enterprise collective agreements.

making changes.⁸ By the end of 2009, 2.11 million enterprises had signed collective contracts, covering 161.96 million workers nationwide.⁹ However, Clarke, Lee, and Li (2004) and some other authors (e.g., Ge 2007; Chan 2009) have noticed that unions only bargain for the employers' meeting minimal legal standards, and "collective contracts provide workers with few or no benefits not already prescribed by laws and regulations." In spite of this, the ACFTU's aim is to have every unionized company sign a collective wage contract with its workers by 2012.¹⁰

In reality, collective contracts are increasingly becoming a tool for unions to safeguard workers' rights. The management has begun to take unions seriously and to settle work-related issues in collective bargaining, and wage negotiations have created a greater degree of immediate interest among workers (Lee 2009). For example, Chan (2009) documents tangible fruits that the union has gained in the collective bargaining process, although "all parties involved did not use the expression 'collective bargaining'" (305). Companies are willing to work with unions for two reasons. First, companies want to maintain good relations with the government and a positive corporate profile. As our empirical analysis will show, companies with closer political ties with the government are more likely to allow union activities. Other evidence shows that companies more aware of CSRs are more likely to set up unions (Shen and Yao 2009). Second, companies also use unions as a labor management tool. Because collective bargaining often just reiterates the minimum standards promised by law, the financial burden a company shoulders is not excessive. In this case, the union can play a buffering role that shields companies from any aggressive demands from workers.

Apart from collective wage contracts, written contracts for individual workers are also promoted. They are particularly important in non-unionized enterprises and in unionized enterprises without collective contracts. Moreover, written contracts are more likely to take into account individual workers' heterogeneities in education, experience, and skills. The positive role of written contracts is well documented. For example, Liu (2010) notes that, in several cases, the lack of written contracts was the cause for arbitrarily reducing workers' wages; Zhang (2009) documents

⁸ As an example, see the template provided by the Xinjiang Autonomous Region government: http://www.xjrs.gov.cn/show_files.asp?ArticleID=4092. Liu (2010) documents the case of the Zeguo Water Pump Industry Union Association, which produced a wage agreement for firms in the industry, specifying detailed minimum pay scales and minimum monthly wages. The agreement increased workers' monthly wages by 5%–8%, decreased the turnover rate, and relaxed labor shortage in the industry (Liu 2010, 46).

⁹ See http://www.humanrights-china.org/cn/rqlt/rdpl/mtpl/t20100704_618286.htm for more information.

¹⁰ See <http://sports.eastday.com/eastday/finance1/m/20100702/u1a5306051.html> for more information.

quite a few stories in which workers lost their cases in arbitration because there were no signed contracts. "Without a written contract, the labor bureau cannot process a grievance" (527). In contrast, in the three companies documented by Metcalf and Li (2005, pt. 3 in sec. 3), where labor disputes were rare, all of them "emphasized the importance of individual contracts." Clearly, written contracts do increase companies' expected costs of contract violations because the contracts imply legal consequences.¹¹

Compared with collective contracts and collective disputes, the role of unions is larger in individual disputes and contracts. According to Chen (2003), unions only take up collective disputes when management is "patently in the wrong" and cases are "absolutely winnable," and they avoid "complicated ones," whereas unions are more visible when dealing with individual cases, such as safety, retirement (e.g., because of disability), and nonpayment of wages (Metcalf and Li 2005).¹²

III. Data and Descriptive Analysis

A. The Data

The data we use come from a survey conducted by the International Finance Corporation (IFC) on the CSR of Chinese firms in spring 2006. The survey was conducted on 1,268 firms in 12 Chinese cities (from north to south: Changchun, Dandong, Chifeng, Beijing, Shijiazhuang, Xi'an, Zibo, Chongqing, Shiyang, Wujiang, Hangzhou, and Shunde). The 12 cities were chosen based on representation rather than on a random method. Beijing and Chongqing are two provincial-level cities. Changchun, Shijiazhuang, Xi'an, and Hangzhou are provincial capitals of Jilin, Hebei, Shanxi, and Zhejiang, respectively. Wujiang and Shunde are county-level cities. The other cities are medium-sized prefecture-level cities.¹³ Beijing, Wujiang, Hangzhou, and Shunde are located on the coast; Chifeng, Xi'an, Shiyang, and Chongqing are located in the country's western region; and

¹¹ Although the legal system is still weak, recent studies have found that firms take a serious view regarding the court. For example, Shen and Yao (2009) find that 72% of their sample firms chose the court as the means to settle commercial disputes (191). Moreover, according to Friedman and Lee (2010, 517), "as a consequence of the government's promotion of 'rule by law,' the promulgation of labor legislations, and the reform of the labor dispute resolution system, there has been a massive increase in formally processed labor disputes."

¹² Wage arrears are common, especially for migrant workers, and they often lead to open street protests. To avoid protests, the government pays strong attention to wage arrears. Premier Wen Jiabao even personally helped a woman worker to get her wages back. Written contracts do not preempt wage arrears, but as a legal constraint, they may oblige companies to behave differently. See State Council Document 2010 [No. 4] at http://www.gov.cn/zwggk/2010-02/05/content_1529273.htm.

¹³ There are three categories of cities in China: provincial level, prefectural level, and county level. Shunde is currently a district in Foshan, but it was an independent county-level city until 2003.

the rest are located in the central region. Changchun, Xi'an, and Chongqing used to be among China's industrial powerhouses, but they have gone through a painful transformation in the past 2 decades because of the economic shift from the hinterland to the booming coastal regions. Beijing, Hangzhou, Wujiang, and Shunde are experiencing fast growth in industries and services. Zibo is catching up in industrial development, but its service sector is relatively lagging behind.

The NBS was commissioned to carry out the survey. In each city, 100 firms were planned to be randomly selected from companies that had an annual sales volume larger than 5 million yuan.¹⁴ However, some cities surveyed more than 100 firms. A stratified sampling strategy was adopted to select the sample firms. The first stratum was firm ownership. Firms were divided into three categories: SOEs, DPEs, and FIEs.¹⁵ The shares of these three categories of firms in a city were used in the sampling. The second stratum was firm size, which also included three categories: large, medium, and small firms. The definitions of these three size categories were the same as those used by NBS in its routine statistics, which were defined by the State Economic and Trade Commission (SETC 2003). The shares of firms of these three size categories in a city were used in the sampling. With this sampling strategy, we obtained a representative sample for the 12 cities. Our analysis is confined to the 12 cities and is not intended to make inferences for the whole country because the cities were not randomly selected.

The NBS's local offices administered a questionnaire completed by the firm managers. Training was provided before the survey. The questions related to firms' CSR awareness and performance in labor protection, quality control, corporate governance, and environmental protection. There were also questions about market conditions, management composition, and external finance. In addition, the NBS provided data for the sample firms' annual financial performance between 2001 and 2005.

B. Unionization and Workers' Welfare in the Sample

Because we do not have data on individual workers, "unionization" is defined by the observation that a firm has a union and firm-level aggregate indicators measure workers' welfare. In the sample, 854 firms are unionized. They account for 69% of the whole sample. This density is higher than documented in Ge (2007), mainly because our sample includes only

¹⁴ NBS only maintains a database for firms with a sales volume larger than 5 million yuan.

¹⁵ SOEs are firms in which the state has controlling shares. DPEs include companies with mixed ownerships but with majority private shares as well as purely privately owned firms. FIEs are firms that have foreign shares, including shares held by Hong Kong, Macao, and Taiwanese businesses. There were also collectively owned enterprises, but their number was relatively small, so they were combined with SOEs.

firms with an annual sales volume larger than 5 million yuan, so small private factories are not covered.

The Labor Law has detailed stipulations on regular working hours, overtime, and wage payments for overtime. Article 36 stipulates that regular working hours should not be more than 8 hours a day and 44 hours a week. Article 41 stipulates that overtime normally should not exceed 1 hour a day; under special circumstances, when production is urgent, overtime can be extended to 3 hours a day, but it should not exceed 36 hours a month. Finally, Article 44 defines that overtime wages should not be less than 150%, 200%, and 300% of the normal wages during a weekday, a weekend, and a national holiday, respectively. Despite these stipulations, large variations exist in the sample firms' actual practices. Our survey asked managers the average monthly wages (total income including salaries, bonuses, and overtime payments) of white-collar and blue-collar workers and their monthly working hours. In this article, we only study the wages and working hours of the blue-collar workers because they are the bulk of the employees. Nevertheless, the firm-level average wage of blue-collar workers and that of white-collar workers are highly correlated. Their correlation coefficient is 0.76, which is significant at the 1% level. We obtain hourly wages by dividing average monthly wages by monthly working hours. The lowest average hourly wage paid by the sample firms is merely 1.19 yuan. The highest, in contrast, reaches 51.25 yuan, while the average hourly pay is 5.90 yuan.¹⁶ As for working hours, we study monthly working hours because many firms arrange their production cycles and give workers break days by month. The average working hours in the sample is 181 hours a month. However, the most demanding firm asks its employees to work for 336 hours a month, or more than 80 hours a week.¹⁷ In contrast, the lowest requirement in the sample firms is just 80 hours of work in a month.¹⁸

Firms provide pension and other fringe benefits to select employees, although the law requires the company to provide the benefits for every

¹⁶ The national average of annual urban employee salary was 23,969 yuan in 2006. (See NBS's official website at <http://www.stats.gov.cn/tjsj/ndsj/2006/indexch.htm>.) If we assume 26 working days in a month and 8 working hours a day, that is, 208 hours a month, the maximum regular working time stipulated by the Labor Law, and excluding national holidays, then the national average hourly wage was 9.65 yuan, which is much higher than in our sample. This gap may be caused by the fact that our sample firms are mainly in the manufacturing sector, which pays lower wages than other sectors.

¹⁷ This high number is not abnormal. Chan and Siu (2010) conducted a survey in 2006 in a toy factory and a garment factory that provided supplies to Wal-Mart Stores Inc. and found that the average monthly working hours of their sample workers were 302 hours.

¹⁸ This is a smelting plant in Jining. It is not like an idle plant because its monthly wage is 900 yuan per worker, which is 85% of the average monthly wage in the sample.

employee. Pension coverage was recorded in the survey by a variable in which the values range from 1 to 5, representing coverage of less than 20%, 20%–40%, 40%–60%, 60%–80%, and 80%–100%, respectively. The average pension coverage in the sample is 3.89, or about 77.8%.¹⁹ It is noteworthy that the proportion of local workers getting pensions is much higher than that of migrant workers. The ratio of firms paying most (more than 60%) of the local workers' pensions is 63.7%, while only 47.6% of the sample firms do so for migrant workers.

In table 1, we compare workers' welfare in unionized and nonunionized firms in terms of seven sets of indicators. The first set contains the three major welfare indicators, namely, hourly wage, monthly working hours, and pension coverage. The average wage offered by unionized firms is 17.3% higher than by nonunionized firms, while the average monthly working hours in unionized firms is 9 hours less. The gap for pension coverage is even larger. Table 1 shows that it is one unit, which is 20 percentage points when translated into a percentage. The second set of indicators concerns three other kinds of insurance, covering unemployment, general medical expenditure, and accidents. Unionized firms lead nonunionized firms in all three indicators.

The rest of the sets of indicators cover training and accidents, severance benefits offered to fired workers, amenities (clinics and child-care centers), employee tenure, and bargaining and contract. Although it is clear that unionized firms perform uniformly better than nonunionized firms across all the indicators, three points are worth emphasizing. First, in 2005, the number of workplace accidents per thousand workers in unionized firms was only half the number in nonunionized firms. Second, workers stay in a unionized firm more than twice as long as in a nonunionized firm. Third, although unionized firms are more likely to allow collective wage contracts than nonunionized firms, the gap between the two groups is much smaller when it comes to individual written contracts. That is, many nonunionized firms also offer individual written contracts. Section V shows how unions, individual contracts, and collective contracts affect workers' welfare.

C. Other Union Characteristics

Unionized firms differ from nonunionized firms in other aspects, and those differences may affect workers' welfare. In our econometric exercises, we always control with three sets of dummies: city, industry, and ownership (which we will subsequently refer to as "control dummies"). They are meant to capture inherent regional, industrial, and historical dif-

¹⁹ According to CNpension.net, the national figure was 76%. See http://www.cnpension.net/index_lm/2010-01-26/1034775.html for full information.

Table 1
Unionized Firms and Nonunionized Firms: Welfare Indicators

Item	Observations	Unionized Firms	Nonunionized Firms
Unionization (0, 1)	1,236	.69	.31
1. Main welfare indicators:			
Average hourly wage (yuan)	1,203	6.2***	5.2
Average monthly working hours (hours)	1,221	178***	187
Pension and other insurance coverage (1–5) ^a	1,134	3.8***	2.8
2. Other insurance coverage:			
Unemployment insurance coverage (1–5)	1,072	3.5***	2.3
Government-sponsored medical insurance coverage (1–5)	1,041	3.4***	2.4
Workplace accident insurance coverage (1–5)	1,086	4.1***	3.5
3. Trainings and accidents:			
Pre-post training on workplace safety (0, 1)	1,222	.98***	.95
Workplace accidents per 1,000 workers in 2005	868	5.7***	10.9
Training plans (0, 1)	1,204	.88***	.78
Number of trainings organized last year	1,117	5.1	3.5
4. Severance benefits:			
Severance payment (1–4) ^b	1,034	2.74***	2.45
Time of advance notice (1–4) ^c	1,181	2.62***	2.29
5. Amenities:			
A clinic in the factory (0, 1)	1,228	.28***	.10
A child-care center in the factory (0, 1)	1,221	.08***	.01
6. Workers' tenure:			
Average tenure of blue-collar workers (years)	1,204	7.7***	3.4
Average tenure of clerks (years)	1,200	8.5***	4.1
7. Bargaining and contracts:			
Number of negotiations on wages in the past 3 years	998	.81***	.44
Allowing collective wage bargaining (0, 1)	1,150	.56***	.47
Allowing collective wage contracts (0, 1)	1,158	.34***	.19
Signing written contracts with individual workers (0–2) ^d	1,222	1.81***	1.54

^a Pension and other insurance coverage is a variable whose values range from 1 to 5, representing a coverage of less than 20%, 20%–40%, 40%–60%, 60%–80%, and 80%–100%, respectively.

^b Severance payment is reported as a share of monthly salary, with 1–4 denoting, respectively, 0%–20%, 20%–50%, 50%–100%, and more than 100%.

^c Time of advance notice is reported on the following scale: 1 = 1 week; 2 = 2 weeks; 3 = 1 month; 4 = more than a month.

^d Signing written contracts with individual workers is constructed from the question: Does your company sign written contracts with workers? 2 = all workers; 1 = some workers; 0 = no.

*** The average for unionized firms is significantly different from the average for nonunionized firms at the 1% significance level.

ferences among the sample firms. For industry, we have five groups: agriculture, mining, manufacturing, utilities, and services. For ownership, we have four groups: SOEs, DFEs, HMTs (Hong Kong, Macao, and Taiwanese firms), and other FIEs.²⁰

Table 2 presents four other sets of variables that set unionized firms apart from nonunionized firms. The first set contains the following variables that describe a firm's basic characteristics: capital intensity, employment, management education, employee education, and the share of migrant workers. The last three variables are constructed from questions with categorical answers coded by cardinal values, with higher values indicating better management education, better employee education, and higher shares of migrant workers, respectively. The note for table 2 presents the exact definitions of these values and the values of other categorical variables. In our econometric exercises, we simply use these cardinal values when the categorical variables are included as independent variables.

Subsequently, we will call this group of variables and the three sets of control dummies for cities, industries, and ownership "the baseline controls." We understand that many variables in this group may be simultaneously determined with workers' welfare. For example, firms may be simply price-takers in the labor market, so they have to treat wages as given and then decide how many workers to hire and how much investment to make. We nevertheless treat this group of variables as baseline control variables for the following reasons. The equations we estimate for our baseline SUR model represent the first-order conditions in a firm's profit maximization problem. That is, we are effectively estimating the marginal product of labor and its auxiliary marginal contributions (fringe benefits). Therefore, it is essential to control for the stocks of capital and labor, or alternatively, as we do, to control for capital intensity and labor. Then the management and employee education variables are meant to accomplish two things. The first is to measure the quality of the labor force, and the second is to capture the management's and employees' awareness of labor protection—better-educated managers may be inclined to offer workers better treatment (Mengista and Xu 2004; Liu 2010), and better-educated employees may be more aware of their rights (Liu 2010). The share of migrant workers takes into account the institutional setting in which migrant workers are discriminated against in the labor market (Wang et al. 2009; Friedman and Lee 2010). In addition, migrant workers are less likely to join the union. By the end of 2009, 41 million out of 226

²⁰ HMTs are separated from other FIEs because the literature finds that they perform systematically differently from other FIEs (see Ge 2007; Shen and Yao 2009).

Table 2
Unionized Firms and Nonunionized Firms: Control Variables

Item	Observations	Unionized Firms	Nonunionized Firms
1. Baseline control variables:			
Capital intensity (million yuan per worker)	1,151	.20***	.12
Employment (100 people)	1,151	9.81***	2.20
Management education (1–4)	1,223	2.38**	2.23
Employee education (1–4)	1,229	1.50	1.44
Migrant workers (1–5)	1,169	1.88***	2.49
2. Market conditions:			
Provincial market share (1–6)	1,095	4.07***	3.30
Government restrictions on entry (0, 1)	1,176	.35	.34
Export (1–6)	1,172	.92	1.06
Customer requirement of labor standards	1,236	.72	.70
Listing (1–4)	1,236	1.46***	1.33
External auditing (0, 1)	1,193	.80***	.69
3. Self-awareness:			
Union versus management (1/3–3)	881	1.02***	.70
Contracts in nearby firms (1–3)	1,085	2.45***	2.16
PC or PPCC membership (0, 1)	1,219	.46***	.23
CSR awareness (1–3)	1,154	1.92***	1.74
Charity donation (0, 1)	1,152	.34***	.24
4. Financial performance:			
Pretax profit rate (%)	1,151	7.5	7.2
Per-worker sales (million yuan)	1,151	.45	.48
Overdue loans (0, 1)	1,137	.10***	.06

NOTE.—*Capital intensity* is per-worker fixed capital (1,000 yuan). *Employment* is the number of workers (100 people). *Management education* takes values 1–4, indicating the share of management with college or higher diplomas of 0%–20%, 20%–40%, 40%–60%, and more than 60%, respectively. *Employee education* is constructed in the same way. *Migrant workers* is the share of migrant workers, with 1–5 denoting, respectively, less than 20%, 20%–40%, 40%–60%, 60%–80%, and 80%–100%. *Provincial market share* comes from the six categorical answers provided by the questionnaire and takes values of 1–6 representing, respectively, the shares of 0%–1%, 1%–3%, 3%–5%, 5–10 percent, 10%–20%, and more than 20%. *Government restrictions on entry* is the firm's answer to *Export* comes from the question asking a firm's share of export in its sales, with 1–6 meaning, respectively, 0%, 0%–20%, 20%–40%, 40%–60%, 60%–80%, and 80%–100%. *Customer requirement of labor standards* comes from a question asking a firm whether most of certain types of their client companies make requirement on labor standard. There are six types given by the question, including domestic SOE, DPE, middle and small scale FIE, multinational FIE, exporting companies in developed countries, and exporting clients in developing countries. A firm gets a score of 1 if it answers for one type, and the value of the variable is the sum of all six types. *Listing* comes from a question giving the sample firms four answer choices regarding their status of public listing and takes values from 4 to 1, representing, respectively, already listed, in the process of listing, plan to be listed, and no such a plan. *External auditing* comes from the question, 0 = no; 1 = yes (dummy variable). *Union versus management* comes from the question, 1 = rare, 2 = moderate, 3 = often; it is constructed by dividing the answer for by that for *Contracts in nearby firms* comes from the question asking a firm thus, 1 = few; 2 = some; 3 = very common. *PC or PPCC membership* denotes whether any member in the management holds a position in the People's Congress (PC), China's legislative body, or the People's Political Consultation Conference (PPCC). *CSR awareness* is the response by the manager to the question, Are you aware of any standard on corporate social responsibility such as SA8000? 1 = no; 2 = have heard of it, yes, but don't know it well; 3 = know it. *Charity donation* is the answer to the question, 0 = no; 1 = yes (dummy variable). *Per-worker sales* is sales (1 million yuan) per employment. *Pretax profit rate* is (profits + tax)/sales. *Overdue loans* is the answer to the question, 0 = no; 1 = yes (dummy variable).

** The average for unionized firms is significantly different from the average for nonunionized firms at the 5% level.

*** The average for unionized firms is significantly different from the average for nonunionized firms at the 1% level.

million union members were migrants, although the migrants' share in total urban labor force was 34% in the same year.²¹

The second set of variables contains six variables that describe firms' external market conditions: provincial market share, government restriction on entry in the industry, share of export, customer requirement of labor standards, the status of listing, and external auditing. The first two variables measure a firm's market power. Supposedly, a better position in the market allows the firm to have more room to treat its workers better. The third and fourth variables are indicators for external pressures coming from the value chain. Exporters may be more likely to comply with labor standards because they are subject to international pressures (Greenhill, Mosley, and Prakash 2009). However, in China's case, exporters are more labor intensive than other firms and tend to hire workers with less education, so they may not offer as much to workers as other firms do. Indeed, some people believe that China, as the "world's factory," is the main driver for the "race to the bottom" of global labor standards (Chan 2009). In contrast, customer requirements have unambiguous effects on firms to improve labor standards because, in a highly competitive market like the one in China, clients have considerable leverage over their suppliers (Ngai 2005). For example, Chan (2009) reports a case in which Reebok launched a pilot project (that finally failed) to hold workplace union elections as a means to improve labor conditions for employees of its suppliers. Finally, the status of listing and external auditing measure market pressures from third parties. A number of auditing firms, such as Ernst and Young Global Ltd., have begun to offer services in labor rights auditing (Athreya 2004). However, Chan and Siu (2010) find in their surveys general failures of auditing to detect violations of key labor standards.

The third set of variables accounts for firms' self-awareness of labor protection. The first two variables describe firm managers' perception of unions' role in nearby firms. The first variable, union versus management, is from a question about the relative importance of management, union, government, external arbitration agencies, and court in solving labor disputes in other local firms of the same industry. The manager was asked to give a score ranging from 1 to 3 on the five actors, with higher values indicating higher degrees of importance. We create the union versus management variable by dividing the score assigned to the union by the score assigned to the management, so its values range from 1/3 to 3. The second variable is the manager's perceived percentage of nearby firms that offer individual written contracts to their workers. The third variable is a dummy indicating whether any member in the management holds a po-

²¹ Data came from the official website of Xinhua News Press at http://news.xinhuanet.com/ziliao/2004-11/15/content_2220527.htm.

sition in the People's Congress (PC), China's legislative body, or the People's Political Consultation Conference (PPCC), a sort of house of nobility in the Chinese system. Holding a position in those two political bodies brings tangible gains to firms, especially to private companies (Chan 2000). However, becoming a public figure, the manager also has to care about the firm's public image, which establishing a union and treating workers better would both improve (Liu 2010). The last two variables are about firms' CSR awareness and donations, respectively. Firms that are more aware of CSR and that donate more often may treat their workers better and are more likely to establish unions.

The last set of variables describe firms' financial performance, pretax profit rate (profits per sales), per-worker sales, and overdue loans. The last variable is a dummy and comes from this question: "Has your firm been unable to pay back loans in due time at least once in the last three years?" There are two different arguments for the relationship between unionization and firms' financial performance. One follows that unions are only possible if the firm management approves them. So by this argument unionization should be positively correlated with firms' financial performance. This relationship may be reinforced in that unionized firms usually enjoy strong relations with the government, so they have a certain degree of bargaining power in the firm-bank relationship. They may also conduct strategic defaults, waiting for the government to write off their debts. The other argument asserts that unions hurt firm profitability because they increase wages and other labor-related expenditures. In our sample, unionized firms have lower per-worker sales but a higher average profit rate. In addition, unionized firms have a default rate almost twice the rate of nonunionized firms. No matter what the relationship is, however, workers' welfare is likely to be positively correlated with firms' financial performance. Indeed, they can be determined simultaneously. To avoid this problem, we will also employ lagged values of the three financial variables.

IV. Results of the SUR Model

Before presenting the results of the SUR model, we first provide a rough idea on how unionism is associated with firm characteristics by running a probit regression of the unionization dummy on all the control variables we discussed in the previous section. The results are reported in table A1 in the appendix. Employment, share of migrant workers, provincial market share, manager's perception of union versus management, and manager's perceived share of nearby firms offering individual contracts are all highly significant. Larger firms are more likely to have unions, which is a result consistent with the literature (e.g., Andrews et al. 1998; Ge 2007). As expected, firms with more migrant workers are less likely to have unions,

but firms with larger market shares are more likely to do so. Finally, the two perception variables are positively correlated with firms' own status of unionization. There could be two interpretations for this result. One is that peer pressure or demonstrations encourage firms to have unions. The other is simply that managers were thinking about their own firms when they answered the relevant questions so they would have positive perceptions of nearby firms if their own firms had unions. In addition to those highly significant variables just mentioned, two variables are weakly significant. One variable is political connection, and the other variable is overdue loans. Both are positively correlated with unionization. The result of political connection is expected, and the result of overdue loans may be caused by unionized firms' larger bargaining power. Interestingly, among the insignificant variables, unionism is not significantly correlated with firm profitability and per-worker sales. The first result agrees with the findings from Lu et al. (2010) and is different from that found by Ge (2007) that unionism is negatively associated with firm profitability. The second result is different from Ge (2007) and Lu et al. (2010), who find significant correlation between unionism and labor productivity. We warn the reader, however, that the results are all more indicative than causal.

A. The Econometric Model

Let W_i , H_i , and P_i be the average hourly wage (in yuan), monthly working hours (hours), and pension coverage of firm i , respectively. Taking the natural logarithm for wages and working hours, we estimate the following SUR model of three equations for the baseline effects of unionization:

$$\log(W_i) = \beta_{w1} + \beta_{w2}U_i + \beta_{w3}Z_i + \beta_{w4}D_i + \varepsilon_{wi}, \quad (1)$$

$$\log(H_i) = \beta_{h1} + \beta_{h2}U_i + \beta_{h3}Z_i + \beta_{h4}D_i + \varepsilon_{hi}, \quad (2)$$

$$P_i = \beta_{p1} + \beta_{p2}U_i + \beta_{p3}Z_i + \beta_{p4}D_i + \varepsilon_{pi}, \quad (3)$$

where U_i is a dummy variable for unionization (unionized = 1, otherwise = 0), Z_i contains the baseline controls, D_i contains the extra controls discussed in the previous section, β stands for the parameters to be estimated, and ε stands for the error terms that are distributed by a trivariate normal with a mean of 0.

We should point out that equation (1) is not a conventional wage equation because the left-hand-side variable is the average wage in a firm, not the individual workers' earnings. In the same vein, equations (2) and (3) cannot be interpreted at the individual level. Admittedly, this issue ignores the individual variations within a firm. However, a worker becomes unionized as long as his or her firm is unionized. Therefore, we would still estimate the average effect of unionization at the firm level even if we had

individual-level data. Thus, focusing on firm-level aggregate indicators does not cause large distortions to our estimates of the union effects as long as we have good firm-level controls.

B. Baseline Results

In regression 1, which is reported in table 3, we report the results of the SUR model with only the unionization dummy and the three sets of control dummies of cities, industries, and ownership as the right-hand-side variables. Unions' effects on the three welfares are all significant at the 1% level, with their magnitudes being 12.6% in raising the hourly wage, 2.9% in reducing monthly working hours, and 16.8% (converted scale) in raising pension coverage. Then, in the next three columns, we report the results of regression 2, which adds the other five baseline control variables. Unions' effects are considerably reduced: 8.7% on wages, -1.6% on working hours, and 14.9% on pension coverage. In comparison, Ge (2007) obtains an estimate for unions' wage effect at 10.4%, and Lu et al. (2010) obtain a 12.4% union effect on pension coverage.

As for the control variables, higher capital intensities and higher education levels of the managers and workers are all associated with better worker welfare, whereas a large share of migrant workers has exactly the opposite effects. In addition, a larger firm, measured by employment, offers higher wages, although the effect is rather small: an addition of 100 workers is only associated with 0.1% increase of hourly wages.

For regression 2, the correlation matrix of the residuals of the three equations is the following:

$$\begin{bmatrix} 1.0000 & & \\ - .4357 & 1.0000 & \\ .2085 & - .2472 & 1.0000 \end{bmatrix}$$

All three correlation coefficients are statistically significant. Wages and pension coverage are positively correlated,²² but both are negatively correlated with working hours. Therefore, we treat regression 2 as the baseline regression for the SUR model.

C. Issues Related to Cross-Sectional Data

Following our discussions in the introduction, we check the consistency of our baseline results from three perspectives. We start with the issue of cross-sectional variations. Table 4 presents two sets of results on

²² The theoretical framework of Rosen (1986) suggests that workers who receive more generous fringe benefits are paid lower wages than comparable workers who prefer fewer fringe benefits. But later empirical findings are mixed (Currie and Madrian 1999). Using the husband's union status, firm size, and health care coverage as instruments, Olson (2002) identifies a negative correlation between the fringe benefits that wives receive and their wages.

Table 3
Baseline Results

	Regression 1			Regression 2		
	Log (Wage)	Log (Hours)	Pension Coverage	Log (Wages)	Log (Hours)	Pension Coverage
Unionization	.126*** (.024)	-.029*** (.009)	.841*** (.105)	.087*** (.023)	-.016* (.009)	.746*** (.105)
Capital intensity				.091*** (.017)	-.032*** (.007)	.149* (.076)
Employment				.001*** (.000)	-.000 (.000)	.002 (.002)
Management education				.031*** (.009)	-.011*** (.004)	.235*** (.041)
Employee education				.117*** (.015)	-.028*** (.006)	.179*** (.068)
Migrant workers				-.030*** (.009)	.015*** (.004)	-.117*** (.043)
City dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Ownership dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,037	1,037	1,037	1,000	1,000	1,000
Pseudo R^2	.319	.174	.226	.435	.242	.282

NOTE.—Standard errors are in parentheses.

* $p < .10$.** $p < .05$.*** $p < .01$.

three subsamples—DPEs, manufacturing, and Guangdong—to deal with the issues related to cross-sectional data that we discussed in the introduction. The first set of results, presented in panel A of the table, is obtained with only the union dummy and the three sets of baseline dummy controls. The second set of results, presented in panel B of the table, is obtained with the additional baseline controls added. Only the estimates for unionization are presented, however, to save space.

The DPEs account for about 68.7% of our sample firms. This percentage is quite close to what is found in the large sample by Ge (2007) of 1.3 million firms, which is 65.4%. Liu (2010) suggests that firms with different types of ownership are likely to adopt different strategies toward unions. The SOEs and the large FIEs take a strategy of cooperation and make unions an integral part of their management system. In contrast, the DPEs are more likely to use the “suppression” strategy, in which the management completely controls the union. Our analysis shows that, in the subsample of DPEs, unions’ effect on working hours is no longer significant when all the baseline controls are present in the regression. The wage effect is 6.9%, which is smaller than in the whole sample, but the pension effect is 17.5%, which is larger than in the whole sample.

Ge (2007) finds that the effects of unionization vary across industries. Metcalf and Li (2005) find that about one-third of Chinese union mem-

Table 4
Results of Subsamples

	DPEs			Manufacturing			Guangdong		
	Log (Wage)	Log (Hours)	Pension Coverage	Log (Wage)	Log (Hours)	Pension Coverage	Log (Wage)	Log (Hours)	Pension Coverage
Panel A:									
Unionization	.090*** (.026)	-.026** (.011)	.944*** (.128)	.152*** (.035)	-.018 (.012)	.845*** (.153)	.131** (.064)	-.061** (.026)	.646*** (.241)
Dummy controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	700	700	700	494	494	494	102	102	102
Pseudo R ²	.289	.107	.204	.344	.212	.241	.143	.092	.116
Panel B:									
Unionization	.062** (.025)	-.012 (.011)	.845*** (.126)	.115*** (.033)	-.005 (.012)	.767*** (.152)	.129** (.058)	-.065** (.026)	.735*** (.227)
All baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	678	678	678	476	476	476	101	101	101
Pseudo R ²	.395	.193	.282	.466	.267	.312	.350	.165	.280

NOTE.—The regressions in panel A of the table are conducted with only the baseline dummy controls, and the regressions in panel B are conducted with all the baseline controls. Standard errors are in parentheses.

* $p < .10$.
** $p < .05$.
*** $p < .01$.

bers work in the manufacturing sector. In our sample, the manufacturing sector accounts for 47% of the sample's firms, among which 71% are unionized. Table 4 shows that the unions' effect on working hours is insignificant in this subsample, even when only the dummy controls are included. When all the baseline controls are included, the unions' effect on wages is 11.5%, and their effect on pension coverage is 15.3%, both of which are larger than the comparable effects obtained in the whole sample.

According to Metcalf and Li (2005), union membership is concentrated in the east and central regions of China, but Jiansu, Jianxi, and Guangdong, which are in the east and central regions, have relatively low union densities. In our sample, 56% of firms in Guangdong are unionized as compared with 69% in the whole sample. The regression results of the Guangdong subsample are presented in the last three columns of table 4. The union effect is significant for all three welfare indicators regardless of which group of the baseline controls is included in the regressions. The unions' effect is more pronounced for wages and working hours in the Guangdong subsample than in the whole sample, although it is as good as in the whole sample for pensions.

D. Consistency of the Union Effects

Our second check is about the consistency of the union effects. Table 5 provides estimation results of unions' effects on 13 other welfare-related indicators we discussed in Section III. Unionization plays a positive and significant role on all indicators when only the dummy baseline controls are included. It remains so when all the controls are included except that regarding the number of trainings. That is, unions do have quite consistent effects on workers' welfare.

E. Additional Control Variables

Our last check is for the endogeneity of unionization. As we noted in the introduction, we try to mitigate the problem by adding into our baseline regressions the three sets of additional control variables we introduced in Section III. The results are reported in the first set of columns of table 6. Now unionization turns out to be only significant for pension coverage. Because those additional controls may be strongly correlated with unionization, a close examination of their results is worthwhile.

Among the first set of six controls reflecting the potential market pressures a firm is exposed to, higher provincial market shares are correlated with higher wages and higher pension coverage. In comparison, firms operating in industries with government restrictions on entry require workers to work longer hours. More exports in total sales reduce workers' welfare. This finding shows that the labor-intensive nature dominates potential

Table 5
Other Welfare Indicators

Regression type	Unemployment Insurance (1)		Medical Insurance (2)		Accident Insurance (3)		Pre-post Training (4)		Workplace Accidents (5)		Training Plans (6)		No. of Trainings (7)		Severance Payment (8)		Time of Advance Notice (9)		Clinics (10)		Child-Care Center (11)		Tenure of Workers (12)		Tenure of Clerks (13)			
	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS	Ordered Probit	OLS		
Panel A:																												
Unionization	.689*** (.083)		.571*** (.086)		.416*** (.088)		.418*** (.154)		-3.625** (1.589)		.370*** (.107)		.999* (.560)		.208** (.082)		.248*** (.078)		.649*** (.109)		.810*** (.285)		2.956*** (.265)		3.079*** (.285)			
Dummy controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	1,001	972	972	1,012	1,012	1,131	1,131	868	868	1,123	1,123	1,049	1,049	968	968	1,100	1,100	1,146	1,146	1,034	1,034	1,122	1,122	1,120	1,120	1,120	1,120	
Pseudo R ²	.12	.11	.11	.08	.08	.10	.10	.107	.107	.07	.07	.017	.017	.05	.05	.07	.07	.10	.10	.28	.28	.375	.375	.363	.363	.363	.363	
Panel B:																												
Unionization	.640*** (.088)		.485*** (.088)		.354*** (.092)		.285 (.173)		-3.772** (1.742)		.261** (.121)		.164 (.657)		.172* (.088)		.158* (.081)		.517*** (.116)		.691** (.291)		2.353*** (.265)		2.534*** (.287)			
All baseline controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	962	940	940	977	977	1,057	1,057	826	826	1,054	1,054	985	985	918	918	1,034	1,034	1,070	1,070	963	963	1,052	1,052	1,052	1,052	1,052	1,052	
Pseudo R ²	.15	.14	.14	.10	.10	.12	.12	.12	.12	.14	.14	.053	.053	.07	.07	.09	.09	.17	.17	.35	.35	.42	.42	.41	.41	.41	.41	

NOTE.—The regressions in the upper panel of the table are conducted with only the baseline dummy controls, and the regressions in the lower panel are conducted with all the baseline controls. Standard errors are in brackets.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Table 6
Results with Extra Control Variables

	Regression 1			Regression 2		
	Log (Wage)	Log (Hours)	Pension Coverage	Log (Wage)	Log (Hours)	Pension Coverage
Unionization	.027 (.033)	.004 (.014)	.673*** (.146)	.060** (.028)	-.006 (.011)	.794*** (.121)
Provincial market share	.014* (.008)	-.003 (.003)	.087*** (.033)	.012* (.007)	-.003 (.003)	.080*** (.029)
Restrictions on entry	-.009 (.028)	.040*** (.012)	.104 (.124)	.016 (.024)	.028*** (.010)	.156 (.107)
Export	-.012 (.010)	.004 (.004)	-.091** (.043)	-.018** (.008)	.005 (.003)	-.083*** (.037)
Customer requirement	.002 (.009)	.003 (.004)	.065 (.041)	.002 (.008)	.000 (.003)	.078** (.036)
Listing	.001 (.019)	-.001 (.008)	-.023 (.083)	.007 (.016)	-.002 (.006)	-.042 (.070)
External auditing	.037 (.034)	-.027* (.014)	.312*** (.149)	.036 (.030)	-.025** (.012)	.406*** (.130)
Union versus management	.069*** (.025)	-.022** (.010)	.235** (.108)			
Contract in nearby firms	.011 (.019)	-.015* (.008)	.273*** (.082)			
PC or PPCC membership	-.017 (.030)	.015 (.012)	.031 (.131)	-.026 (.025)	.017* (.010)	-.018 (.112)
CSR awareness	.015 (.019)	-.028*** (.008)	.064 (.085)	.034** (.017)	-.022*** (.007)	.137* (.073)
Charity donation	.005 (.032)	-.019 (.013)	-.151 (.139)	.016 (.027)	-.015 (.011)	-.079 (.120)
Pretax profit rate	.318** (.146)	.059 (.060)	-.356 (.644)	.347*** (.128)	.089* (.052)	-.321 (.562)
Per-worker sales	.006 (.025)	.014 (.010)	-.105 (.109)	.011 (.018)	.017** (.007)	-.101 (.080)
Loan default	-.125*** (.043)	.056*** (.018)	.152 (.191)	-.136*** (.039)	.050*** (.016)	.163 (.169)
Constant	1.737*** (.101)	5.237*** (.042)	1.440*** (.447)	1.861*** (.076)	5.155*** (.031)	2.266*** (.331)
All baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	549	549	549	727	727	727
Pseudo R^2	.4899	.2945	.3745	.4829	.2877	.3671

NOTE.—Standard errors are in parentheses.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

international pressures in exporting firms.²³ Requirements from customers on labor standards have a small influence on pension coverage. Public listing shows no effects on welfare; however, external auditing shows significant effects.

Among the five variables that measure managers' self-awareness, political connection, CSR awareness, and charity are either insignificant or only marginally significant, whereas managers' perceptions of the union's role in other firms are highly significant. Union versus management, a measure for the union's popularity against the management in resolving labor disputes, is significantly associated with the improvements of all three welfare indicators. And, if it were common for other local firms to sign contracts with their employees, a firm would provide higher pension coverage and require fewer working hours to its own workers.

In the last set of additional controls concerning firms' financial performance, higher pretax profit rates substantially increase wages. This result could be from profit sharing, but it could also be from better technology, better products, or better markets, all of which lead to higher shares of value-added. In contrast, labor productivity, measured by per-worker sales, does not have any significant influence on any welfare indicator. Finally, overdue loans are correlated with lower wages and longer working hours. In table 6, we use the 2005 values of the financial performance variables. In results not reported, we have also used their 2004 values to reduce their simultaneity with the dependent variables, and we have found similar results.

The results of the manager's perceptions deserve more discussion. Our results suggest that the second interpretation of the two perception variables—that is, that they capture the manager's perceptions on the roles of the union and written contracts in his or her own firm—is more relevant for our sample firms. In this case, the presence of the union is less important than the manager's perception of the role of unions because perception is likely to be formed on the effectiveness of the union. That is why the perceived role of the union relative to the management has higher prediction power than the presence of the union itself. The same explanation can be applied to written contracts, albeit to a lesser extent. To test this conjecture, we deleted the two perception variables and ran the SUR model again. The results are presented in the last three columns of table 6.

²³ This result also raises doubts as to why Guangdong firms do better in wages and working hours than firms in other provinces. Noticeable is that nonunionized firms in Guangdong perform worse in wages and working hours than their counterparts in other provinces. In nonunionized Guangdong firms, the average wage is 5.66 yuan and the average monthly working hours are 198 hours, whereas the average wage is 6.22 yuan and the average monthly working hours are 186 hours in nonunionized firms of other provinces. That is, unions' role in Guangdong is more to correct the inferior treatments workers otherwise would have to face than to raise workers' welfare above the national average.

Now the union's wage effect comes back, although its effect on working hours is still insignificant.

To summarize, we have the following conclusions. First, the union effect on pension coverage is quite robust. It is statistically significant in all regressions, and its magnitudes are economically meaningful. Second, the union effect on wages is confounded by the manager's perception of the role of the union. Regression 1 in table 6 suggests that the manager's perception is a better predictor for wages than the presence of the union. In a sense, this is an expected result because the manager's perception reflects the effectiveness of the union in his or her firm. Third, the union's effect on working hours is not robust and is not economically significant even when it is statistically significant. So, unions increase workers' hourly wages but do not shorten working hours. At the current stage, most workers are young, and their incomes are low. Therefore, they may prefer working longer hours if they get extra income.²⁴ Fourth, the results are repeated in the DPE and manufacturing subsamples, but unions also significantly shorten working hours in Guangdong, where workers work substantially longer in a month than workers in other provinces. Finally, unions are found to have positive effects on most other workers' welfare indicators.

V. Individual Contracts and Collective Contracts

The results of the analysis support the thesis that unions improve workers' welfare in China. In this section, we study two channels, individual written contracts and collective wage contracts, by which unions exert their influences. In developed economies, collective bargaining is regarded as one of the most important ways for unions to increase workers' wages (e.g., Leontief 1946; Blair and Crawford 1984). Early works (e.g., Gustman and Segal 1976) have also studied the wage gap due to written contracts in the United States. As our review in Section II showed, the ACFTU is actively promoting collective bargaining and written contracts in China. Although they are not the only channels for unions to improve workers' welfare, those two channels are likely to be the two most important in current China because other union activities (e.g., strikes) are severely limited by the government (Metcalf and Li 2005).

Among our sample firms, 29.6% allow collective wage contracts, 73% sign individual written contracts with all workers, 23% sign written contracts with some workers, and 4% do not sign written contracts with any workers. Three things are worth discussing before the regression analysis.

First, not all unionized firms have collective contracts. In fact, only 34.4% of them do, while 18.9% of nonunionized firms do. Conversely, among the firms offering collective contracts, 79.8% are unionized and

²⁴ Assessing working hours in their two sample factories, Chan and Siu (2010) claim that "only when they [workers] work for more than forty hours a week can

the rest, 20.2%, are not. Curiously, although nonunionized firms might want to offer collective contracts, the higher percentage among unionized firms seems to suggest that unions do promote collective wage contracts. Second, firms are more likely to offer individual written contracts to unionized workers than to nonunionized workers. In the survey, collective wage contracts were recorded as a binary variable of "yes" and "no" answers, but written contracts were recorded as a variable with three ordered answers: no (= 0), for some workers (= 1), and for all workers (= 2). The average score of written contracts is 1.81 among unionized firms and 1.54 among nonunionized firms. Third, it is logical to expect that firms that allow collective wage contracts would offer their workers written contracts. Except for four firms, this situation is indeed the case in the sample.

Our results are reported in table 7. In columns 1 and 2, we show the results for how the two kinds of contracts are correlated with unionization. An ordered probit model is used for individual contracts in regression 1, and a probit model is used for collective contracts in regression 2. As expected, unionization significantly increases firms' probabilities to sign individual contracts with their employees and to allow collective contracts. The next three columns of table 7 show the results of a SUR model regressing the three workers' welfare indicators on individual contracts and collective contracts. Individual contracts are highly significant for all three welfare indicators. Collective contracts show positive effects on wages and pension coverage, but their magnitudes are smaller than those of individual contracts. In addition, collective contracts do not have a significant effect on working hours. That is, collective contracts are less effective than individual contracts for providing protection to workers. This may be related to the fact that most firms that allow collective wage contracts have already offered individual written contracts, which have already provided workers reasonable protection.

That exercise has established the relationship between unionization and workers' welfare through individual and collective contracts. However, we do not know whether unions exert influences by other channels. Nor do we know whether the two kinds of contracts have influence on worker welfare independent of unions. To find out, we put unionization back into the SUR model containing both kinds of contracts as right-hand-side variables. The significant results for individual contracts are all preserved, but the two significant results for collective contracts both vanish. In contrast, unionization still has significant results for wages and pensions.

they make any money beyond the amount needed for survival, to begin to save or share it with their family members. That is why most of these workers are 'willing' to labor far longer than forty hours a week" (171).

Table 7
Collective Contracts and Written Contracts

	SUR Model Regressing Welfare Indicators (without Unionization)			SUR Model Regressing Welfare Indicators (with Unionization)		
	Written Contracts (1)	Collective Contracts (2)	Log (wage) (3)	Log (hours) (4)	Pension coverage (5)	Pension coverage (8)
Unionization	.596*** (.098)	.407*** (.104)				
Individual contracts			.069*** (.020)	-.037*** (.008)	.777*** (.091)	.624*** (.107)
Collective contracts			.038* (.022)	-.006 (.009)	.181* (.101)	.667*** (.092)
Observations	1,066	1,019	965	965	965	948
Pseudo R ²	.14	.06	.428	.261	.308	.331
			.075*** (.024)	-.004 (.010)		
			.057*** (.021)	-.035*** (.008)		
			.026 (.022)	-.007 (.009)		
			948	948		
			.442	.262		

NOTE.—The baseline controls are included in all regressions. Standard errors are in parentheses.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

The results allow us to make three conclusions. First, collective contracts only improve workers' welfare with the support of unions. In other words, collective contracts in nonunionized firms are either an ornament or are simply misreported by their managers in the survey. This result makes sense. Without the presence of the union, a collective contract, even if it is real, is at best a goodwill gesture offered by the management. For a collective contract to improve the welfare of workers as a whole, it has to be a product of serious negotiations between the management and the workers organized as a collective, for which the union serves as a vehicle. Second, individual contracts improve workers' welfare even without the presence of unions. This result is interesting. It shows that Chinese firms have begun to honor labor contracts. Judging by the literature reviewed in Section II, the court may have played a critical role in the process. Finally, unions have positive influences on wages and pension coverage independent of either collective or individual contracts.

VI. Conclusions

Trade unions in developed economies contribute to more equitable labor market outcomes in terms of narrower wage gaps, standardization of wages across firms and sectors, and lower employee turnover rates (Lee 2009). Although it has also been extensively debated whether unions in those economies cause labor market rigidities and subsequently unemployment (e.g., Cardoso and Portugal 2005), for today's China, stronger labor protection and development of contract-based labor relations are urgently needed. In this context, the government and workers are calling for a critical transition of China's unions from a functional wing of the government to a more independent institution that represents the interests of workers. For the Chinese government, economic growth is still of high priority, but with increasing costs brought about by spontaneous worker protests, it promotes the ACFTU to prevent the development of an autonomous labor movement. For most workers, the absence of independent workers' organizations leaves them no choice but to rely on the unions for protection (Zhang 2009).

Against that background, this article offers a set of empirical results showing that the presence of unions is significantly associated with workers' higher wage rates and pension coverage, as well as a wide range of other welfare indicators. In addition, we find that the presence of a union significantly increases a firm's probability of offering its workers individual and collective contracts, which, in turn, improve worker welfare. Further exploration finds that individual contracts are an independent means for improving workers' welfare. In contrast, collective contracts play a role only when the union is present.

In addition to contributing to the literature of unionism, our findings offer strong implications for union development in China. While our find-

ings support the thesis that unions improve workers' welfare, our findings also indicate ways for unions to act more effectively. Collective contracts provide workers protection in areas that affect all workers, for example, minimum wages, rules for wage adjustment, holidays, workplace safety and amenities, and more. Those areas are unions' main battlefield. Our findings, however, show that the union can be more effective if it puts more effort in promoting individual contracts. Compared with collective contracts, individual contracts are more likely to take into account individual workers' heterogeneities in education, experience, and skills, so they are more likely to improve workers' wages and other benefits. Individual contracts also provide workers better legal protection because labor violations are more likely to involve individual workers instead of all workers as a whole.

Appendix

Table A1
Determination of Unionization

Variable	Coefficient	SE
Capital intensity	.464	.393
Employment	.069***	.020
Management education	-.08	.071
Employee college	.045	.104
Migrant workers	-.225***	.064
Provincial market share	.096**	.038
Restrictions on entry	-.063	.147
Export	-.056	.049
Customer requirement	-.034	.045
Listing	.055	.108
External auditing	.09	.170
PC or PPCC membership	.307*	.162
Perception on union versus management	.746***	.172
Contracts in nearby firms	.190**	.096
CSR awareness	.109	.103
Charity donation	-.117	.175
Pretax profit rate	.005	.918
Per-worker sales	-.137	.119
Loan default	.425*	.243
Constant	-.299	.565
Ownership dummies	Yes	
Industry dummies	Yes	
City dummies	Yes	
Observations	534	
Pseudo R^2	.2872	

NOTE.—The dependent variable is the unionization dummy, and the probit model is used in the estimation.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

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