Pie-growing or Pie-sharing?

The Effects of China's Democratic Management on Compensation and Firms' Performance

Liwen Chen

Faculty of Economics and Management,

East China Normal University

Zhongxing Su

School of Labor and Human Resource Management

Renmin University of China

Guanghua Wang

Department of Economics,

Clemson University

Abstract

Using data from "China Employer-Employee Matched Survey" (2013), the authors initiate an empirical examination on the effect of China's democratic management (DM) on wages, benefits and firms' performance. The authors find that workers in DM establishments have higher wages and are eligible to greater varieties of non-pecuniary benefits than workers in non-DM firms, which remain robust after accounting for the endogenous presence of DM. The wage effects are more prominent in firms where union voice mechanism is absent. At the establishment-level, the presence of DM is associated with higher value-added per worker, higher labor cost per worker and lower profit per worker. These suggest that DM institutions in China not only increase the size of joint-gains, but also let employees have a "voice" over the distribution of economic gains. The presence of DM is, however, associated with a negative profit effect.

Facing a decline of unions in both the US and Western Europe, research has mushroomed investigating the effects of non-union workplace participation on workers' compensation and firms' performance. While the findings are extensive and insightful, we know little about these effects in the socialist market economy, a deficiency that is particularly pronounced in China. The present paper seeks to remedy this omission, focusing on these effects of democratic management (DM) in China.

DM in China refers to a set of officially sanctioned institutions at workplaces through which workers practice the rights of democratic decision making, democratic participation and democratic supervision on issues related to both workers' welfare and firms' operation and management. In this study, we focus on three DM institutions: The Staff and Workers' Representative Congresses (*SWRCs*, *Zhigong Daibiao Dahui* in Chinese), the "*Disclosure of Factory's Affairs*" (*Changwu Gongkai* in Chinese) and the Workers' Representation on Boards of Directors and Supervisors (*WRBSD, Zhigong Dongshi Jianshi* in Chinese). Once being a set of union-based institutions serving for the ideology of "workers being the masters of the state and of the workplaces", DM's political value outweighed its economic value in the planned economy and in the first three decades of economic reform. With its power significantly curtailed in public sectors and largely absent in private sectors then, DM was long viewed as a rubber stamp. Things have changed over the past decade. The state has legislatively promoted DM to enterprises of all types, including the private sectors and non-union firms. Viewed as important institutions that contribute to "co-construction and mutual benefit of labor and management" and "harmonious labor relations", DM institutions have been granted greater power at workplaces, at least stated on paper. It is then intriguing to investigate the meaning of this process to workers' compensation and

firms' performance: does DM effectively perform the dual role of "pie-growing" and "pie sharing", or does it remain as a set of symbolic and ineffective institutions?

Moreover, as DM is promoted and organized mainly by the All-China Federation of Trade Unions (ACFTU) and its affiliations, it is not a part of union-avoidance strategy as the counterpart workplace participation institutions in the US and Western Europe, but it could be a witness of firms' compliance with the law and a way of fulfilling the firms' "political tasks". In this case, are the economic effects of DM enhanced with the presence of firm-level unions, or does DM act as a substitute for unions? In non-unionized firms, does DM exert any effects on employees' compensation and firms' performance? Using employer-employee matched data, the present paper seeks to answer these questions by exploring the effects of DM on wages, fringe benefits and firms' performance.

We contribute to the existing literature in three ways. First, we provide the first empirical evidence on wage and productivity effects of the officially-sanctioned non-union employee participation mechanism in China. Our finding that DM generally assumes both "pie-growing" and "pie-sharing" roles at workplaces differs sharply from the prevailing scholarly depiction of DM being a rubber stamp with powers only stated on paper. Our findings reveal the economic logic of the states' recent attempts of promoting DM to enterprises of all types. Second, we compare, for the first time, the effects of union and non-union voice mechanisms at workplaces in China, pointing out that the different effects of the two mechanisms could be attribute to the different roles that they play in China's industrial relation system. This finding contributes to the literature on union versus non-union employee participation. Third, our empirical results suggest that most of the union wage premium is ascribed to the presence of DM at workplaces, which has been ignored

in previous research on union wage effects in China. The findings suggest that DM is a mechanism of no less importance than trade unions. Future research needs to reconsider the correlation between union and other voice mechanisms and include a variety of alternative firm-level voice mechanisms so as to avoid the effects of these mechanisms being ascribed to unions.

Relevant Literature

In this section, we provide a brief review of the literature that is closely related to our present inquiry. We start with a review of the extensive findings on the wage and productivity effects of non-union workplace participation in the developed world. Then, we review findings comparing these effects of union and non-union workplace participation mechanisms. Finally, we summarize the related literature on workplace participation in the context of China.

Non-Union Employee Participation and Wages

Wage effects of non-union employee participation mainly come from the channel of "collective voice" (Freeman and Lazear 1995; Kaufman and Levine 2000). Most of empirical evidence in this realm focuses on works councils in the Western Europe (FitzRoy and Kraft 1985; Addison, Kraft and Wagner 1993; Addison, Schnabel and Wagner 2001; Hübler and Jirjahn 2003; Gürtzgen 2009; Addison, Teixeira and Zwick 2010; Grund and Schmitt 2013). Early research investigates the question based on establishment-level data. Addison et al. (1993) and Addison et al. (2001) find that the establishments with works councils have higher average wages than those without works councils across industries. Moreover, Hübler and Jirjahn (2003) find that such establishments exhibit a smaller wage spread compared to those without wors councils. Moreover, Hübler and Jirjahn (2003)

provide evidence that firms with a works council exhibit a smaller wage spread compared to those without one.

Recent studies go beyond establishment-level analysis and take advantage of employer-employee linked data sets, alleviating the concern of the omitted variable bias due to employee heterogeneity. For example, Gürtzgen (2009) uses German linked employer-employee data from the Establishment Panel of Institute for Employment Research (LIAB); based on the pooled OLS estimations, he finds that wages are higher in firms with a works council. Addison et al. (2010), again based on the LIAB, accounting for the issues of selection and unobserved heterogeneity, find a positive relationship between individual wages and the presence of a works council. They also show that the presence of works councils narrows the wage gap between the least educated and the best-educated workers, and the wage effects of works council benefit women in particular. Summing up, research on the effects of works councils almost reach a consensus that the presence of works councils is associated with higher wages and more equalized wage distributions. However, evidence is sparse on the wage effects of non-union employee participation mechanisms at workplaces in China.

Non-Union Employee Participation and Firms' Productivity and Profitability

Kaufman and Levine (2000) provide a theoretical framework, in which they proposed channels that may determine the effects of non-union employee participation on firms' productivity and profitability. In their theoretical framework, non-union employee participation is viewed as a factor of input. They argue that non-union employee participation could contribute to higher productivity by tackling workplace problems such as imperfect information, bounded rationality, workplace public goods and the supervisors'

opportunisms. At the same time, non-union employee participation also increases the direct costs, such as compensation for the time spent on the participation, as well as the indirect costs, such as slower decision processes.

There are a few papers empirically testing the effects of different forms of non-union employee participation on firms' productivity. For example, Doucouliagos (1995) uses meta-analysis and documents that participation through co-determination hurts firms' productivity, while participation through profit sharing, workers' ownership, and participation in the decision-making process increase productivity. Based on longitudinal data of 26 steel plants in the US, Ichniowski, Shaw, and Prennushi (1997) find a positive relation between firms' productivity and workers' participation, such as teamwork, profit sharing, and job enlargement.

The majority of the empirical studies focus on the effect of works councils on productivity. However, affected by the availability of data, research varies in terms of their productivity measurements. The reported effects of works councils on firms' productivity are mixed in terms of direction, significance and magnitudes.

Some studies document the adverse effects of works councils on firms' productivity. FitzRoy and Kraft (1987) show that the presence of works councils is negatively related to firms' productivity. Based on the pooled data on firms in the metal working industry in 1977 and 1979, FitzRoy and Kraft (1990) documents that the presence of works council in firms with high union density is negatively associated with the proportion of sales consisting of new products. Using data from 112 West German manufacturing companies for the year 1975 and 1983, FitzRoy and Kraft (1993) estimate the productivity effects of workplace codetermination based on translog production functions. They document that

the 1976 codetermination law had a consistently negative effect on firms' productivity and profitability but no significant effect on labor cost. Addison et al. (1993) find that the effects of works councils in the investment, measured by the ratio between capital investment and firms' capital stock, is significantly negative.

However, other literature reports that the presence of works councils is positively associated with firms' productivity. Based on the Hanover Firm Panel (1994), Addison et, al. (2001) show that the presence of works council is associated with higher labor productivity (measured by the value added per worker) for the overall sample but not for establishments with 21-100 employees. Frick and Möller (2003) find that plants with works councils have sharply higher productivity (measured by the log value added) of 25% in West Germany and 30% in East Germany. Hübler and Jirjahn (2003) suggest that the positive effects of works councils on firms' productivity (measured by value added per worker) is statistically significant only in plants covered by collective agreements. Based on the panel data, FitzRoy and Kraft (2005) document the productivity-augmenting effects of German's parity, board-level codetermination.

There's also research suggesting a weak relationship between the non-union workplace participation on firms' productivity. Based on the data from the Hanover Firm Panel (1994), Addison et al. (1996) examine the effects of works councils on firms' product innovation (measured by a dummy that equals one if a new product was introduced in 1993) and firms' process innovation (measured by a dummy that equals one if a new production process was introduced in 1993). However, their findings show that works councils' impact is statistically insignificant on product innovation. Schank, Schnabel, and Wagner (2004) do not find any evidence showing that significant differences in

productivity (measured by log sales) existing between establishments with and without works councils. Addison, Bellman and Kölling (2004) also present no significant productivity effects associated with the presence of works councils. Some research based on British enterprises also suggests that non-union employee participation does not contribute to the improvement in productivity (Gollan, 2001; Fernie and Metcalf 1995; Terry, 1999).

Regarding the effect of non-union workplace participation on firms' profitability, most literature has reached a consensus that participation through codetermination have a negative effect on firms' profitability. FitzRoy and Kraft (1985) use the ratio of cash flow to capital as a measurement of firms' profitability and report a negative effect associated with the presence of works council. This adverse effect of works council is then attributed to slower decision making rather than to rent seeking, given no significant wage effects are observed. Addison et al. (1993) find that the works councils have an insignificant negative effect on firms' profitability (the ratio between net profit and fixed capital). Based on a self-reported categorical indicator of profit, Addison et al. (1996) and Addison et, al. (2001) report that profit is systematically lower with the presence of works councils. However, the underlying mechanism is still unclear.

The Effects of Unions vs. Non-Union Employee Participation

The effects of union vs. non-union employee participation are usually analyzed separately in the participation literature (Addison 2005; Pyman, Cooper, Teicher and Holland 2006), and sometimes one is used as a control variable while examining the effects of the other. To the best of our knowledge, current literature compares the efficacies of

union and non-union voice mechanisms from two perspectives: their effects on wages and firms' performance, and their effects on workplace managerial performance.

The effects of union and non-union voice mechanisms on wages and productivity are mixed in literature, the findings in current literature are mixed with respect to the directions and significance of the effects. FitzRoy and Kraft (1985) examine the effects of works council presence and union density on firms' profitability (measured by the ratio of cash flow to capital) and firm-level average hourly wages in the metal industry in the 1970s. They show that the presence of works councils is associated with negative and significant effects in profitability and negative but insignificant effects on wages, while union density is associated with positive and significant effects on both profitability and wages. Based on the same data set, FitzRoy and Kraft (1990) investigate the interaction effects of unions and works councils on firms' innovative practice (measured by the proportion of sales consisting of new products introduced in the last five years). They document that the interaction of works councils and unions has a significant negative effect on firms' innovative practice. Schnabel and Wagner (1994) turn to manufactory industry and examines the effects of unions and works councils on firms' R & D expenditure. Their findings show that both works councils and unions have adverse effects on firms' R & D expenditures, but the effects of works councils are marginally significant. Cooke (1994) examines the productivity effects of workers' participation programs and profit-sharing programs in union versus non-union firms for a small sample of manufacturing firms in Michigan. The findings suggest that workers' participation programs contribute to higher productivities in union sectors than in non-union sectors, while the profit-sharing programs contribute higher productivity in non-union sectors. Addison (2005) provides a survey of

literature comparing the effects of unions, works councils and various High Performance Working Practices (HPWP) with employee involvement, suggesting that the union's productivity effects are generally small, while the interactions between HPWP and works councils yield substantial productivity gains.

There is also literature comparing the effects of union and non-union voice mechanisms on managerial responsiveness. Using data from the employer-employee British Workplace Employee Relations Survey, Bryson (2004) shows that the perceived managerial responsiveness is better among employees with non-union voices than they are among employees with union voices. Bryson et al. (2006) show that firms' productivities are positively associated with managerial responsiveness. Following this, Pyman et al. (2006) examine the effects of direct-voice mechanisms, unions and non-union representation mechanisms on perceived managerial responsiveness, perceived job control and influence over job rewards in Australia, using data from the Australian Worker Representation and Participation Survey (AWRPS, 2004). They document that the efficacy of employee-voice mechanisms is the highest at workplaces with a mixture of multiple voice mechanisms.

To sum up, although recently some scholars have noticed the importance of investigating the relative efficacies of various types of voice mechanisms at workplaces, there is a dearth of literature comparing the effectiveness of union and non-union voice mechanisms, especially in the context of China.

Democratic Management in China

Non-union employee participation in China has a long history. Hoffmann (1977) documents details about China's famous Angang Constitution, an institutional mechanism

for workers' participation in plant management during the 1960s. Most of the studies about DM are qualitative in nature. They analyze DM from historical, political and sociological perspectives and the focus has been more on the development, legitimacy, rather than on the economic outcomes of DM (Feng 2001; Taylor, Chang and Li 2003; Cheng 2006; Philion 2007; Xie and He 2007; Shi 2010; Yu 2011; Danford and Zhao 2012; Feng 2012; Liu 2013; Estlund 2014). The literature reaches a rough consensus that DM at workplaces is feeble and ineffectual in terms of protecting workers' interests, no more than symbolic institutions (Zhu and Chan 2005; Estlund 2014). Only a few studies conduct quantitative empirical analysis on DM, most of which focusing on the SWRC, an essential part of DM. Chen and Chan (2004) find that workers' perceived effectiveness of SWRC is associated with better practice on occupational health and safety (OSH). Based on a nationally representative cross-sectional data collected by ACFTU in 1997, Zhu and Chan (2005) document the history, characteristics, functions and powers of the SWRCs, and examine factors that influence workers' evaluation on SWRCs. They find that workers in firms with better union performance, better implementation of OSH, higher wages tend to give SWRCs higher ratings. Huang et al (2016) report a positive relationship between employees' perceived efficacy of DM and wider organizational commitment. However, there has been no empirical work examining the effects of DM on wages, firms' productivity and profitability in China.

Institutional Background

In this section, we provide the institutional background on the history, functions and power of DM and the relationship between DM and trade unions.

A brief history of DM

DM originally gains its legitimacy from the CPC leadership and socialistic ideology. It was once a set of institutions designed and enforced by the central government of China to fulfill the ideological premise that "workers being the masters of the state and of the workplaces" and to serve the function of moderating tensions between management and labor (Zhu and Chan 2005).

During the period of the centrally planned economy, DM at workplaces featured in two institutions: Factory Management Committee (Gong Chang Guan Li Wei Yuan Hui)[1] and Staff and Workers' Assembly (Zhi Gong Dai Biao HuiYi) [2]. However, these two institutions were built upon the notion of "ownership by the whole people". "Ownership by the whole people" means that each single firm was owned by the whole people nation-wide, rather than by its own staff and workers. Only the government, representing the interests of the whole people, had the legitimate right to regulate and operate these firms. Moreover, in the planned economy, the goal of enterprises was fulfilling the production quotas determined by the government, rather than maximizing profit, and the role of workers was helping the management fulfilling the quotas. Therefore, labor and management formed pure production relations, rather than employment relations of real sense. Ideologically, there is no conflict interests between labor and management. Under these circumstances, the two DM institutions had no legitimate ground at the firm-level to

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[1] The Factory Management Committee comprised the factory director as the chairman, the trade union leader, the deputy factory directors, the chief technicians and some workers' representatives. The committee had the full authority over enterprise management. (Zhang 1992: 140)

[2] Founded in 1949, the Staff and Workers' Assembly (Z*hi Gong Dai Biao HuiYi*), was the less-institutionalized precursor of China's SWRC with very limited power vis-à-vis the management (Zhu and Chan 2005). The main function of the employee representative assembly was to review and discuss reports given by the Factory Management Committee, and to make some suggestions on production.

counteract the government decisions regarding the operation of firms and distribution of joint-gains. The economic power of the two DM institutions were greatly curtailed, and gradually, the two institutions lost ground at workplaces. The DM system was destroyed during the Cultural Revolution (Wang, Wang, Xu and Shao 1999:1; Zhang 1992: 141).

Along with the initiative of economic reform in the 1980s, the reform on enterprise ownership was launched. During the reform, the state-owned enterprises (SOEs) were granted the authority to manage their business and to hire workers. When employed, workers were subordinated to the management at workplaces, which went against the ideology of "workers being the master" and brought about catalyst for the development of DM at workplaces. In the early 1980s, laws and regulations such as the Provisional Regulation on Workers' Congresses in State-Owned Enterprises (1981), the Constitution (1982), and the Regulation on Workers' Congresses in Enterprises Owned by the Whole People (1986) stated that SOEs should practice DM through the system of SWRC.[3] These legislatively confirmed workers' democratic right and reinstate the ideology of workers being the master of workplaces. Since then, SWRCs had been set up as one of the three fundamental components of the management system in SOEs, with the other two being collective leadership by the Party committee and administrative command by the factory director (Zhang 1992: 142). The SWRCs are institutionalized bodies for representative communication between employees and their employer, which is in particular, "superficially analogous to the German works council system and the concept of 'co-determination' that it embodies" (Estlund 2014). The main functions of SWRCs at that time include: (1) to discuss the director's annual work report and make relevant solutions;

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[3] The Law of the People's Republic of China on Industrial Enterprises Owned by the Whole People (1986) stated that "the enterprise shall, through the SWRCs and other forms, practice democratic management" (Article 10).

(2) to examine the factory's annual and long-term plans; (3) to discuss and pass the factory's annual financial report, the uses of the factory's retained profits and the allocation of housing; (4) to discuss and pass the factory's specific rules and regulations; (5) to discuss and approve the proposals raised by the staff and workers, and to supervise the relevant departments to implement them; (6) to appraise the directors and managers, including suggesting reward, punishment, appointments, and removals. The SWRCs were then extended to the collective enterprises in the early 1990s. SWRCs in collective enterprises were given greater discretionary power than those in SOEs, at least on paper.[4] From the 1990s to the 2000s, more legislative efforts were undertaken to improve the effectiveness of SWRCs.[5]

The year 1993 witnessed a critical stage of the enterprise reform, focusing on establishing modern enterprise system. As another indispensable part of China's DM, the practice of WRBSD started. This institution was formally stipulated by the Company Law of China (1993). In the wake of the Company Law, the institution of WRBSD was written in the local regulations on DM in around 20 provinces, municipalities and autonomous regions. The revised Company Law of the People's Republic of China (2005) stipulates that, for all companies, the supervisory board shall be composed of representatives of the shareholders and an appropriate proportion of the staff and workers of the company, among which, the proportion of the staff and workers shall not be less than one-third and the exact proportion shall be stipulated in the articles of association of the company. The

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[4] The City and Township Collective Enterprise Regulation (1992) stated that the staff and workers' (representative) congress is the "power organ of a collective enterprise" (Article 9); the SWRCs in collective enterprises were also entitled the right to elect or dismiss factory directors, vice factory directors and other management staff (Articles 9 and 28.2). However, in SOEs, the SWRCs only had the right to "suggesting appointments and removals of directors and managers".
[5] Laws and regulations include the Trade Union Law of the People's Republic of China (1992, amended in 2001), the Company Law of the People's Republic of China (1993, amended in 1999, 2004 and 2005), the Labor Law of the People's Republic of China (1994) , as well as the Labor Contract Law of the People's Republic of China (2007).

representatives of the staff and workers in the supervisory board shall be democratically elected by the staff and workers of the company through the SWRC, workers' assembly or other forms. (Articles 52, 71, 118). With respect to the representatives on the board of directors, the revised company law states that the board of directors in wholly state-owned company shall include representatives of the staff and workers (Article 68.1), who are elected by the SWRC. A joint stock limited company, a limited liability company invested in and established by two or more state-owned enterprises shall include democratically-elected representatives of the staff and workers on the board of directors (Articles 45, 109). The WRBSD represent staff and workers' rights and interests in the boards of directors and supervisors. Possessing equal power as other directors and supervisors, employee directors and employee supervisors exercise the supervisory function within the management system of a company.

The "*Disclosure of Factory's Affairs*" aims at protecting employees' "right to know" and fostering communication and information sharing between employees and the management. It was once a requirement implicitly stated in the laws and regulations for the SWRC, which ensured staff and workers the right to be informed. In 1998, the "*Disclosure of Factory's Affairs*" was formalized as a separate DM institution that keeps staff and workers informed of issues regarding the important strategic decisions on production and management, issues related to staff and workers' interests, as well as issues related to the conduct of the top management staff.

Even though the three DM institutions have been set up at workplaces by the end of 1990s, DM's power was greatly curtailed in public sectors and was absent in the private sectors. Its political value outweighed its economic value (Zhu and Chan 2005; Philion

2007). Things have changed as the state saw the importance of harmonious labor relations on its 'Made in China 2025' initiatives. During the process of "building harmonious labor relations in the new epoch", DM is viewed as a set of institutions with dual roles of "pie growing" and "pie sharing", which is vital to "promoting the co-construction and mutual-benefits of workers and enterprises".[6] Over the past decades, the changing economic and social context in China has triggered a modest revival of DM. The DM was extended legislatively to enterprises of all types, including private sectors, since the enforcement of Company Law in 2005. Following this, regional regulations were enacted and issued in many provinces and municipalities. A notable change is that DM has now been extended to enterprises with no union branches. For instance, according to the Regulations on Staff and Workers' Representative Congress in Zhejiang Province (2010), "in enterprises with no firm-level union branches, SWRC shall be organized with the help of trade union at the higher level". The issue of Provisions on the Democratic Management of Enterprises (2012) [7] legislatively regulated three DM institutions: SWRC, "*Disclosure of Factory's Affairs*" and the WRBSD.

Functions and Power of DM at Current Workplaces

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[6] In September 2018, Qiu Xiaoping, the vice minister of the Ministry of Human Resources and Social Security made a speech at a meeting, urging the implementation of DM in private sectors. Qiu stated that the purpose of this action was to "promote the co-construction and mutual-benefits of workers and enterprises by deepening democratic management …, building harmonious labor relations in the new epoch". Source: Ministry of Human Resources and Social Security. http://www.mohrss.gov.cn/SYrlzyhshbzb/dongtaixinwen/buneiyaowen/201809/t20180913_301045.html

[7] The provision was issued by six government departments, including the Central Commission for Discipline Inspection of the CPC, the Organization Department of the CPC Central Committee, the State-Owned Assets Supervision and Administration Commission of the State Council, the Ministry of Supervision, the All-China Federation of Trade Unions and the All-China Federation of Industry and Commerce.

The functions and power of SWRCs and "*Disclosure of Factory's Affairs*" at current workplaces is stated by the *Provisions on the Democratic Management of Enterprises* (2012) (2012 DM provisions here after).

The 2012 DM provisions grant SWRCs even greater functions and powers compared to those stipulated in 1986. These functions include: (1) to be informed of reports made by the major directors or person in charge of the enterprises regarding the enterprise's development plans, annual production and business operation, enterprise reform, the conclusion and fulfillment of the labor contracts and collective contracts, safety conditions, as well as the payment of social insurance premiums and housing provident fund, and to put forward opinions and suggestions; deliberating the plans on issues regarding labor remuneration, work hours, rest and vacation, labor safety and health, insurance welfare, training for employees, labor discipline, labor quota management and those directly involving the vital interests of laborers, and to put forward opinions and suggestions; (2) to deliberate and adopting collective contract drafts, plans for the use of employee welfare funds collected in accordance with the relevant provisions of the state, plans for adjusting the payment proportion and time for the housing provident fund and social insurance premiums; (3) to elect or recall the employees' directors or employees' supervisors, elect the employees' representatives for creditors' meetings and creditors' committees of enterprises entering bankruptcy proceedings pursuant to law, and recommend or elect the enterprise's business managers upon authorization; (4) to examine and supervise the enterprise's implementation of labor laws and regulations and labor bylaws, deliberate the enterprise's leaders in a democratic manner, and propose suggestions for awards and punishments.

In terms of the "*Disclosure of Factory's Affairs*", the 2012 DM provisions require enterprises of all types to establish a system of disclosing managerial information in the enterprises. Enterprises are obliged to disclose information on issues such as the general situation of the enterprise operation and management, recruitment and implementation of employment contracts, the signing and implementation of collective contracts, as well as details on rewards or punishments of employees, plans of mass lay-offs, details regarding the social insurance payments, etc. SWRC is one of the channels through which the enterprise discloses related information to the staff and workers. Other channels including factory information disclosure meetings (*Chang Qing Fa Bu Hui* in Chinese), factory information disclosure posts or displays, joint meetings of the factory-level Party Committee, administrative management and trade union members, as well as channels like factory newspaper, mailbox for suggestions and complaints, "rationalized proposals" (*He Li Hua Jian Yi* in Chinese), factory directors' reception day, and workers' forums, etc.

The power and functions of WRBSD is stipulated in the revised Company Law in 2013. It is stated that the board of directors shall include employee representatives for limited liability company established by 2 or more SOEs or other state-owned investors (Article 44). The board of supervisors shall include the employee representatives (Article 51). The employee representatives shall be elected by the employees of the company through the SWRC or by other means. Employee representatives on the board of directors and supervisors practice the right of democratic decisions and supervision.

The Relationship between DM and Firm-Level Trade Unions

Workplace democracy in China is characterized by strong legal and state interventions (Chen, Su and Zeng 2016). This feature makes the relationship between DM and the trade union different from those in the US and the German models.

First, DM and trade unions are closely intertwined at workplaces. In western countries, trade unions represent the interests of union members independently. However, in China, the independent trade unions are banned, and firm-level trade unions are all affiliations of the All-China Federation of Trade Unions (ACFTU) (Liu 2010). Different from the non-union employee participation institutions such as works councils, DM in China does not rest on the foundation of independent trade unions. Rather, DM institutions are organized and promoted mainly by the ACFTU and its affiliations at all levels. The firm-level trade unions are responsible of "involving workers in the democratic process of decision making, management and supervision of the enterprise" and carrying out the daily functions of the SWRC in between its regular meetings. (Feng 2012, P195). Therefore, the presence of DM institutions is highly correlated with the presence of firm-level union branches, and the effectiveness of DM institutions would be greatly affected by the presence and effectiveness of firm-level union branches (Feng 2012).

Second, the presence of non-union employee participation mechanisms is often portrayed either as part of firms' union avoidance strategy (Pyman et al. 2006; Millward et al. 1992: 365; Machin and Wood, 2005) or as part of "social partnership" at workplaces (Budd 2004). However, in China, the presence of DM is not a part of union-avoidance strategy but could be a signal of firms' compliance with the law (Cooke 2014, Huang et al, 2016).

Third, both the DM and trade unions may affect the compensation determination at workplaces, but through different channels. Trade unions may influence the wage determination through collective consultation.[8] However, without the legally recognized right to strike, the collective contracts at China's workplaces are not negotiated through collective bargaining of real sense (Clarke et al. 2004; Clarke 2005). The DM institutions could influence the setting of wages and benefits at workplaces from three perspectives: (1) The SWRCs could influence wages and benefits via the rights of being informed of and providing suggestions on firms' major employment decisions such as the signing and implementation of labor contracts and collective contracts, the workplace safety conditions, as well as the enterprise's payment of social insurance premiums and housing provident fund; SWRC could also influence the wage setting with the functions of examining, approving or vetoing to the drafts of collective contracts, plans on the use of employee benefit funds, and plans for adjusting the payment and schedule for the housing fund and other social insurance premiums. (2) The management is obliged to disclose information regarding the signing and implementation of collective contracts, as well as details on rewards or punishments of employees through the "*Disclosure of Factory's Affairs*". (3) The WRBSD has the right to convening conferences to discuss events or regulations closely related to workers' interests. The workers' representatives could also supervise the implementation of collective contracts and labor contracts, making sure that workers' interests are legally protected. It is also worthwhile to mention that, given the highly correlation of union and DM institutions at workplaces, the wage effects associated with the union presence may also be attributed to the presence of DM.

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[8] The 1992 Trade Union Law specifies that "trade unions may, on behalf of the workers and staff members, sign collective contracts with the management of enterprises or institutions."

Fourth, both considered as institutions representing workers' interests, DM and trade unions act very different roles at workplaces. Firm-level trade union acts as the "bridge and connection" between the Party and workers[9], the priority goal of which is maintaining peaceful employment relations rather than maximizing workers' share of the joint-economic gains. Different from trade unions in western countries, firm-level trade unions in China do not actively engage in rent-seeking activities, but rather they are responsible of mediating the labor and the management relations. To this end, firm-level trade unions communicate workers' needs to the management on one hand, and on the other hand, provide workers with incentives to understand and follow the managerial decisions. The presence of DM, however, prevents trade unions from over-compromising via practicing the right of democratic decision, democratic participation and democratic supervision.

Data and Summary Statistics

Data and Sample Construction

The data used in this study are taken from the "China Employer-Employee Matched Survey" (2013), which is one of the long-term research projects supported by the "985 Project" special funds of Renmin University of China. The 2013 wave of this survey covered 441 firms and 4532 workers among 12 major cities[10] in mainland China. The firm sample is randomly selected through stratified sampling, with the sampling frame

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[9]The general principle of the "Constitution of the All-China Federation of Trade Unions" states that "the Chinese trade unions are mass organizations of the Chinese working class under the leadership of the Communist Party of China and formed by the workers of their own free will. They serve as a bridge and link between the Party and workers and an important social pillar of state power and represent the interests of the trade union members and workers."

[10] The 12 cities include Beijing (East China), Jinan (Shandong Province, East China), Guangzhou (Guangdong Province, South China) , Suzhou (Jiangsu Province, Southeast China), Fuzhou (Fujian Province, Southeast China), Xiangyang (Hubei Province, Middle China), Zhengzhou (Henan Province, Middle China), Chengdu (Sichuan Province, Southwest China), Changchun (Jilin Province, Northeast China), Qiqiha'er (Heilongjiang Province, Northeast China), Taiyuan (Shanxi Province, Northwest China) and Xianyang (Shaanxi Province, Northwest China) , which are representative of China's diverse geographic and urban composition

constructed using the business directory based on the 2008 National Economics Census. In each of the sampled establishment, employee samples are randomly selected via population proportion sampling.

Using the matched employer-employee data set has its advantages. With the information on individual workers' characteristics and details concerning the establishments that they are employed in, we could control for the firm and employee heterogeneities when investigating DM's wage and benefit effects. To deal with the unobserved employee characteristics, we could also control for the firm-level workers' (mean) characteristics.

We construct the sample for individual workers by selecting the non-dispatched workers[11] aged 18-65. These workers are full-time employed (worked for 30-100 hours per week) in 2012. We keep respondents with valid information on their demographic, human capital characteristics and wage information, on establishment-level DM institutions and practices and other individual characteristics. The final sample contains 3559 individuals. Our sample for the establishments contains 332 establishments with valid performance indicators such as total labor cost, annual value-added, and annual profit etc. Table 1 presents the observation losses due to each sample inclusion criterion.

[Table 1 Here]

Questions c3_1_1-c3_1_3 in the employers' survey ask whether the establishment has DM institutions such as SWRC, *Disclosure of Factory's Affairs*, and WRBSD, respectively. We construct a dummy variable indicating whether an establishment is an DM establishment or not. We divide the sampled establishments into two groups: one with

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[11] Non-dispatched workers sign contracts with firms that they are worked for, rather than with some dispatch agencies.

at least one of the three DM institutions (DM establishments, hereafter) and the other without any of the three DM institutions (non-DM establishments, hereafter).

Table 2 outlines the distribution of DM institutions among the establishments in our sample. DM institutions have wider coverage in establishments with establishment-level union branches, and in public owned enterprises. In our sample, among establishments with no union branches, around 36% of them adopt at least one DM institutions.

[Table 2 Here]

Summary Statistics

Table 3 provides summary statistics for individual workers' (mean) characteristics for the entire sample and by establishments' DM status. Around 42% of the employees in the sample are working in DM establishments. Comparing workers in DM and non-DM establishments, we find that they are not significantly different from each other in terms of the demographic characteristics such as age, marital status, and Hukou status, etc. However, workers in DM establishments are slightly more educated than workers in non-DM establishments (the average years of schooling being 12.96 and 12.70, respectively). Workers from the DM establishments are more likely to be union members and members of China Communist Party (CCP) than their counterparts in non-DM establishments (around 31% of sampled workers from the DM establishments are union members and only 11% of sampled workers from the non-DM establishments are union members; around 16% sampled workers in DM establishments are CCP members while only 9% workers in non-DM establishments are CCP members). Many sampled workers in DM establishments are from the public owned enterprises (around 36%) while a smaller portion of workers in non-DM establishments are from the public-owned enterprises (only 15%). Moreover, sampled workers in DM establishments are more likely to be management staffs, and

sampled workers in non-DM establishments are more likely to be un-skilled blue-collar workers. These imply that workers in DM and non-DM establishments are systematically different in terms of their work-related characteristics, and we need to control for these to ensure the wage effects of DM institutions, if any, do not come from other sources, such as union wage premiums, CCP member wage premiums, or state-sector wage premiums etc.

Table 3 also shows that workers in DM establishments work for less hours per week than workers in non-DM establishments, the average weekly working hours being 46.35 and 47.57, respectively. Workers in DM establishments earn higher hourly wages on average, compared to those in non-DM establishments, the average hourly wages[12] being RMB 13.07 Yuan ($2.07 USD) and RMB 12.6 Yuan ($1.87 USD), respectively. In addition, workers in DM establishments also have greater accessibility to non-pecuniary benefits than workers in non-DM establishments.

[Table 3 Here]

Table 4 provides summary statistics for establishments in our sample. The union coverage is higher in DM establishments. 71% of DM establishments have establishment-level union branches while only 28% of non-DM establishments have union branches. The share of union members is also higher in DM establishments. These patterns indicate that the presence of DM institutions is highly correlated with the presence of union branches, and we need to separate the union effects from the DM effects in our analysis. In addition, DM establishments also have longer history and greater size than non-DM establishments.

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[12] In the survey, a workers' monthly wage is collected. The hourly wage is calculated using the monthly wages divided by workers' monthly working hours. Our major findings do not change if the monthly wages are used instead.

Other than these, DM establishments do not differ significantly from non-DM establishments.

With respect to the ownership structures, around 26% of the establishments in our sample are from the public-owned enterprises (15% from SOEs and 10% from collectively owned enterprises); around 70% of the sampled establishments are from the domestic privately-owned enterprises, the proportion of which is quite close to those in Yao and Zhong (2013) (68.7% out of 1236 firms) and Ge (2014) (65.4% out of 1.3 million firms). Around 34% of DM establishments are from public-owned enterprises, the proportion of which is only 13% for non-DM establishments.

In terms of the indicators for productivity and rent distribution, descriptive statistics show that establishments with DM institutions, on average, have higher annual revenue, higher value added in 2012, greater amount of total wage cost and shorter average weekly working hours. The two groups of establishments are not significantly different in terms of the average annual profit in 2012. These statistics, at first glance, imply that DM establishments may have higher productivities that lead to larger "pies" compared to non-DM establishments. With respect to "cutting the pie", it seems that workers in DM establishments share larger portion of the "pie" compared to workers in non-DM establishments. We will further explore this in the following section.

[Table 4 Here]

Empirical Strategy

With respect to the wage effects of DM institutions, we start from the standard Mincerian earnings function in which the dependent variable is individual's natural log of hourly wages. We use the following methods to deal with the potential heterogeneities and endogeneities in our empirical estimation: (1) to account for the employee and firms'

heterogeneities, we control for individual workers' characteristics [13] and firms' characteristics[14]. (2) Considering the cross-sectional nature of our data set, the estimation may still suffer from omitted variable bias if we only control for individual workers' characteristics and establishment characteristics. That is, not all individual workers' heterogeneities are observed and controlled for. If these un-observed individual heterogeneities are correlated with workers' productivity, the estimated wage effects from the OLS regression will be biased. One way to tackle this issue is to find a proper instrumental variable for the presence of DM institutions and union branches. Yet it is difficult to find a credible instrumental variable at the firm level that affects the adoption of DM institutions but not directly affect firms' productivity and workers' wages and benefits. We exploit the advantages of our employer-employee matched data to address this issue. Specifically, based on the assumption that workers in the same establishment share some common features, we include establishment-level (mean) workers' characteristics[15] to the model. (3) It is also likely that the presence of DM institutions is endogenous, to deal with this, we add to the model the predicted propensity score (the estimated probability) of an establishment having DM institutions[16]. For the same reason, the predicted propensity score of an establishment having union branch is also included in the model. Similar strategies are used when analyzing the effects of DM institutions on workers' accessibility to fringe benefits.

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[13] Individual workers' characteristics include gender, workers' age and its quadratic form, years of schooling, a dummy for China Communist Party membership, a dummy for union membership, worker type.

[14] Firms' characteristics include establishment size and its quadratic form, establishment age, the types of firm's ownership structure, as well as industry dummies and regional dummies etc.

[15] These include variables such as share of employees with at least college education, share of female workers, share of employees above 50, share of management staffs, share of temporary or dispatched workers, etc.

[16] The propensity score is the conditional probability that a firm adopts the DM institutions (or establishes trade union chanpters) given the firms' observed covariates. The goal of the propensity scoring is to mimic the situations in randomized controlled trials (RCTs) by balancing observed covariates between subjects in control and treatment study groups (Faries, Leon, Haro, Obenchain, 2010).

With respect to DM's effects on firms' performance, we adopt the same strategy as in the analysis of wage effects, but we don't control for any individual-level variables given the establishment-level data we use. Moreover, given our objective to explain the effects of DM on the whole system of firms' performance (including value-added per worker, wage cost per-worker, and profit per worker), we need to run more than one multiple regression equations, which may be linked statistically through the jointness of the distribution of the error terms and through the non-diagonal covariance matrix. In this case, estimating each individual equation using the OLS regression is consistent but is not efficient. So, it is desired to consider all the separate relationships collectively to draw the statistical inferences about the model parameters. We then use the Seemingly Unrelated Regression (SUR) to explain the jointness of the equations.

Empirical Findings

DM and Wage

The first research question we try to explore is whether working in DM establishments is associated with a wage premium for individual workers. Since the presence of DM institutions is highly correlated with the presence of union branches, simply examining the wage effects of DM institutions provides only a partial story. In this regard, we sought to explore whether the wage effect of DM institutions, if any, is independent from the wage effect of union presence.

Using firm-level data sets, previous studies in the context of China note that working in firms with union branches is associated with higher wages (wages are measured using the total wage cost divided by the payroll employment), the amount of the premium is around 5% to 8% (Yao and Zhong 2013; Ge 2014). These studies, however, do not consider

the role of DM institutions. To make our investigation comparable with this strand of literature, we start from the union wage effects, the results of which are presented in Columns 1-3) in Table 5, the dependent variable being individual's natural log of hourly wages. Using a specification similar to the one used in Ge (2014) (Column 1), we find that when only establishment-level characteristics are controlled for, the presence of establishment-level union branches is associated with a wage premium, the magnitude of which is very similar to the result in Ge (2014). The amount of union wage premium shrinks but remains significant when we further control for the propensity score of having a union branch, as well as employees' individual characteristics (Columns 2 and 3).

In Column 4 of Table 5, we add a dummy indicating whether a worker is working in a DM establishment. The wage effect of union branches drastically shrinks to zero and become insignificant, while the wage effect of DM is positive and significant, the magnitude being 4.4%. The magnitude and significance of DM wage effect change little when we add the propensity score of having DM institutions (Column 5). Taken together, the estimations reveal that for an individual worker, working in DM establishments is associated with a wage premium of 4.4% on average. However, we don't find evidence showing that the presence of establishment-level union branches alone could significantly improve individual workers' average hourly wages, which resonates with the findings in Lu, Tao and Wang (2010) and Budd, Chi, Wang and Xie (2014).

[Table 5 Here]

Table 6 reports the results on the existence and magnitude of DM wage effects, conditioning on the union presence. Column 1 adds an interaction term between the presence of DM and the presence of union branches to the model in Column 5 of Table 5. Columns 2 and 3 report the estimated wage effects of DM in firms with and without union

presence, respectively. Column 1 indicates a negative, though insignificant, interaction effect between the presence of DM institutions and the presence of union branches, implying that these two types of voice mechanisms do not complement each other in terms of increasing workers' wages. Columns 2 and 3 suggest that the wage effects of DM institutions are prominent in non-union establishments, the magnitude being around 6%. In establishment with union branches, the presence of DM institutions does not associated with significant wage effect.

One possible explanation for heterogeneous DM wage effects conditioning on the union presence is that in establishments with union branches, unions are responsible of helping workers signing individual contracts and collective contracts, through which workers gain a "voice" over the distribution of economic gains; thus, the wage effects (pie-sharing role) of DM is less prominent with the presence of union branches. On the contrary, the union-voice mechanism is absent in non-unionized firms so that DM institutions serve as an alternative mechanism that gives worker a say over the allocation of joint-economic gains. To check whether this explanation is plausible, we focus on establishments with union branches and check whether the DM's wage effects vary in these establishments conditioning on the effectiveness of the union-voice mechanism. A set of questions in the employee survey asks whether establishment-level union works to fulfill the following three responsibilities: (1) helping workers signing individual contract; (2) helping workers signing collective contract; (3) protecting workers' right at the workplace. We construct a "union-voice" dummy that equals 1 if workers give positive answers to at least one of the three questions. In Column 4, we add an interaction term between the presence of DM institution and the "union-voice" dummy to check whether union-voice mechanism and

DM-voice mechanism are substitutes. As are revealed in Column 4, in unionized firms where union-voice is absent ("union-voice" dummy equals 0), the wage effects of DM is positive and significant; in establishments with DM institutions and effective union-voice mechanism, the wage effects of DM is much lower than that in establishments with ineffective union branches. Taken together, the result in Column 4 provides a support for the statement that the wage effects of DM institutions are much weaker in establishments where union-voice is effective.

[Table 6 Here]

Considering that employment relations at the establishment level show a rich diversity related to types of ownership structures (Ge 2014; Yao and Zhong 2013), we examine the wage effects of DM institutions for firms of different ownership structures, the result of which is reported in Table 7. It is revealed that the DM institutions are associated with a prominent wage premium of around 28% in public-owned firms (state-owned enterprises and collectively owned enterprises) (Column 2). Among privately-owned enterprises (including foreign invested firms), the presence of DM is also associated with positive wage effect, though the effect is statistically insignificant (Column 3). Column 1 adds an interaction term with DM and publicly owned firms, the estimated coefficient of which is small and insignificant. This indicates that the wage effects associated with the presence of DM does not vary significantly between the publicly owned firms and privately-owned firms.

[Table 7 Here]

DM and Fringe Benefit

In the survey, workers are asked whether they are eligible to the following non-pecuniary benefits: firm-supported training and opportunities for internal promotion, low-price or

free housing, regular entertaining activities (e.g. recreational parties, sport activities and tourism activities), and workplace services (e.g. free meal plans, gym), as well as paid leaves. With this information, we examine the effects of DM institutions on workers' accessibility to these benefits.

Table 8 reports the effects of DM on the number of non-pecuniary benefits at workplaces for the entire sample and for firms of different ownership structures, respectively. The estimation is based on the Poisson regression[17]. Column 1 shows that, if the presence of DM is not considered, the presence of union branches is associated with positive and significant benefit effects. Column 2 adds the DM dummy to the model and reveals that the presence of DM and union branches are both associated with positive benefit effects. Column 3 shows that DM's benefit effect does not differ significant in union establishments versus non-union establishments.

[Table 8 Here]

Table 9 further explores how DM's benefit effects vary in firms with and without union branches. In both types of firms, the presence of DM is associated with positive and significant effects on the variety of non-pecuniary benefits. In firms with union branches, the effectiveness of union voice mechanism does not enhance DM's benefit effects.

[Table 9 Here]

Table 10 presents the effect of DM institutions on workers' eligibility to different workplace benefits. The estimations are based on pooled-logit regression. As are shown in the table, the presence of DM institutions increases the likely-hood of enjoying non-pecuniary benefits such as training and internal promotion, entertainment, workplace

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[17] We also tried estimating the same specifications with negative binomial regressions, the results of which are not different from those estimated using Poisson regressions.

services, free or low-priced housing. Table 11 reports the results of the same analysis by firms' ownership structures. For public-owned firms, the presence of DM institutions is associated with higher likelihood that a worker is eligible to benefits such as training and internal promotions, as well as free or low-priced housing. In privately-owned firms, the presence of DM institutions is associated with greater likelihood of getting access to all types of benefits.

[Tables 10 and 11 Here]

DM and Firms' Performance

In this section, we turn to analyzing the establishment-level data and examine the effect of DM institutions on three establishment-level performance indicators: firms' productivity, profitability and cost of labor. There's no perfect measurement of firms' productivity in our data sets. We follow Addison et al. (2001) and use value added per-worker as a measurement of firms' labor productivity, keeping in mind that this measurement may be confounded by the price and quantity effects (Addison et al 2001). With respect to firms' profitability, we measure it using firms' annual profit per worker (in million Yuan). To measure the cost of labor, we take the firms' total labor cost[18] divided by the total number of payroll employment and get the wage cost per worker.

Table 12 presents the results regarding the effects of DM institutions on firms' performance. We start from estimations based on the OLS regressions for three of the performance indicators, controlling for establishment-level characteristics and propensity scores of having DM institutions and unions. As are shown in the table, the presence of DM institutions is associated with higher added value per-worker and higher wage cost per

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[18] The total wage cost includes the total amount of compensation cost, cost of fringe benefits and cost of social security payments.

worker. The presence of DM institutions is, however, associated with negative profit effects. The results do not change much when we estimate the same specification with Seemingly Unrelated Regressions (SUR). These findings suggest that the DM institutions are playing a duel role of pie-growing and pie sharing at workplaces. On one hand, the empirical evidence shows that the presence of DM institutions has a positive effect on firms' labor productivity, which suggests that DM institutions engage both employees and the management in the process of productivity improvement. On the other hand, the empirical evidence in the previous section suggests that the presence of DM institutions is positively and significantly associated with workers' wages and accessibility to non-pecuniary benefits, which implies DM institutions give workers a "voice" over the distribution of joint economic gains. In addition, the presence of DM institutions in the workplace may exert pressure on the management to alleviate the exploitation of workers and thus increase the cost of production. The negative association between firms' profit and the presence of DM institutions imply that the productivity gain due to DM does not offset the cost. In practice, this would engender the employers' resistance of adopting DM institutions. However, this is only an issue of redistribution, not harming the efficiency of DM.

[Table 12 Here]

Table 13 explores whether the performance effects of DM institutions differ in establishments with and without union branches. The estimations are based on the SUR. The coefficients of interaction terms between DM institutions and union branches are insignificant, suggesting that the presence of union branches do not act as substitutes or complements of DM institutions in terms of improving firms' performance. A closer review shows two interesting patterns. On one hand, in establishments with union branches,

the presence of DM institution is associated with higher labor productivities, lower profit, and almost no significant increase in cost of labor. On the other hand, in establishments without union branches, the presence of DM institutions is associated with no significant productivity improvement, higher cost of labor and lower profit. These two patterns can be explained by the different roles that DM institutions play in establishments with and without union branches. In establishments without union branches, where workers' interests are not well accounted for, DM institutions work more like a mechanism of "collective voice" than a mechanism of "productivity improvement".[19] This leads to a negative profit effects associated with the presence of DM at these workplaces. On the other hand, in firms with union branches, where workers' interests are somehow better protected, workers could engage more in the production process through DM institutions. In this case the DM institutions work more like a mechanism of "productivity improvement" than a mechanism of "collective voice". However, the underlying mechanisms leading to DM's negative profitability effects remain vague in non-union establishments, which calls for future research. To sum up, even if the establishment-level DM institutions in China have a duel role of "pie-growing" and "pie-sharing" in general, the "pie-growing" role is more prominent in establishments with union branches and the "pie-sharing" role more prominent in establishments without union branches.

[Table 13 Here]

Table 14 presents the results for the effects of DM institutions by firms' ownership structures, based on the SUR models. It is revealed that in publicly-owned firms, the presence of DM institutions is associated with positive effects on labor productivity and

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[19] As we have observed in Table 7, the presence of DM institutions is associated with wage premium only for individual workers in firms without union branches.

wage cost but negative effects on profit per worker, though all three effects are statistically insignificant due to large noise. In privately-owned firms, the presence of DM institutions is, however, associated with positive but insignificant productivity effects, positive and significant effects on labor cost, as well as a negative and significant profit effects. Note that for privately-owned enterprises, we observe that the presence of DM institutions is associated with higher wage cost at the establishment level, but we don't observe any significant DM's wage effects at the individual level (Table 7). The higher wage cost in privately-owned enterprises may be attributed to the systematic differences in the distribution of workers' abilities between DM establishments and non-DM establishments.

[Table 14 Here]

Conclusions

Based on the employer-employee matched data, we examine the effects of DM institutions on workers' wages, on workers' accessibility to fringe benefits, as well as on firms' productivity and profitability. Table 15 summarizes major empirical findings of this study.

[Table 15 Here]

In general, we document that workplace DM are not rubber-stamp institutions, rather, they take on the roles of both "pie-growing" and "pie-sharing": the presence of DM institutions is associated with higher wages at individual-level and higher labor cost at establishment-level; the presence of DM institutions also increases individual workers' accessibility to benefits; DM establishments have higher labor productivity on average, but the annual profit per worker is lower, compared to non-DM establishments. Negative profit effects imply that, from the perspective of the management, the cost of DM exceed its economic gains.

We also find that the roles of DM vary conditioning on the presence of union branches. That is, the DM institutions and establishment-level union branches act more as substitutes than complements in terms of increasing workers' wages. Specifically, we find that in establishments where workers' interests are not well accounted for by the union-voice mechanism, DM acts more as a mechanism of "pie-sharing", leading to higher wages. On the contrary, in establishments where workers' interests are well accounted for, DM acts more as a mechanism of "pie growing", leading to higher labor productivity.

Taken together, the above findings provide the first representative picture of the economic effects of DM institutions at workplaces in China, which sheds new lights on implications and future research directions. First, this study reveals the economic logic of Chinese government's recent attempts to promote DM at workplaces: not only as a method to fulfill the Party's ideological premise that workers are the masters of the state, but also as a mechanism of "pie growing and pie sharing". Considering that there's no collective bargaining of real sense in China, promoting DM would provide an alternative collective-voice mechanism at workplaces, which not only improves workers' welfare but also contribute to firms' productivity. This could be a new direction on China's way to "harmonious labor relations".

Second, we compare, for the first time, the effects of Chinese union and non-union employee participation mechanisms at workplaces. Our findings reveal that although the presence of DM and union branches are highly correlated, they play very different roles at workplaces. On one hand, the priority goal of Chinese firm-level trade unions is not redistributing joint economic gains, but to maintain industrial peace. In practice, workplace trade unions help conveying workers' demand to the management, and incentivize workers,

via providing various fringe benefits, to follow the instructions of the management. Our empirical findings support this statement by showing that the presence of firm-level trade unions is associated with positive benefit effect and no significant wage effects. On the other hand, different from trade unions, the role of DM is "promoting co-construction and mutual benefits of labor and management". Our findings support this statement by showing that the presence of DM at workplaces gives worker a say over the distribution of economic gains, which prevents firm-level unions from compromising too much; and at the same time, the presence of DM also contributes to higher productivities in general. In contrast with DM's important economic role is a paucity of studies regarding the operation of DM in practice. Therefore, more efforts shall be made in the future to see through this black-box.

Third, there are also implications for the management. As are revealed in this study, implementing DM institutions at workplaces does generate higher wages to workers and higher labor productivities to firms. Although the presence of DM is associated with negative profit effects, from the perspective of economics, this is consistent with efficiency. In the short run, the negative profit effects may prevent firms, especially those in the private sectors, from adopting DM institutions. Such management, however, may be locked into a low-cost-low-productivity-low-wage regime, which would be detrimental to firms' competitiveness in the long run.   Therefore, there is a need for the management to learn about, and to come to terms with the DM institutions.

Notwithstanding the implications outlined above, the present study has limitations. First, given the information available in our survey-based data set, some of the measurements used in this study are quite general, including the measurements of DM and

firms' performance. These must be kept in mind when interpreting the results. Second, given what we have for now, the details of workplace DM practices remain as a black-box. We are not able to provide a scrutinized analysis of the underlying mechanisms leading to DM's effects on wages, productivity and profitability. In future research, efforts shall be made to explore deep inside the workplaces for undiscovered mechanisms. Third, given the cross-sectional nature of our data set, the unobserved individual and firm characteristics may be associated with the presence of DM institutions, as well as the wages and firms' performance. However, given the efforts we spent on dealing with the endogeneity of DM presence, as well as our efforts on controlling for heterogeneity at the individual level and at firm level, the unobserved part should account for a very small proportion, which will not alter our major findings.

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Table 1 Sample selection criteria

	Remaining Number of Workers		
	All Establishments	Establishments with DM institutions	Establishments without DM institutions
All	4532	2548	1984
Weekly working hours 30-100	4418	2496	1922
Age 18-65	4303	2445	1858
Non-dispatched employees	4170	2349	1821
Valid establishment-level DM variables	4156	2349	1807
Valid employee characteristics	4111	2323	1778
Valid employee-level wage/benefits	3856	2198	1658
Valid establishment characteristics	3559	2068	1491
Final number of workers in the sample	3559	2068	1491
	Remaining Number of Establishments		
	All Establishments	Establishments with DM institutions	Establishments without DM institutions
All establishements with sampled workers	384	218	166
Valid performance indicator	332	189	143
Final number of firms in the sample	332	189	143

Table 2 Distribution of DM institutions

	# of Establishments	Democratic Management (DM)	SWRC	OPEN	WRBSD
Establishments with union branches	172	76.74%	62.79%	40.69%	22.67%
Establishments without union branches	160	35.63%	16.25%	16.88%	11.88%
Public-owned enterprises	84	76.19%	64.29%	40.48%	25%
Privately-owned enterprises	248	50.40%	32.26%	25.40%	14.92%

Note: SWRC refers to the institution of Staff and Workers' Representation Conferences; OPEN refers to the institution of "Disclosure of Factory's Affairs"; WRBSD refers to the institution of Workers' Representatives on Boards of Supervisors and Directors.

Table 3 Summary statistics for employees in the sample.

Workers' Characteristics	All establishments	DM Establishments (57.98%)	Non-DM Establishments (42.02%)	|t|-Stats: DM Eastablishments vs. Non-DM Establishments
	N=3559	N=2068	N=1491	
Demographic charactreristics				
Female (%)	0.55	0.54	0.55	0.59
Age	33.71	33.70	33.71	0.01
Years of schooling	12.85	12.96	12.70	2.62
Single (%)	0.31	0.31	0.30	0.78
Married (%)	0.67	0.67	0.68	0.51
Union Member (%)	0.22	0.31	0.11	14.92
CCP Member (%)	0.13	0.16	0.09	6.18
Non-agricultral Hukou (%)	0.64	0.64	0.64	0.41
Worker type				
Management staff (%)	0.18	0.19	0.16	3.05
Professionals or technicians (%)	0.13	0.13	0.13	0.13
Clerks or administrative workers (%)	0.11	0.11	0.10	0.96
Skilled blue collar workers (%)	0.08	0.07	0.08	-0.05
Unskilled blue collar workers (%)	0.51	0.49	0.54	2.95
Wage and benefit information				
Weekly working hours	46.86	46.35	47.57	4.22
Hourly wages	12.87	13.07	12.60	1.72
Number of non-pecuniary benefits (Mean)	1.88	2.00	1.71	7.63
Non-pecuniary benefits: housing (%)	0.09	0.11	0.07	4.15
Non-pecuniary benefits: training and promotion (%)	0.14	0.16	0.11	4.04
Non-pecuniary benefits: entertainment (%)	0.39	0.42	0.35	4.45
Non-pecuniary benefits: workplace service (%)	0.55	0.57	0.52	2.60
Non-pecuniary benefits: paid leave (%)	0.40	0.42	0.38	2.72
Distribution across firms of different ownership structures				
State-Owned Enterprises (SOEs) (%)	0.17	0.24	0.07	14.60
Collectively Owned Enterprises (COEs) (%)	0.10	0.12	0.08	4.35
Privately Owned Enterprises (POEs) (%)	0.67	0.58	0.80	14.67
Hong Kong, Macao, Taiwan and Foreign Invested Enterprises (FIEs) (%)	0.05	0.05	0.05	0.89

Table 4 *Summary statistics for establishments in the sample.*

	All establishments	DM Establishments	Non-DM Establishments	|t|-Stats: DM Eastablishments vs. Non-DM
	N=332	N=189	N=143	
Staff and workers' representative congress	0.40	0.71	-	-
Disclosure of factory affairs	0.29	0.52	-	-
Workers' representatives on the board of supervisors and directors	0.17	0.30	-	-
Establishment Characteristics				
Establishment-level trade union	0.52	0.71	0.28	*8.06*
Share of union members (Mean)	0.30	0.41	0.15	*5.80*
Establishment size (# of Staffs and Workers)	273.84	381.01	135.49	*1.98*
Establishment Age	15.31	17.44	12.56	*3.65*
Share of college graduates (Mean)	0.17	0.18	0.16	*0.54*
Share of workers above 50 (Mean)	0.11	0.10	0.12	*1.02*
Share of management (Mean)	0.15	0.15	0.14	*0.94*
Share of temparory workers (Mean)	0.02	0.02	0.02	*0.46*
Share of unskilled blue-collar workers (Mear	0.46	0.45	0.46	*0.21*
Share of female workers (Mean)	0.58	0.58	0.57	*0.35*
Establishment ownership				
SOE	0.15	0.21	0.06	*4.49*
Collectively Owned Enterprises	0.11	0.13	0.07	*1.95*
Privately Owned Enterprises	0.70	0.61	0.81	*4.56*
Hong Kong, Macao, Taiwan and Foreign Invested Enterprises	0.05	0.05	0.06	*0.18*
Firms' Performance Indicators				
Annual revenue (in 10 thousand RMB)	11160.65	15659.65	5419.38	*1.69*
Annual total wages (in 10 thousand RMB)	1325.42	1909.33	580.28	*1.97*
Annual value added (in 10 thousand RMB)	950.06	1465.80	291.91	*3.03*
Weekly working hours in 2012 (Mean)	45.05	44	46	*2.27*
Annual profit (in 10 thousand RMB)	1048.78	1045.85	1052.52	*0.01*

Table 5 The wage premium of working in DM establishments

Dependent variable: Individual Workers' (Log) Hourly Wages

	(1)	(2)	(3)	(4)	(5)
	Union Wage Premium			DM Wage Premium	
Damocratic management (DM)				0.044*	0.044*
				[0.019]	[0.019]
Union	0.057**	0.051*	0.040*	0.004	-0.009
	[0.020]	[0.020]	[0.019]	[0.021]	[0.026]
Establishment-level characteristics	YES	YES	YES	YES	YES
(Mean) employee characterisics by establishment	YES	YES	YES	YES	YES
Employees' individual characteristics	NO	NO	YES	YES	YES
Propensity score of having a establishment-level union	NO	YES	YES	YES	YES
Propensity score of having DM institutions	NO	NO	NO	NO	YES
Observations	3,559	3,559	3,559	3,559	3,559
R-squared	0.300	0.300	0.369	0.372	0.372

Notes: (1) The dependent variable is the natural log of an individual's hourly wage. (2) The model is estimated based on the OLS regression. (3) The " Damocratic management (DM) " is defined as: 1= "The establishment has adopted at least one of the three institutions as Staff and Workers' Representative Congress (SWRC), Disclosure of Factory's Affairs, or Workers' Representatives on the Boards of Supervisors and Directors. "; otherwise, 0. "Union " is defined as :1="The establishment has a grassroot union branch", otherwise, 0) are included. (4) Control variables include: (a) establishment-level characteristics: The size of establishment and its quadratic form, establishment age, the types of establishment's ownership structure,as well as dummies indicating industrial groups and geographical regions. (b) establishment-level workers' characteristics: share of employees with at least college education, share of employees above 50, share of management staffs, share of temporary or dispatched workers. (c) Individual workers' characteristics are also included as control variables, such as gender, years of schooling, an indicator of China Communist Party membership, an indicator of union membership, worker type, and hukou status. (5) The predicted propensity scores of observing DM institutions and a establishment level union are added to the model. This attempts to deal with the possible endogeneity of DM institutions and establishment-level union. (7)The robust standard errors are reported in the brackets. (8) **, * denote significance at the 0.01, 0.05 levels, respectively.

Table 6 The wage premium of DM institutions: the role of establishment-level union

Dependent variable: Individual Workers' (Log) Hourly Wages

	(1)	(2)	(3)	(5)
	All	Firms without Union Branches	Firms with Union Branches	
Damocratic management (DM)	0.064*	0.062*	0.010	0.206**
	[0.025]	[0.028]	[0.033]	[0.076]
Union	0.013			
	[0.034]			
Damocratic management (DM) * Union	-0.042			
	[0.037]			
Union Help Signing Contracts and Protecting Workers' Rights				0.189**
				[0.069]
Damocratic management (DM) * Union Help Signing Contracts and Protecting Workers' Rights				-0.217**
				[0.080]
Firm-level characteristics	YES	YES	YES	YES
(Mean) employee characterisics by firm	YES	YES	YES	YES
Employees' individual characteristics	YES	YES	YES	YES
Employees' union membership indicator	YES	YES	YES	YES
Propensity score of having a firm-level union	YES	YES	YES	YES
Propensity score of having DM institutions	YES	YES	YES	YES
Observations	3,559	1,629	1,930	1,930
R-squared	0.372	0.459	0.389	0.343

Notes: (1) The dependent variable is the natural log of an individual's hourly wage. (2) The model is estimated based on the OLS regression. (3) The control variables are defined as in Table 5. (4)The robust standard errors are reported in the brackets. (5) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 7 The wage premium of DM institutions: public vs. private firms

	(1)	(2)	(3)
Dependent variable: Individual Workers' (Log) Hourly Wages			
	All	Publicly-Owned Firms, All	Privately-Owned Firms
Damocratic management (DM)	0.046*	0.281**	0.032
	[0.021]	[0.053]	[0.022]
Publicly Owned Firms	-0.171*		
	[0.071]		
Damocratic management (DM) * Publicly Owned Firms	-0.006		
	[0.040]		
Union	-0.009	-0.124	0.007
	[0.026]	[0.097]	[0.029]
Firm-level characteristics	YES	YES	YES
(Mean) employee characterisics by firm	YES	YES	YES
Employees' individual characteristics	YES	YES	YES
Employees' union membership indicator	YES	YES	YES
Propensity score of having a firm-level union	YES	YES	YES
Propensity score of having DM institutions	YES	YES	YES
Observations	3559	989	2,570
R-squared	0.372	0.444	0.404

Notes: (1) The dependent variable is the natural log of an individual's hourly wage. (2) The model is estimated based on the OLS regression. (3) The control variables are defined as in Table 5. (4)The robust standard errors are reported in the brackets. (5) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 8 The benefit effects associated with DM institutions

Dependent Variable: The number of non-pecuniary benefits			
	(1)	(2)	(3)
Damocratic management (DM)		0.088**	0.081*
		[0.024]	[0.032]
Union	0.118**	0.099**	0.091*
	[0.033]	[0.034]	[0.042]
Damocratic management (DM) * Union			0.014
			[0.049]
Firm-level characteristics	YES	YES	YES
(Mean) employee characterisics by firm	YES	YES	YES
Employees' individual characteristics	YES	YES	YES
Employees' union membership indicator	YES	YES	YES
Propensity score of having a firm-level union	YES	YES	YES
Propensity score of having DM institutions	YES	YES	YES
Observations	3,559	3,559	3,559

Notes: (1) The dependent variable is the number of non-pecuniary benefits that a worker is eligible to. (2) The model is estimated based on the Poisson regression. (3) All specifications contain the set of control variables as are defined in Table 5. (3)The robust standard errors are reported in the brackets. (4) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 9 The benefit effects associated with DM institutions: the role of union branches

Dependent Variable: The number of non-pecuniary benefits

	(1)	(2)	(3)
	Firms with union branches		Firms without union branches
Damocratic management (DM)	0.107**	0.497**	0.116**
	[0.039]	[0.107]	[0.035]
Union Help Signing Contracts and Protecting Workers' Rights		0.366**	
		[0.083]	
Damocratic management (DM) * Union Help Signing Contracts and Protecting Workers' Rights		-0.443**	
		[0.113]	
Firm-level characteristics	YES	YES	YES
(Mean) employee characterisics by firm	YES	YES	YES
Employees' individual characteristics	YES	YES	YES
Employees' union membership indicator	YES	YES	YES
Propensity score of having a firm-level union	YES	YES	YES
Propensity score of having DM institutions	YES	YES	YES
Observations	1,930	1,930	1,629

Notes: (1) The dependent variable is the number of non-pecuniary benefits that a worker is eligible to. (2) The model is estimated based on the Poisson regression. (3) All specifications contain the set of control variables as are defined in Table 5. (3)The robust standard errors are reported in the brackets. (4) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 10 The effects of DM institutions on the eligibility of different non-pecuniary benefits.

Dependent Variable: whether a worker is eligible to a specified benefit

	Training and Internal Promotion		Entertainment		Workplace Service		Free or Low-Priced Housing	
	Coeff.	Odds ratio	Coeff.	Odds ratio	Coeff.	Odds ratio	Coeff.	Odds ratio
Damocratic management (DM)	0.286*	1.331*	0.153+	1.165+	0.299**	1.349**	0.713**	2.040**
	[0.124]	[0.165]	[0.092]	[0.107]	[0.090]	[0.121]	[0.159]	[0.323]
Establishment-level union	0.210	1.234	0.099	1.104	0.389**	1.475**	0.163	1.177
	[0.158]	[0.195]	[0.120]	[0.132]	[0.121]	[0.179]	[0.207]	[0.244]
Employee characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Establishment characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Propensity score of having ER and union	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3559	3559	3559	3559	3559	3559	3559	3559

(1) The dependent variable is the dummy indicating whether an individual is eligible to the specified employee benefits. (2) The model is estimated based on the logit regression. (3) All specifications include variables as is stated in Table 5. (4)The robust standard errors are reported in the brackets. (5) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 11 The effects of DM institutions on the eligibility of different non-pecuniary benefits, by firms' ownership structures

Dependent Variable: whether a worker is eligible to a specified benefit								
Public-owned Enterprises								
	Training and Internal		Entertainment		Workplace Service		Free or Low-Priced	
	Coeff.	Odds ratio	Coeff.	Odds ratio	Coeff.	Odds ratio	Coeff.	Odds ratio
Damocratic management (DM)	0.759*	2.136*	0.019	1.019	0.233	1.262	1.704+	5.498+
	[0.386]	[0.824]	[0.216]	[0.221]	[0.260]	[0.328]	[0.899]	[4.941]
Establishment-level union	0.565	1.760	0.113	1.119	0.387	1.472	-1.847	0.158
	[0.549]	[0.966]	[0.346]	[0.388]	[0.345]	[0.508]	[1.571]	[0.248]
Employee characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Establishment characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Propensity score of having ER and uni	YES	YES	YES	YES	YES	YES	YES	YES
Observations	989	989	989	989	989	989	989	989
Privately-owned Enterprises								
	Training and Internal		Entertainment		Workplace Service		Free or Low-Priced Housing	
	Coeff.	Odds ratio	Coeff.	Odds ratio	Coeff.	Odds ratio	Coeff.	Odds ratio
Damocratic management (DM)	0.256+	1.292+	0.189+	1.208+	0.262*	1.299*	0.675**	1.964**
	[0.140]	[0.181]	[0.109]	[0.132]	[0.104]	[0.135]	[0.170]	[0.334]
Establishment-level union	0.061	1.062	0.075	1.078	0.345**	1.411**	0.377+	1.457+
	[0.186]	[0.198]	[0.141]	[0.152]	[0.133]	[0.187]	[0.214]	[0.312]
Employee characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Establishment characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Propensity score of having ER and uni	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2570	2570	2570	2570	2570	2570	2570	2570

(1) The dependent variable is the dummy indicating whether an individual is eligible to the specified employee benefits. (2) The model is estimated based on the logit regression. (3) All specifications include variables as is stated in Table 6. (4)The robust standard errors are reported in the brackets. (5) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 12 The effects of DM institutions on firms' performance

	OLS			Seemingly Unrelated Regression		
	Added value per worker	Labor cost per worker	Annual Profit per worker	Added Value per worker	Labor cost per worker	Annual Profit per worker
Damocratic management (DM)	2.341+	1.865+	-0.041*	2.341+	1.865**	-0.041**
	[1.237]	[1.100]	[0.018]	[1.405]	[0.599]	[0.016]
Union	-0.657	-1.355	-0.002	-0.657	-1.355+	-0.002
	[1.706]	[0.921]	[0.029]	[1.859]	[0.793]	[0.021]
Establishment-level characteristics	YES	YES	YES	YES	YES	YES
Propensity scores of having DM and union	YES	YES	YES	YES	YES	YES
Observations	332	332	332	332	332	332
R-squared	0.134	0.217	0.187	0.134	0.217	0.187

Notes: (1) In addition to the propensity scores of DM and union presence, all specifications contain two sets of establishment-level control variables：(a) establishment-level characteristics: The size of establishment and its quadratic form, establishment age, the types of establishment's ownership structure,as well as dummies indicating industrial groups and geographical regions. (b) establishment-level workers' characteristics: share of employees with at least college education, share of employees above 50, share of management staffs, share of temporary or dispatched workers. (2)The robust standard errors are reported in the brackets. (3) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 13 The effects of DM institutions on firms' performance: the role of trade unions

	(1) Value-added per worker			(2) Labor cost per worker			(3) Annual Profit per worker		
	All	Firms with union branches	Firms without union branches	All	Firms with union branches	Firms without union branches	All	Firms with union branches	Firms without union branches
Damocratic management (DM)	1.760	3.109+	0.309	2.540**	0.069	3.166**	-0.026	-0.056*	-0.031+
	[1.884]	[1.676]	[2.253]	[0.801]	[0.494]	[1.018]	[0.021]	[0.024]	[0.016]
Union	-1.334			-0.568			0.015		
	[2.365]			[1.006]			[0.026]		
Damocratic management (DM) * Union									
	1.252			-1.457			-0.031		
	[2.709]			[1.153]			[0.030]		
Firm-level characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES
Propensity score of having DM and unions	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	332	172	160	332	172	160	332	172	160
R-squared	0.135	0.155	0.281	0.221	0.334	0.402	0.19	0.298	0.493

Notes: (1) The estimations are made based on SUR models. All specifications contain the set of control variables as are defined in Table 12. (2)The robust standard errors are reported in the brackets. (3) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 14 The effects of DM institutions on firms' performance, by firms' ownership structure

	(1)			(2)			(3)		
	Value-added per worker			**Labor cost per worker**			**Annual Profit per worker**		
	All	Publicly-Owned Firms	Privately-Owned Firms	All	Publicly-Owned Firms	Privately-Owned Firms	All	Publicly-Owned Firms	Privately-Owned Firms
Damocratic management (DM)	3.050*	1.030	2.153	1.893**	1.142	2.086**	-0.036*	-0.030	-0.039*
	[1.538]	[3.750]	[1.448]	[0.657]	[0.854]	[0.747]	[0.017]	[0.023]	[0.019]
DM*Publicly-Owned Firms	-3.501			-0.140			-0.022		
	[3.121]			[1.333]			[0.035]		
Publicly-Owned Firms	5.000			-6.097**			0.067		
	[4.252]			[1.817]			[0.047]		
Union	-0.537	-5.243	1.006	-1.351+	-1.491	-1.229	-0.001	0.005	-0.004
	[1.858]	[5.273]	[1.876]	[0.794]	[1.201]	[0.968]	[0.021]	[0.033]	[0.024]
Firm-level characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES
Propensity score of having DM and union	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	332	84	248	332	84	248	332	84	248
R-squared	0.138	0.297	0.148	0.217	0.450	0.209	0.188	0.375	0.231

Notes: (1) The estimations are made based on SUR models. All specifications contain the set of control variables as are defined in Table 12. (2)The robust standard errors are reported in the brackets. (3) **, *, + denote significance at the 0.01, 0.05 and 0.1 levels, respectively.

Table 15 The effects of DM institutions on wages and firms' performance: a brief summary of empirical findings

	Pie-Sharing Effects			Pie-Growing Effects	
	Employee Level			Establishment Level	
	Individual Workers' Wage	Accessibility to Benefits	Labor Cost Per Worker	Value Added Per Worker	Profit Per Worker
	Direction of DM's Effects				
All	+	+	+	+	-
Firms with union branches	+(insignificant)	+	+(insignificant)	+	-
Firms without union branches	+	+	+	+(insignificant)	-

Notes:"+" denotes a positive and significant effect effect associated with the presence of DM institutions. "-" denotes a negative and significant effect associated with the presence of DM institutions. "+(insignificant)" denotes a positive and insignificant DM effect. "-(insignificant)" denotes a negative and insignificant DM effect.