Labor Contention in China: A Statistical Perspective

Abstract: Much of the China studies literature portrays a China facing a rising threat of domestic instability due in part to contention in labor relations. Such work is well-supported by interviews but lacks the quantitative analysis that would allow effective generalization from factory, town, and province to China as a whole. To remedy this situation, this paper uses data from China's National Bureau of Statistics, focusing on arbitrated labor disputes as a form of contention. Using a constant-elasticity model, I test eight hypotheses from the literature, assessing associations with enterprise ownership structure, household income, foreign-invested enterprise employment, unionization, and union legal aid. I find substantial support for the notion that employment by foreign-invested enterprises is tied to contention. Further, I find that unionization's effects are stronger than commonly thought, but vary drastically depending on the ownership of the enterprise being unionized.

Since China's opening to the market in 1978, the relationship between economic growth, control of labor, and contentious politics has always been important. The rural "household responsibility" system that allowed reforms to begin in earnest was partly a reaction to peasants who liberalized rural farming far faster than hesitant party leaders might have preferred (Naughton 1995, 140). It was also partly a decision made to earn popular support for a new regime (Naughton 1995, 62). More recently, much of the China studies literature portrays a China where "not only effective governance but even regime survival may be at risk" due to domestic instability (Chung et al. 2006)[1]. Many of these concerns about regime stability may be overplayed: Gilley (2009) argues persuasively that concerns about regime stability are a result of observers ignoring the role of regime legitimacy. Further, Pei (2006) argues that the Chinese Communist Party is thoroughly "flexible in tactical terms" (207), allowing a certain resilience. Nevertheless, concerns persist about contention in China. Much of this work is well-supported by interviews but lacks the quantitative analysis that would allow effective generalization from factory, town, and province to China as a whole.

The scope of this paper is narrower than Chung's overview of regime stability, and instead focuses on arbitrated labor disputes as a form of labor contention[2]. . While these disputes take place in a legal system, they are not solely legalistic actions[3]. They take place in an environment where access to the labor dispute resolution system depends on participation in other forms of contention. Workers are often unable to resolve grievances through the legal system without simultaneously engaging in some form of protest to gain the attention of local authorities. O'Brien & Li describe this dynamic in their study on rural "rightful resistance", arguing that "rightful resisters may mobilize popular action, but their main aim is to use the threat of unrest to attract attention from possible mediators and to apply pressure on officeholders at higher levels to rein in their underlings" (68). Lee cites a case of migrant workers paid below the minimum wage, who claim that "the Labor Bureau couldn't care less about us migrant workers… We were about to march to the city government when the Legal Aid Center intervened and the Labor

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[1] Chung 2006 includes a listing of works making this claim, pg. 1 n1

[2] Presenting a formal, legalistic process like arbitration as a form of contention might worry readers familiar with the social movements literature, since they cannot be included in Gurr's typology of strife (Gurr 1968), do not have the permanence to characterize a true Social Movement Organization (McCarthy and Zald 1977), and do not seem to have the newly-identified actors or innovative actions of transgressive contention (McAdam et al. 2001). This paper classes arbitration cases as contentious through O'Brien's "boundary-spanning contention" (O'Brien 2002), which asserts that collective actions may be perceived as transgressive by local authorities, but perceived as contained by higher levels of the government.

[3] Though most of the scholars concerned would call labor arbitration a bad measure of labor unrest (particularly (Cooke 2008) and (Thireau and Hua 2003), their objections would not extend to denying its relevance. Instead, they point to a lack of detail in the statistics (Cooke 2008), to fees that hinder arbitration by poorer workers, and to the informal mechanisms through which a majority of labor disputes are addressed (Thireau and Hua 2003).

Bureau immediately arranged for mediation" (Lee 2007, 179). These "boundary-spanning acts" are of tremendous importance, showing actors engaged in claims-making that wavers "between official, prescribed politics and politics by other means" (O'Brien 2002, 52). Moreover, understanding the course of labor contention in China is important for understanding China's overall political development.

Contentious collective action in China has taken place in a wide variety of environments. Peasant resistance to local corruption and land requisitions is quite widespread (O'Brien and Li 2006). In the cities, grievances over crime and environmental policy have also resulted in contention (O'Brien 2008). However, this paper will focus on labor contention, which has attracted particular attention because of its severity (Tanner 2004). Using province-level[4] labor dispute data, this paper will test a number of hypotheses on the nature and causes of this form of contentious action in the Chinese economy. Specifically, the paper will predict labor disputes using median household income, foreign-invested enterprise employment, the distribution of jobs by type of enterprise ownership, and the proportion of workers employed in unionized enterprises of each ownership type. By doing so, this paper provides the opportunity to examine China's contentious politics in a new light – with national level quantitative data.

This paper begins by detailing the phenomenon being explained, labor disputation, and relating it to contention. Having clarified the scope of disputation, we survey the literature from social movements, law & society, industrial and labor relations, and China studies, as each relates to contention in China. The methodology section follows, explaining and justifying the use of a log-linear AR(1) model with panel-corrected standard errors. A data section explains how each variable is operationalized, with particular emphasis on the accuracy of data series from China's National Bureau of Statistics. Eight hypotheses are offered, elucidating the expected influences of enterprise ownership, income, foreign-invested enterprise employment, unionization, and union legal aid. A findings section summarizes the data, presents the resulting model, and evaluates the hypotheses in light of the results. Conclusions describe what data might allow the findings to be expanded upon, and express how the substantive findings might apply to future research.

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[4] The People's Republic of China directly administers 22 provinces, four municipalities, and five autonomous regions. Labor dispute data is available for each. It is more technically appropriate to call these regions 'province-level administrative units' rather than 'provinces', but in the interest of remaining concise this paper uses 'province' to refer to all 31 regions.

The Labor Disputation Process and Labor Contention

Much of the supporting literature for this paper is drawn from the contentious politics tradition (McAdam et al. 2001). However, the topic at hand is narrower than contention. Specifically, this paper addresses a category of contentious politics in China, the portion that relates to workers and their interactions with employers and the government. Following Chen, I term these interactions "labor contention" (Chen 2003). As will be made clear, I am unable to measure even this form of labor contention directly. Instead, I use Chinese state statistics to measure rates of collective participation in China's labor dispute resolution process. This form of interaction I term "labor disputation".

Labor dispute resolution in China is often described as a three-step process, although it can involve anything from one step to four, depending on appeals. The first stage of the process is mediation through Enterprise Mediation Committees organized by the All-China Federation of Trade Unions (ACFTU) (Gallagher 2005a, 67). This stage is not mandatory and has been largely confined to the State-owned sector (Ho 2003, 61). The number of mediations per year has been falling precipitously since the mid 1990s (Gallagher 2005a, 70).

The second stage of the labor dispute process is arbitration. Arbitration committees are permitted to refuse cases, and though Ho (2003) indicates that it is possible to proceed to litigation after being denied arbitration, it is not possible to bypass an arbitration committee when it is willing to consider the dispute (Ho 2003, 80). The actual process of arbitration is very legalistic, with complaints framed in terms of specific violations of labor law or of labor contracts (Ho 2003, 65-66). Arbitrators are selected on a "tripartite" basis - representing government, enterprises, and employees. However, employees are represented not by an independent worker organization but by the ACFTU (Gallagher 2005a, 58). Arbitration can be requested for disputes between individual employees and employers, or for collective disputes between employers and a group of three or more workers (Gallagher 2005a, 58).

After the arbitration committee has made its decision, either party can appeal to the courts – the third stage of labor disputation is litigation under the Civil Procedure Law. Additionally, though the Labor Law only describes three stages of labor disputation, it is possible to obtain a fourth hearing by appealing the court's decision under the Civil Procedure Law or the Administrative Litigation Law (Ho 2003, 77).   In practice, employers often take

advantage of these opportunities to lengthen the labor dispute process, appealing even in clear-cut cases so as to coerce employees into a settlement (Ho 2003, 69).

Literature Review

Though subfields of economics, political science, and sociology have theories on the growth of labor contention in China, the bulk of the work comes from the intersection of China studies and social movements. The main contribution of China studies has been in advocating "'equal time' for cultural practice and social structure" (Perry 1994, 5). However, China studies also serves as a focal point for contributions from other disciplines on the issue of Chinese labor politics. Of all these contributions, works coming from the social movements literature are by far the most thoroughly integrated with the particularistic concerns of China studies.

Social Movements

In an intuitively sensible approach to social movements, early theories asserted that collective actions could best be explained by the nature of popular grievances. For example, Gurr attributes strife to a "discrepancy between the 'ought' and the 'is' of collective value satisfaction"(Gurr 1970, 23). However, explaining the nature of grievances have not proven as successful as explaining how grievances are turned into actions. Consequently our primary focus is on theories of resource mobilization and contentious politics.

Resource Mobilization. More widely used today are resource mobilization theories of social movements (McCarthy and Zald 1977). McCarthy and Zald's formulation focuses on formal Social Movement Organizations, observing their efforts to convert nonadherents to adherents (believers) and adherents to constituents (supporters) (1221). This school of thought has found support within China studies, with recent works noting the successes of environmental NGOs and of collective petitions to provincial governments (O'Brien and Li 2005, 39; Sun and Zhao 2008). Applied to labor politics, resource mobilization suggests that social movement support can be drawn from "conscience constituents", people who do not have a stake in the outcome of contention (McCarthy and Zald 1977, 1216). Further, it suggests that the greater the "resource pools" of labor and capital available to a SMO, the greater that organization's ability to take action (1232). Though we cannot operationalize these detailed predictions of

resource mobilization theory with our current dataset, we can fall back on a simpler conception of resources. McCarthy and Zald hypothesize that the resources of the social movement sector increase "as the amount of discretionary resources of mass and elite publics increases" (McCarthy and Zald 1977, 1224). Since McCarthy and Zald define "discretionary resources" as "time and money which can easily be reallocated," it is reasonable to use household income, rather than overall wages, as an approximation (McCarthy and Zald 1977, 1224). Accordingly, I expect that rates of participation in labor disputation will increase with median household income in urban areas.

Opportunity Structure. The framework of contentious politics proffers perhaps the broadest possible application of theories concerning social movements. It includes behavior that is "episodic rather than continuous, occurs in public, involves interactions between makers of claims and others, is recognized by those others as bearing on their interests, and brings in government as mediator, target, or claimant" (McAdam et al. 2001, 5) Within this framework, the political process tradition offers a distinct view on the predictors of contention (Tarrow 2008, 8). Rather than focusing on resources or grievances, the political process model uses the opportunity structure, the "degree to which groups are likely to be able to gain access to power and to manipulate the political system" (Eisinger 1973, 25) to indicate the extent of contention. Opportunity structure is conditioned not only by the material resources of workers but also by the institutional environments laborers work and live in. In the context of China's labor politics, this has a meaningful implication: the structure of enterprise ownership (private, state-owned, foreign) is important, because not only grievances but also opportunities will differ by sector. In fact, changes in the ownership structure of the economy are often advanced as a major reason for the outbreak of labor disputes (Cooke 2008; Chen 2008; Cheng 2004).

Solinger captures the reasons behind this consensus, writing that "the outcomes of marketization… must be understood in conjunction with institutional legacies left from the former socialist system" (1999, 8-9). Lee goes further by arguing that this institutional background fosters tremendous differences between protests in the state and private sectors (Lee 2007, 12). Workers in state-owned enterprises are not bound to their jobs and homes by labor contracts. They remain in their jobs because they lack good alternatives in the market economy. Their jobs, in turn, are protected by a "socialist, class-sensitive discourse" (Lee 2007, 62) that honors industries left over from the pre-reform era. These workers, with great moral standing but modest legal standing, have little incentive to engage in labor disputes as long as their privileges remain intact, but greater incentives to dispute when their privileges

(indeed, their enterprises) are being dismantled, which happened in large numbers in the late 1990s. Accordingly, I expect higher rates of disputation where employment is higher in the private economy and lower in state-owned enterprises.

Theories of political opportunity structure and resource mobilization do not flatly contradict each other. Indeed, Snow finds that scholars of political opportunity "do not agree on many specific refutable hypotheses" (Meyer 2004, 133). As we run tests on variables purported to specify resources and opportunity structures, we are more likely to learn of the relative merits of these specifications than we are to learn which theory best explains the outcome (Meyer 2004). Accordingly, we include variables derived from these theories not to test them against one another, but to "link these outcomes to broader structural trends in the Chinese political economy" (Tarrow 2008, 7).

Existing perspectives on Labor Contention in China

Compared to analyses of social movements, studies concerned with foreign direct investment, the influence of unions, and the rule of law are less likely to utilize the framework of contention. The changing structure of foreign investment in China is linked to changes in norms and incentives for the treatment of workers, influencing labor contention through labor conditions (Ho 2003; Gallagher 2005b). Government trade unions (branches of the ACFTU) are able to engage in new forms of unionization and legal aid because unions are dependent on a party-state that is uneasy with economic unrest. The development of legal institutions is related to the development of a dispute resolution mechanism and to popular conceptions of legitimacy (Lee 2007; Gallagher 2005a). Foreign-invested enterprise employment, unions, and legal aid organizations are not simply control variables for labor disputes, but independent variables for labor contention as a whole.

Foreign Direct Investment

Foreign direct investment (FDI) has acted as a catalyst for liberalization, even outside of foreign-invested enterprises (FIEs), because managerial styles tend to converge across ownership types, either through efforts to attract FDI or because of competition with foreign-invested enterprises (Gallagher 2005b, 60). Solinger argues that the relationship between FDI and treatment of workers depends on the source of the FDI – noting that "labor is generally treated significantly better" in enterprises with FDI from "advanced industrial nations" (Solinger 1995,

156). Gallagher explains this, commenting that overseas Chinese investors are concentrated in "labor intensive, export oriented, very cost-sensitive" (Gallagher 2002, 341) industries where exploitation of workers is more severe. Choi makes the link between FDI sourcing and labor contention more explicit, and emphasizes the management styles of expatriate employers also play a role in labor contention (Choi 2003, 233).   Given these arguments, I expect that employment in foreign-invested enterprises will be positively associated with labor disputation, and that this association will be greater for Hong Kong/Macau/Taiwan-invested enterprises than for other FIEs.

Union Structure

Despite its name, structure, and organizational separation from the Chinese Communist Party, even scholars sympathetic to the ACFTU find it difficult to argue that it is a labor union (Taylor and Li 2007). It is seen as bureaucratic, a "transmission belt" beholden to the leadership, ignorant of workers' desires, elitist and anti-migrant in outlook, and as an instrument for the suppression of workers (Taylor and Li 2007, 704). Some scholars argue that the ACFTU has proven effective in areas such as mediation and legal aid (Chen 2003; Liu 2009b). A variety of others, however, see fit to ignore the ACFTU entirely (Wang (1998), as cited by Taylor and Li (2007, 704)), or to otherwise treat it as a nonentity. Blecher argues that the union "didn't so much act on the side of the state or of employers as not act at all" (2008, 265). A Hong Kong-based labor NGO is even more blunt, stating of the ACFTU that "for the vast majority of China's workers, it is an irrelevance" ("Going it Alone" 2009, 42).

Nevertheless, recent work suggests that the union is more powerful than previously thought. Even if it is not truly a union, it is still an element of the party-state that may be sympathetic to workers. By facilitating mediations and arbitrations between businesses and workers, and by leveraging the ACFTU's close affiliations with the state, even a 'union' without the power to call strikes or bargain collectively might aid in the enforcement of labor regulations already on the books. Liu suggests some ways in which styles of unionization can have differing influences on labor contention. At one extreme, nominal "paper unions" are common responses by business to ACFTU demands for the creation of a local union. Similarly, some businesses establish a "boss union" of managers to preempt the creation of a more meddlesome organization (Liu, 16). At the other extreme, "community unions" are active in "organizing, welfare and entertainment, and labor dispute mediation" (Liu, 22), while tight labor markets and stability-minded officials in certain sectors and locales enable "union associations by trade" and trade-level collective bargaining (Liu 2009b, 27). These "union associations by trade" and "community unions" operate

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almost exclusively in the private economy, while "unions in most SOEs have become increasingly irrelevant" (Liu 2009b, 15). Though SOE unions may act "as channels for workers mobilizing moral pressure on management" (Liu 2009b, 15) moral pressure is more likely to result in informal mediation than in legalized disputation. Additionally, the ACFTU's mediation committees are concentrated in SOEs and collective enterprises (Ho 2003, 60).   Though these committees can be bypassed, they still offer a path through which labor contention may be resolved before it is recorded as labor disputation. Liu's coverage of innovative ACFTU organizing did find one segment of the private economy where the "traditional ACFTU organizing model" has taken hold: FIEs (Liu 2009b, 23). However, enterprise mediation committees are far less common in FIEs than in SOEs (Ho 2003, 109). In view of this we tentatively expect that, unlike unionization in other elements of the private economy, unionization in FIEs will have a negative association with labor disputation.

Union Legal Aid

In an environment as formalized and legalistic as an arbitration hearing, the timely provision of legal aid has the potential to lead labor contention towards formalized labor disputation. Unfortunately, though *China Lawyer Yearbook* (*Zhongguo Lushi Nianjian, ZLN)* includes data by province for the number of cases handled through legal aid, these numbers include both civil and criminal cases. If legal aid programs were all administered in a similar fashion, we might conveniently assume that labor cases were the same proportion of the total in each province/year. However, Liebman's survey of China's legal aid system shows that this is far from the case (Liebman 1999). Most legal aid organizations, whether operated by the government, unions, universities, or the All-China Women's Federation, concentrate on civil cases (Liebman 1999, 261). However, these civil cases include a wide variety of types, and different organizations focus on different forms of aid. Making the data even less clear, the term 'legal aid' includes criminal cases where lawyers are appointed by the courts (Liebman 1999, 257).

As a result of these problems with the overall data on legal aid, we focus on a different data series: legal aid provided by the ACFTU and its component unions. Chen (2004) finds that the ACFTU's Shanghai General Trade Union provided legal aid for labor disputes as a means to support workers without opposing the party – even finding that the ACFTU depended on party affiliations for leverage with the state and employers. Though the union's legal aid center had a staff of 400, and sent cases to 80 external lawyers, these resources were not the main strength of the union's legal aid organization (Chen 2004, 35). Instead, Chen found that since many ACFTU

officials hold posts with CCP committees, and since the ACFTU plays a role in formulating local policies, "their interventions in labor disputes within their jurisdictions have to be taken seriously by enterprises" (Chen 2004, 43). Supporting Chen's contention that the ACFTU can be effective, Liu finds that that both overall labor contention and formal labor disputation are ameliorated by union legal aid. That is, contention becomes less necessary when enterprises react to ACFTU legal aid by accepting mediation or complying with labor law (Liu 2009a, 30). Since the ACFTU operates at the intersection of labor issues and legal development, it is reasonable to expect that ACFTU legal aid will be associated with higher rates of labor disputation.

Existing Quantitative Approaches

Though the researchers noted above have argued for the influence of various factors on labor contention, few have tested for the likelihood of labor contention by using statistical methods and data. The exceptions below point out the possibilities for quantitative work on the topic.

Chung et al (2006) explain various movements against the state, using descriptive statistics to cover "CoPSI" (public security incidents), as well as labor disputes, petitions, unofficial religious organizing, religious protest, and crime. This article is probably the best overview of unrest in China. More commonly cited, however, is Tanner's (2004, 139) national-level data series on 'mass incidents', taken from Ministry of Public Security internal statistics. Though useful, this national-level data is difficult to subject to statistical tests.

More narrowly focused on labor contention, Cooke (2008) discusses trends over time in labor disputes. He looks at the increasing use of arbitration rather than mediation. Thireau and Hua (2003) bring data from Shenzhen to the problem, citing a labor bureau survey, letters & visits office records, and arbitration records. As Thireau and Hua note, the fact that requests for arbitration are expressed using legal norms "does not mean that the discussions and solutions provided are mechanistic" (Thireau and Hua 2003, 96). Instead, they are better thought of as tools used by disputants "to express their sense of injustice" (Thireau and Hua 2003, 96). A few authors have employed data on a larger scale. In explaining the legalization of labor disputation, Gallagher uses national-level statistics, disaggregating disputation by enterprise ownership to show the outsize role played by FIEs (Gallagher 2005b, 125). Wallace (2007) utilizes labor disputes, incidents of crime, and petitions as measures of a common 'instability' variable, and uses this variable to predict the likelihood of financial transfers from the central government to the

provinces. Ho (2003) is the only work that takes labor disputes as the dependent variable, drawing upon provincial economic data to predict labor disputes in 2000.

The models these authors employ provide a useful starting point for data analysis, but each model has serious flaws. Wallace's understanding of the "labor disputes" data series is seriously problematic. He describes the data as "a labor dispute series that includes 'organized work stoppage, strikes, sit-ins and demonstrations by workers and retired workers'" (Wallace 2007, 19). This cursory description diverges sharply from other sources, which note that "official statistics on the formal labor dispute resolution process cannot capture the volume of informal protest or 'collective inaction'" (Ho 2003, 84), and argue that "Labor disputes as measured and presented in Chinese statistical information are recordings [only] of formal filings of a labor conflict"(Gallagher 2005a, 55). However, despite the strength of Ho's work on the legal process of labor disputation, the regression model provided is methodologically problematic (Ho 2003, 136). Ho uses an unfamiliar variant of two-stage least squares, addressing multicollinearity by using the residuals from one regression as an independent variable in the next. These problems necessitate adding variables and relying upon different statistical methods than these authors did.

Data

Numbers from China's National Bureau of Statistics (NBS) are questionable, because of insufficient central oversight of provincial statistics bureaus, because of a surfeit of different definitions of terms, and because of institutional weakness in collecting data[5]. Just as problematic are the limitations imposed by data aggregated by province. Because our dependent variable is measured at the province level, there is no feasible way to predict labor disputes with independent variables collected from individual workers in public opinion surveys. Thus, accepting NBS data for labor disputes necessitates using other NBS data, despite the availability of survey data with less

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[5] The foremost issue concerns the incentives for local and provincial data collectors. National data is derived from numbers provided by local and provincial authorities – authorities that may benefit from under- or over-reporting outcomes. In the context of layoff statistics, Solinger cites situations where SOEs will overreport layoffs in search of subsidies (Solinger 2001, 679) or underreport layoffs so as to avoid contributing to "basic livelihood insurance" funds for the unemployed (Solinger 2001, 679). Similarly, year-by-year population statistics are often unreliable because of uneven tracking of migration – an artifact of the *hukou* system of household registration that is "both the basis and product of the authoritarian command economy" (Chan and Zhang 1999). Perhaps most indicative of the NBS's problems are the differences between contemporary and retrospective urbanization figures for the same years. After the 2000 census, the NBS discarded its estimates of urbanization for 1996-1999 and replaced them with guesses based on the 1995 and 2000 census numbers (Chan and Hu 2003, 53).

potential for bias. Using NBS data is necessary because the simplest, most reliable, and most broadly comparable

datasets – answers to questions about contention in cross-national public opinion surveys – are unavailable for

China. Though Minato (2007) reviews a number of surveys with sizable samples in China, most do not include

questions on contention. The exceptions of Asian Barometer and Shi's (1997) Beijing survey were judged to have

too few respondents (18 of 3,183) admitting protest participation, or too much time since the survey was

administered (1989), respectively.

Dependent Variable

Information on the second stage of the labor dispute process, requests for arbitration, is the most useful

measure of labor disputation, and is available from the *Labor Statistical Yearbook* (Zhongguo Laodong Tongji

Nianjian, ZLTN). As described in the literature review, such data on labor contention is very hard to come by at the

national level. The most information on these labor disputes is available at the second stage of disputation, labor

arbitration. This is because the first stage (mediation) is optional and largely confined to SOEs and collectives,

while the third stage (litigation) is only possible after arbitration has been requested (Ho 2003, 60). Data on labor

disputes is available for 31 province-equivalents (including 'autonomous regions' like Xinjiang and centrally-run

municipalities like Beijing) for eight years from 1999 to 2006 (see figure 1). As the data for several independent

variables is missing for the Tibetan Autonomous Region (Xizang), that region is omitted from the analysis.

[insert figure 1 about here]

The *ZLTN* includes data on both individual labor disputes and collective labor disputes, and includes both

the number of disputes and the number of workers involved. In this paper, I choose to focus on the number of

workers involved in collective disputes. There are two reasons for this choice. First, the literature on contentious

politics specifies that contention is "episodic, public, collective interaction"(McAdam et al. 2001, 5). It is difficult

to argue that an individual worker's labor dispute with his or her employer represents interaction that is 'collective' in

any meaningful way. Second, as can be seen in figure 2, the number of individual disputes varies wildly by year.

The sudden drops in 2003 and 2006 would not be particularly problematic if the line in figure 1 were not smoothed

so well by adding collective disputants to the total. Since these data series are drawn from eight different issues of

ZLTN, often with different labels for different years of the same data series, it is thoroughly plausible that some issues of ZLTN are reporting the total number of disputants while others report individual disputants only.

[insert figure 2 about here]

With such ambiguity in the data for individual disputants, an attempt at model-building would be truly unproductive. Accordingly, the dependent variable is operationalized as the number of collective disputants per province per year, as a proportion of the number of workers in that province-year[6]. This operationalization has the unfortunate consequence of conflating contentious labor politics, the ability and desire of workers to take their grievances to quasi-legal fora, and the willingness of labor dispute arbitration committees to accept disputes. As a result, it is necessary to ensure a careful selection of independent variables, controls, and methods.

Independent Variables

The independent variables of interest are the ownership structure of the labor market, union structure of the labor market, median household income, and presence of legal aid. Operationalizing each of these variables requires that we assume the concepts covered by the qualitative literature are roughly equivalent to data series published in *China Statistical Yearbook* (Zhongguo Tongji Nianjian, ZTN), *Labor Statistical Yearbook* (Zhongguo Laodong Tongji Nianjian, ZLTN), *Trade Union Statistical Yearbook* (Zhongguo Gonghui Tongji Nianjian*, ZGTN)*, and *Lawyer Yearbook* (Zhongguo Lushi Nianjian, ZLN). All data referencing employment within a province is specified as a percentage of the provincial labor force.

Labor Market Structure. The ownership structure is assessed using employment figures from the China Statistical Yearbook (ZTN). The China Statistical Yearbook divides employment into 13 different categories, eight of which represent urban enterprises with domestic ownership (see table 1).

[insert table 1 about here]

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[6] Figures on the number of workers in a given province-year are based on NBS statistics. Though tracking of inter-province flows of migrant labor has improved due to the 2000 census, it is unclear whether NBS annual data has improved to the same degree that the decadal census has (Chan and Hu 2003).

Since the managerial behavior in these enterprises is often consistent across categories, I will recategorize enterprise ownership. State-owned enterprises, urban collectives and urban share-holding cooperatives have similar institutional histories, and I refer to them jointly as 'old economy' enterprises (Ho 2003, 101; Choi 2003, 72). Conversely, limited-liability corporations, share-holding corporations, private enterprises, small 'self-employed' enterprises, and joint ventures share a distance from the state and a hard budget constraint, and I refer to these as 'new economy'. As with the data for FIE employment and unionization, all 'new economy' and 'old economy' data is presented as a percentage of the labor force. Annual national figures illustrate the breakdown of disputation by enterprise ownership, as seen in figure 3.

[insert figure 3 about here]

Figure 4 shows the proportion of 'old economy' jobs in each province. Though there is substantial old economy employment is in Xinjiang, the rest of the map reflects patterns of urbanization and marketization. The old socialist economy, historically strongest in the Northeast, is still a significant force in poorer provinces in central and Northwest China. Less substantial amongst the heavily rural provinces of the Southwest, the old economy is also relatively weak in wealthier coastal provinces like Zhejiang and Jiangsu.

[insert figure 4 about here]

Foreign-Invested Enterprise Employment. ZTN employment numbers include separate figures for employment by Hong Kong/Macau/Taiwan foreign-invested enterprises and by other FIEs, on the grounds that the former category is not truly foreign. The literature suggests that the sourcing of FDI has an important relationship to contention. Specifically, it has been argued that FDI sourcing influences contention through managerial styles, and that through the labor-intensiveness of overseas Chinese FDI (Choi 2003; Gallagher 2002). Accordingly, different models will be created using both overall employment by foreign-invested enterprises and these two subcategories. As with the employment data listed above, each form of employment is measured as a percentage of the labor force.

Union Structure. Unionization is operationalized as the percentage of workers employed in enterprises that have

been unionized. This variable uses data from the Labor Statistical Yearbook (*ZLTN*). At a provincial level,

unionization of the labor force is strongest in urbanized areas and areas dependent on the old economy – as in figure

5.

[insert figure 5 about here]

Since the literature leads us to expect that unionization's effects will vary by enterprise ownership, union data will

be broken down by enterprise ownership, so as to better reflect the structure of ACFTU unions within each province.

ZLTN figures come divided by the same categories of enterprise ownership that overall employment data are.

Consequently, it can be recategorized in the same fashion: with separate variables for 'old economy' unions, 'new

economy' unions, and FIE unions. Data on union structure is presented as a percentage of the province's labor force

in unionized enterprises of each ownership type.

Income. The forms of labor contention best captured by data on collective labor disputation are urban, but Gross

Regional Product per capita includes both urban and rural incomes. Since rural output has little to do with the

resources of urban workers, I use urban "median household per capita" income instead. This data series is available

from the China Statistical Yearbook (ZTN). ZTN data series on wages may provide a better reflection of

socioeconomic status than household income does. However, socioeconomic status is not the ideal variable for our

model. Instead, our goal is to find an approximation of the "discretionary resources" (McCarthy and Zald 1977,

1224) available to potential disputants. Consequently, we use the broadest measure of these resources that we can

find – the overall median income of urban households in the province. To compensate for inflation, International

Monetary Fund Consumer Price Index figures (IMF) are used to standardize income figures in constant 2000 yuan.

ACFTU Legal Aid. Three data series on ACFTU legal aid organizations are available for five years (2002-2006)

through the *Union Statistical Yearbook (ZGTN)*. These series list the number of staff, the number of lawyers, and

the number of cases taken by ACFTU legal aid organizations. Since we hope to measure these organizations' ability

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to advise workers, and not only their ability to represent workers in litigation, the number of legal aid staff will be included in the model.

Control Variables

In addition to the independent variables of interest, our model also includes control variables for the structure of the rural economy and for mediation. These are sourced from the same statistical yearbooks as the independent variables. Though the urban employment variables should control for the size of the rural population, the economic structure of rural areas must be controlled for separately. Though labor contention and formalized labor disputation are both predominantly urban affairs, rural workers can and do engage in labor disputes. Rural areas "have less access to legal services, arbitration institutions, and the courts" (Ho 2003, 121) than urban areas, but the *ZLTN* national figures on labor disputes do show some rural disputation (as in figure 1 above). Though the number of rural disputants is small, the number of rural employees varies so much between provinces that controls are necessary. These control variables are created from data series on "Rural Township and Village Enterprise" employment and "Rural Private" employment (ZTN) measured as a percentage of the provincial labor force.

Additionally, it is possible for labor issues within the aegis of the three-stage labor dispute process to be resolved through Enterprise Mediation Committees before reaching the level of labor arbitration. If this phenomenon is restricted to State-owned enterprises, as suggested by Ho (2003), then failing to include the number of mediations would invite omitted-variable bias. Accordingly, five years (2000-2004) of data on the number of enterprise mediations (ZGTN) are included in one of the models.

Methodology

Analysis of this data runs into two problems in quick succession. First, as this is time-series cross-sectional data, we must correct for correlation within groups (provinces), and for the effect of time. Second, we must use methods appropriate for the severe heteroskedasticity found in the dependent variable. Though Green, Yoon and Kim (2001) have suggested that within-group variance should be the sole focus of modeling, this places severe limits on our data analysis, particularly as most of the variance in our sample is cross-sectional. A more popular

method for dealing with such data comes from Beck and Katz (1995). Placing a premium on interpretability, Beck and Katz suggest using Ordinary Least Squares regression with Panel-Corrected Standard Errors. As this approach is relatively simple and exceedingly popular, PCSE seems to be a good starting point (Wilson and Butler 2007). The benefits of the PCSE approach, however, are worthless if the assumptions of the resulting model are utterly discredited by basic diagnostics. The heteroskedasticity present (see appendix entry #1) is dramatic enough that robust standard errors are insufficient. Since the number of collective disputants is bounded at zero, a poisson or negative binomial approach would be the next logical step, but the results proved to be sensitive to slight changes in specification, or else failed to converge entirely. Instead of a poisson or negative binomial model, this paper uses a statistically simpler option - estimating the geometric mean. Following Taagepera (2008, 100), we estimate a multiplicative relationship between the independent variables, rather than an additive one, by taking the natural log of both dependent and independent variables. A constant-elasticity model results, in the form:

$$E[ln\{Y\}] = \beta_0 + \beta_1\,ln(X_1) + \beta_2\,ln(X_2) + \ldots \beta_k\,ln(X_k) + \varepsilon.$$

Additionally, since the model fails a test for autocorrelation, an AR(1) structure will be added. Coefficients are interpreted as elasticities, reflecting a percentage change in the outcome rather than a fixed amount to be added or subtracted. Additionally, the outcome is best interpreted as an estimation of the median, rather than the mean. Though this may seem less statistically conventional than other models, it remains a least squares regression, but with two substantial advantages: it eliminates the problem of heteroskedasticity, and it is perfectly compatible with the use of panel-corrected standard errors. Finally, it is important to note that this paper links a thoroughly individual-level literature to data collected at the provincial level. It is important to avoid the 'ecological fallacy' by remembering that the model predicts provincial effects, not individual ones.

Hypotheses

The model will test the following eight hypotheses derived from the literature review:

Hypothesis 1:

The rate of participation in collective labor disputes will be higher when the proportion of a province's labor force employed in the 'new' economy is higher. It will be lower when the proportion of a province's labor force employed in the 'old' economy is higher.

Hypothesis 2:

Higher median urban household income is associated with higher rates of participation in collective labor disputes.

Hypothesis 3:

Higher rates of employment in foreign invested enterprises is associated with higher rates of participation in collective labor disputes.

Hypothesis 4:

Higher rates of employment in Hong Kong/Macao/Taiwan Invested Enterprises is associated with higher rates of participation in collective labor disputes.

Hypothesis 5:

Higher ACFTU unionization in the old economy is associated with lower rates of participation in collective labor disputes.

Hypothesis 6:

Higher ACFTU unionization in the new economy is associated with higher rates of participation in collective labor disputes.

Hypothesis 7:

Higher ACFTU unionization in foreign-invested enterprises is associated with lower rates of participation in collective labor disputes.

Hypothesis 8:

Higher staffing at ACFTU legal aid organizations is associated with higher rates of participation in collective labor disputes.

Findings

[insert table 2 about here]

The main model, using all variables for which all eight years of data are available, is seen in table 2. The basic results for variables covering the overall structure of the economy do not support our expectations. In fact, contrary to our expectations, we find that a province where old economy employment is 1% higher has a 0.423% greater median number of collective labor disputants. This fails to support our hypothesis that provinces with a more marketized economy will find contention to be more grounded in appeals to law. Though the coefficient for income is positive and significant in a bivariate model, this effect does not persist in multiple regression, failing to support our second hypothesis. Thus, the model above fails to answer one key question: whether we can reduce the structural basis of labor disputation to a matter of resources, or whether we also require details on the nature of enterprise ownership. Without an answer to this question, efforts to link contention to China's "broader structural trends"
(Tarrow 2008, 7) seem unworkable.

Foreign-Invested Enterprise Employment

Unlike the first two hypotheses, hypotheses on FIE employment find firm support in the model above, with positive and significant results. A province where employment by Hong Kong, Macau, or Taiwan-invested enterprises is 1% higher has a 0.468% higher median number of collective labor disputants. For employment derived from other sources of foreign investment, the figure is 0.206%. In addition to testing for the effects of FIEs, it was hoped that this data would determine whether distinguishing between Hong Kong/Macau/Taiwan FIE employment and other FIE employment is useful. We find that the data supports the utility of this distinction[7].

Union Structure

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[7]Though the conventional methods of model comparison – AIC, BIC, and the likelihood-ratio test – were unavailable for panel-corrected standard errors, AR(1) models with and without this distinction allowed the use of all three indicators. Both information criteria, as well as the LR test, led us to reject the assumption that one measure of FIE employment was enough.

First attempts to model the influence of unionization did not yield significant results. However, in accordance with Mingwei Liu's discussion of the differing roles of the ACFTU by ownership sectors of the economy, models were also fit with employment in unionized enterprises disaggregated by ownership type. Contrary to our expectation, we did not find an association between employment in ACFTU-unionized old economy enterprises and the rate of collective labor disputation. Employment in ACFTU-unionized new economy enterprises, on the other hand, is strongly associated with collective labor disputation. A province where employment in ACFTU-organized new economy enterprises is 1% higher has a 0.469% higher rate of collective labor disputation. This finding is in keeping with the expectation as laid out in hypothesis six. Additionally, though we did not find an association between overall employment in unionized FIEs and collective labor disputation, distinguishing between overall FIEs and Hong Kong, Macau, and Taiwan FIEs provides an interesting result. Specifically, a province where the number of workers employed in unionized HK/Macau/Taiwan FIEs is 1% higher has a 0.254% lower rate of collective labor disputation. Though this result does not support hypothesis seven, it does point out the importance of differentiating between different sources of FIE employment. Mediations through ACFTU Committees had the potential to exert a downwards bias on the results for 'Old Economy' and 'Old Economy Unionization'. However, controlling for the number of mediations did not reveal such an effect for either of those variables[8].

ACFTU Legal Aid

[insert table 3 about here]

Though hypotheses on the relevance of union structure to collective labor disputation found substantial support in the regression model, the same cannot be said of the ACFTU's legal aid apparatus. A regression model including the number of legal aid staffers, summarized in table 3, shows a coefficient that is neither positive nor significant. The small number of years for which data is available (5, rather than 8 for most other variables) as well

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[8] Controlling for mediation gives non-significant results for old economy employment, non-China FIE employment, and unionized new economy employment. It also renders the coefficient for new economy employment positive and significant and the coefficient for median household income negative and significant. The results are not presented in detail within this text. By including mediation, the model predicts one form of formalized labor contention while controlling for another. Though such a model serves a diagnostic function, the output does not lend itself to substantive interpretation. See appendix entry #2 for the results.

as the presence of other ACFTU-related variables, might lead to skepticism about this null result: especially since legal aid and disputation show a substantial correlation. However, the coefficient for legal aid drops from significance as soon as variables for income and urban employment are added. In effect, legal aid can explain very little that urbanization and income cannot.

Conclusions

The findings above show a wide variety of results: some fascinating, a few ambiguous, and some uninteresting. Further, some of the results have important implications for how we engage with issues of labor contention in China. In addition to the substantive relevance of the findings, these results also indicate the potential of time-series cross-sectional datasets using Chinese state statistics.

Results on FIE employment and ACFTU unionization warrant a brief discussion of their relevance to the field. Though FIEs were associated with labor disputation regardless of whether they were disaggregated by source of investment, an attempt to model unionization as a single variable would have flatly failed. In the case of unionization, dramatically different effects were found depending on which segment of the economy was the target of unionization. The persistence of unionization effects is particularly surprising given scholarly understandings that the ACFTU is utterly ineffectual (Taylor and Li 2007; Solinger 2009). That labor disputation is so dramatically higher in provinces with a larger degree of new economy unionization is surprising, but raises as many questions as it answers. What mechanisms allow unionization in the new economy to be associated with disputation? Is this result an artifact of the labor disputation process, or does it represent broader outcomes of contention in labor politics? Can similar findings be seen at the micro level, predicting individual behavior, rather than rates at the provincial level? The negative association between labor disputation and employment in unionized Hong Kong/Macau/Taiwan FIEs is just as puzzling, particularly since the results are so utterly dissimilar from other FIE employment. While it is quite possible that unionized FIEs act to mediate potential disputes before they become formalized, why would this vary by the source of the foreign investment?

The significance of overall FIE employment, and in particular of Hong Kong/Macau/Taiwan FIE employment, is far less surprising than the conclusions about unionization. These conclusions show that, in terms of labor politics, it is difficult to separate the recent history of China's marketization from the recent history of foreign

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investment. The substantial difference between models with and without the disaggregation of FIE employment supports the argument that foreign investment reflects many forces exerted upon the Chinese labor market, instead of only one (Gallagher 2005b). Despite this finding, limitations in the model prevent us from answering a number of important questions about labor contention and foreign investment. Is the association between FIE employment and labor disputation attributable to disputation within the FIEs in question? Or do foreign-invested enterprises function as catalysts for contention in the broader provincial economy (Gallagher 2005b)? Finally, does the sourcing of foreign investment directly influence the nature of contention through managerial style (Choi 2003)? Or are our results due to a tendency of Hong Kong/Macau/Taiwan-invested firms to be more labor-intensive than others?

Beyond the substantive conclusions, the data on which these findings are based could be improved dramatically. Even if it remains politically difficult to obtain non-official data on contention, unionization, and enterprise ownership, province-level estimates for politically innocuous subjects like income and urbanization would be exceedingly helpful, allowing control variables that are subject to fewer questions about reliability. Alternatively, breakdowns of province-level dispute numbers by enterprise ownership would allow greater precision, and would allow conclusions about enterprise types rather than provinces. Other incremental improvements, such as data on labor legal aid rather than ACFTU legal aid, or data utilizing Liu's (2009a) typology of unions, would allow us to use fewer assumptions during model-building.

The data and methods that these results rely on, even if flawed, offer opportunities for quantitative analysis that we do not see elsewhere. Hopefully, future work can use trusted data such as surveys and interviews to gauge the reliability of official statistics in a rigorous way. Ideally, the quality of measurements would be a part of the model. Yet when the qualitative literature and state statistics support each other as thoroughly as they do here, such concerns may be muted. This paper has suggested, however, that future efforts to understand labor contention in China, whether qualitative or quantitative, will require sustained attention to the sources of foreign investment and the varieties of ACFTU unionization.

Appendix 1 - Methodology

The statistical methods used in this paper are less conventional than is usual. Though some of the choices, like the use of Panel-Corrected Standard Errors, or the use of an AR(1) model, are relatively standard, taking the natural log of both sides is far less so. The purpose of this appendix is to illustrate why this method is necessary, and to demonstrate that it is sufficient to counter the problems presented by the data.

We reject a fixed-effects model on the grounds that most of the variance in the dependent variable is cross-sectional, and many of the independent variables of interest change slowly, if at all, in the eight years for which we have data. To be more specific, the standard deviation of the dependent variable is 1.116. Within groups (provinces), the figure is 0.677, while between groups the figure is 0.901.

The severe heteroskedasticity referred to in the text is easily seen in a histogram. For greater precision, a quantile plot is also provided.
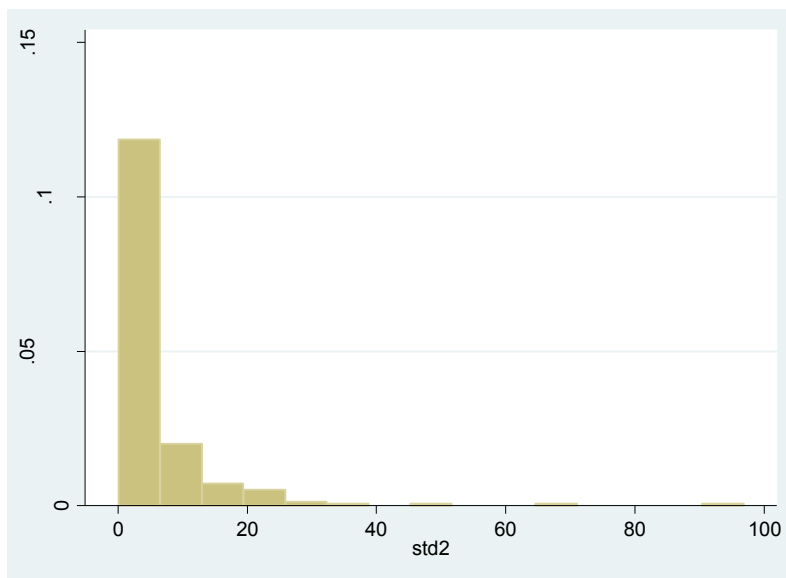
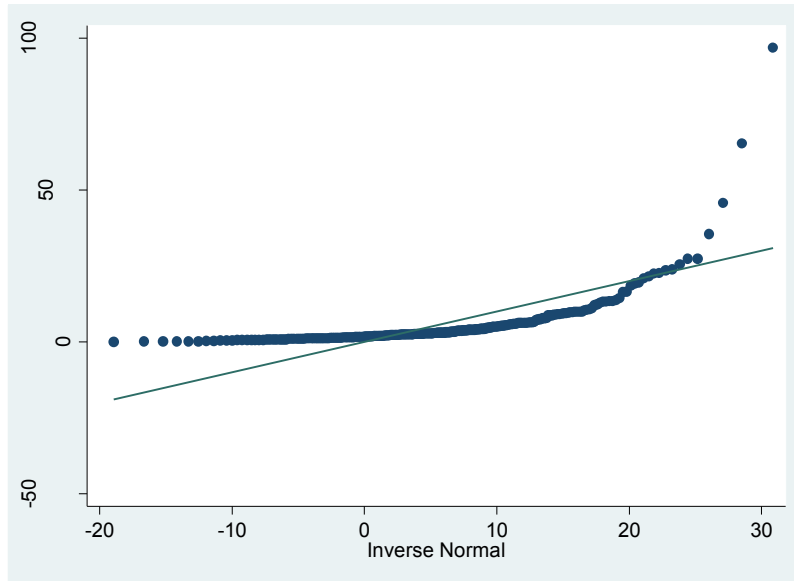Figure A1. Histogram of the dependent variable, prior to log transformation.

Figure A2. Quantile plot of the dependent variable, prior to log transformation.

As can easily be seen in the figures above, the dependent variable is strongly non-normal. This type of heteroskedasticity, in data where most of the variance is cross-sectional, often reflects unexplained province-level effects. However, figure A3 – a quantile plot of the residuals after a regression with province dummies – shows that the heteroskedasticity persists even after allowing for such effects. While the heteroskedasticity is quite severe, its presence is unsurprising: such results are common with 'count data' where large outcomes are rare.
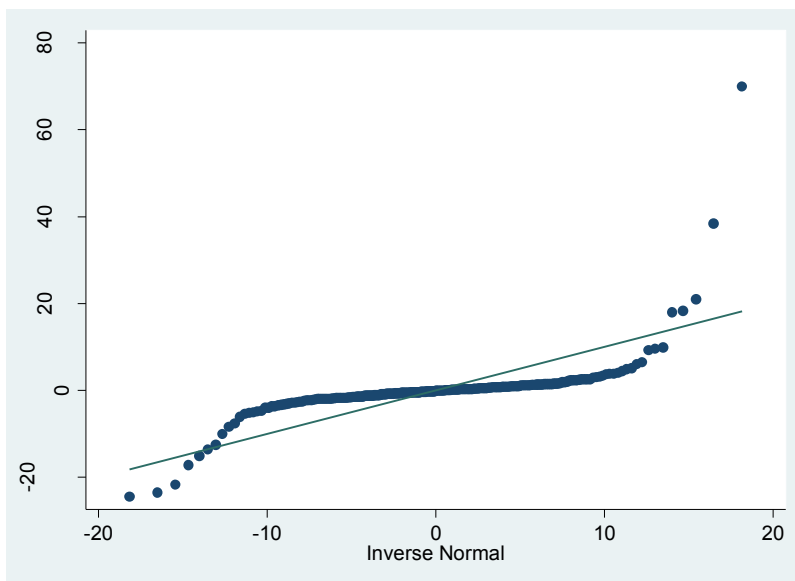
Figure A3. Quantile plot of the dependent variable, with fixed effects.

Compensation for autocorrelation is a necessary aspect of working with panel data but, as Wilson and Butler (2007) note, it is also necessary to run tests before including a lagged dependent variable. A Wooldridge test for autocorrelation fails, with p=0.0471. However, inclusion of a lagged dependent variable only exacerbates the problem, bringing the Wooldridge test to p=0.000. As a result of this test, we reject the lagged dependent variable in favor of an AR(1) autocorrelation structure.

Log-transforming the dependent variable renders the residuals approximately normal, as can be seen in figure A4, but the resulting model shows a poor fit to the functional form of the independent variables, as seen in figure A5.
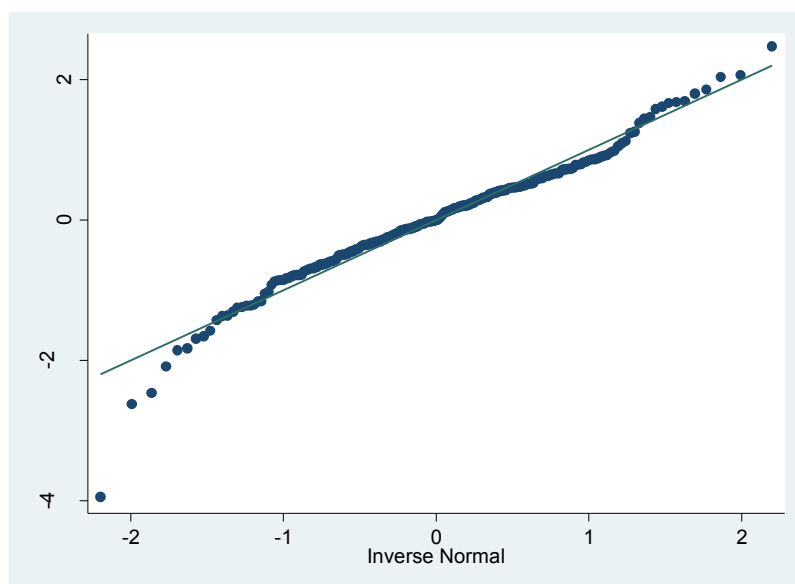

Figure A4. Quantile plot of the residuals of the model, after log transformation of the dependent variable. Approximately normal.
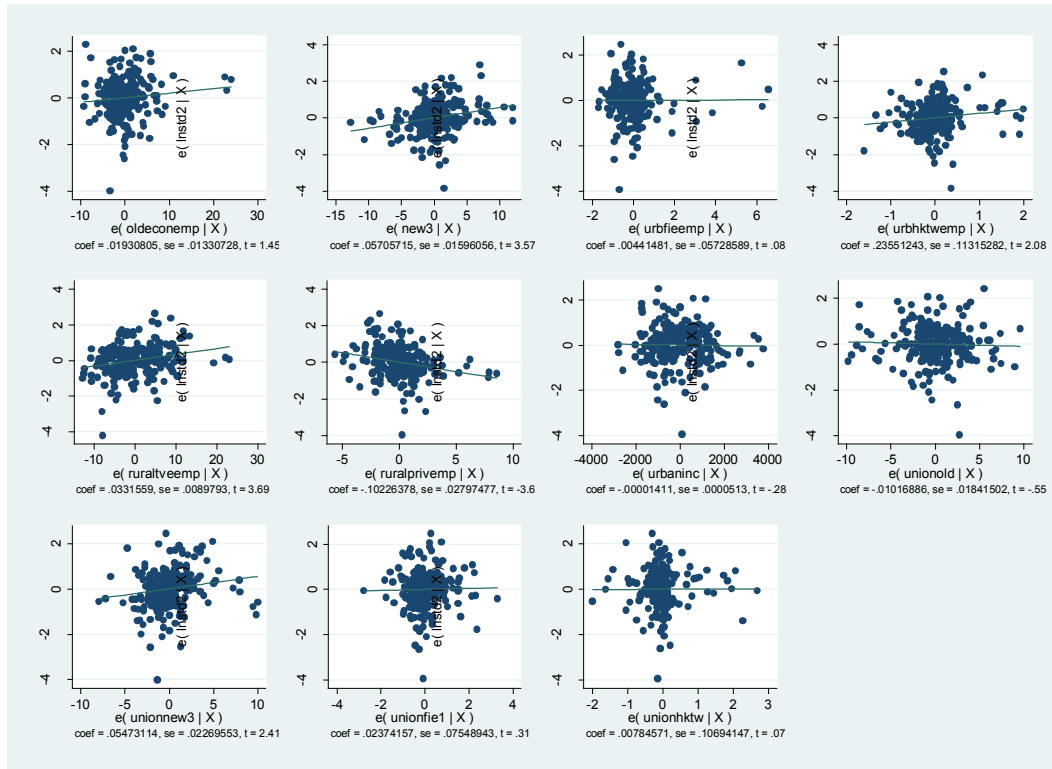
Figure A5. Added-variable plots for model with log-transformed dependent variable but untransformed independent variables. Note the tight horizontal clustering.

Finally, after a transformation of the independent variables, the residuals remain normal (figure A6), but the functional form of the added-variables plot indicates a far better fit (figure A7).
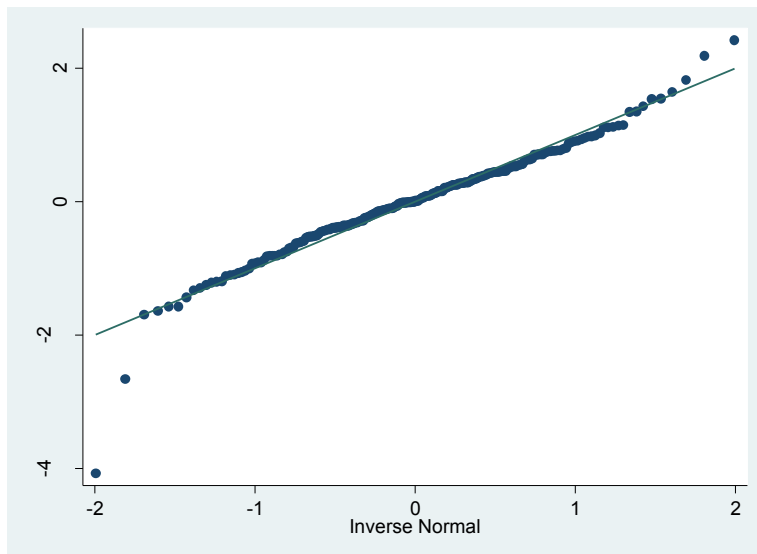

Figure A6. Quantile plot of residuals. Residuals remain approximately normal.
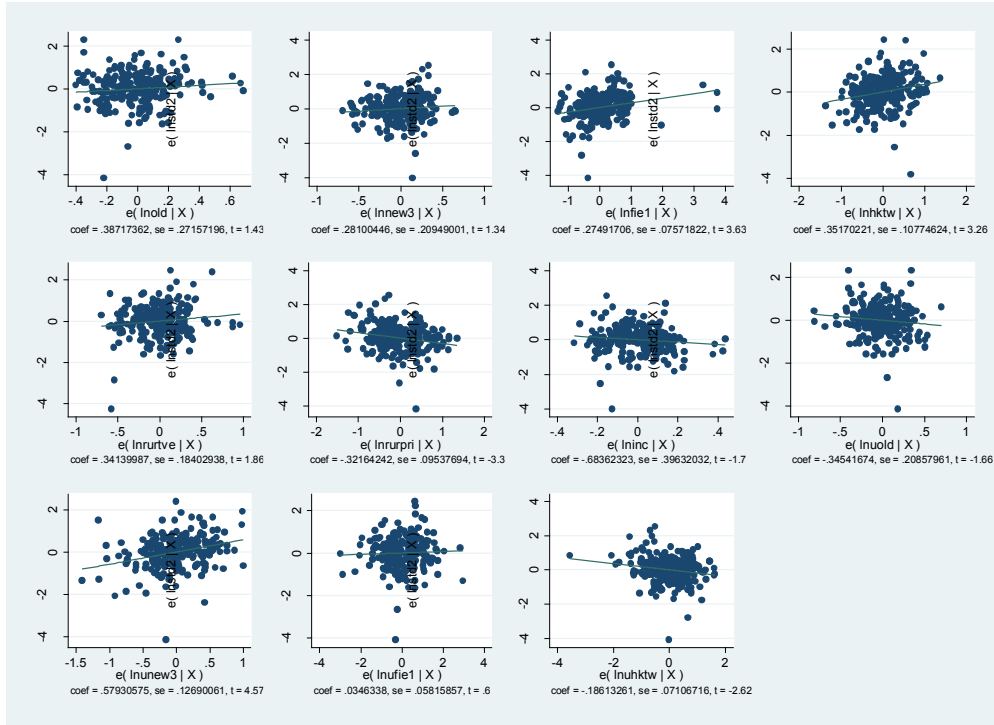
Figure A7. Added-variable plots for the final model. Note the wider dispersion vs. fig. A5.

Appendix 2 – Mediations

Second Model - Controlling for Mediation

	Coefficient	Std. Error
'Old Economy' Employment	0.0618	(0.393)
'New Economy' Employment	0.676**	(0.284)
Non-China FIE Employment	0.170	(0.119)
HK/Macao/Taiwan FIE Employment	0.517***	(0.143)
Rural Private Employment	0.562*	(0.334)
Rural TVE Employment	-0.342**	(0.145)
Median Urban Household Income	-1.344**	(0.595)
'Old Economy' Unionized Employment	-0.0750	(0.287)
'New Economy' Unionized Employment	0.195	(0.212)
Non-China FIE Unionized Employment	0.0720	(0.0612)
HK/Macao/Taiwan FIE Unionized Employment	-0.283***	(0.0780)
Mediations	0.208*	(0.123)
Constant	10.12	(6.342)
Observations	145	
R-squared	0.460	
Number of Regions	30	

* p<.1   ** p<.05   *** p<.01

Figure A8. Regression results, after controlling for mediations.

Regression results including the number of mediations conducted, can be seen in figure A8. Note that mediations themselves are positively associated with the labor disputes that they (along with arbitrations and litigation) constitute. Contrary to our expectation, we see that 'Old Economy' employment's coefficient is lower than in the original model, and is no longer significant. Unionized 'Old Economy' employment has a higher coefficient than before, but remains insignificant.
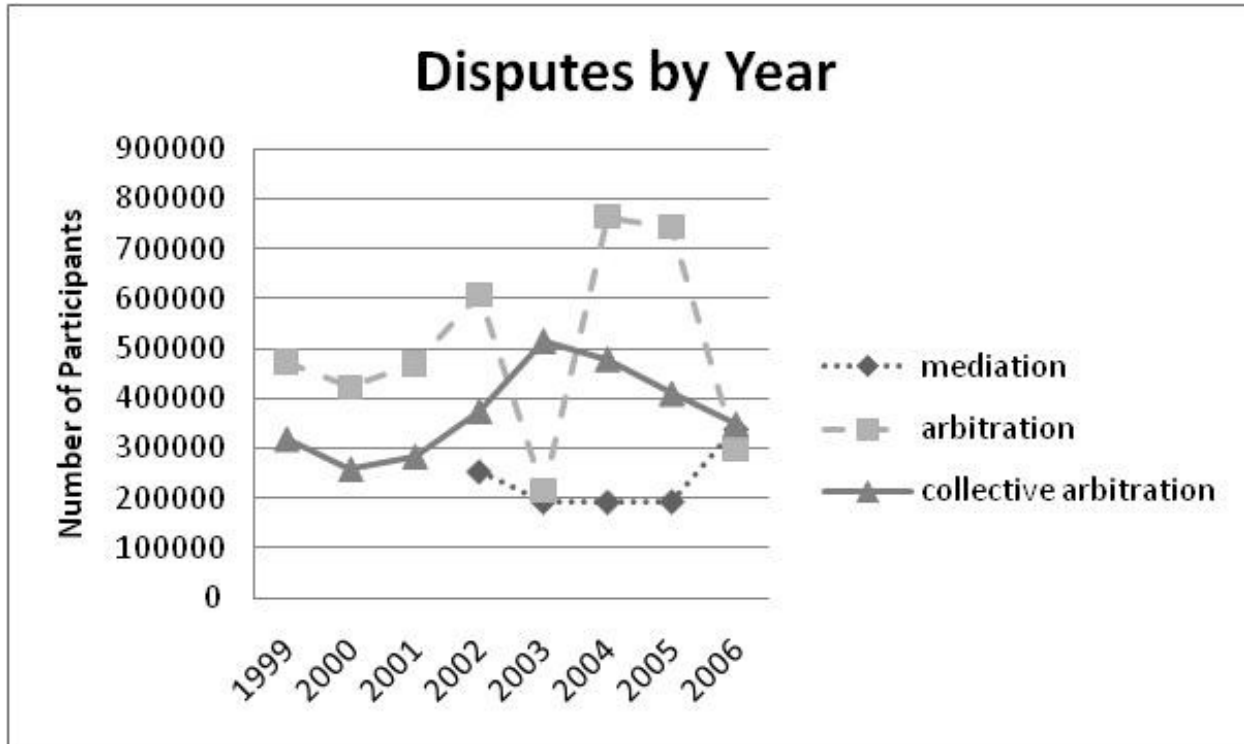
Figures and Tables

Figure 1. Mediations, arbitrations, and collective arbitration totals by year. (ZLTN)
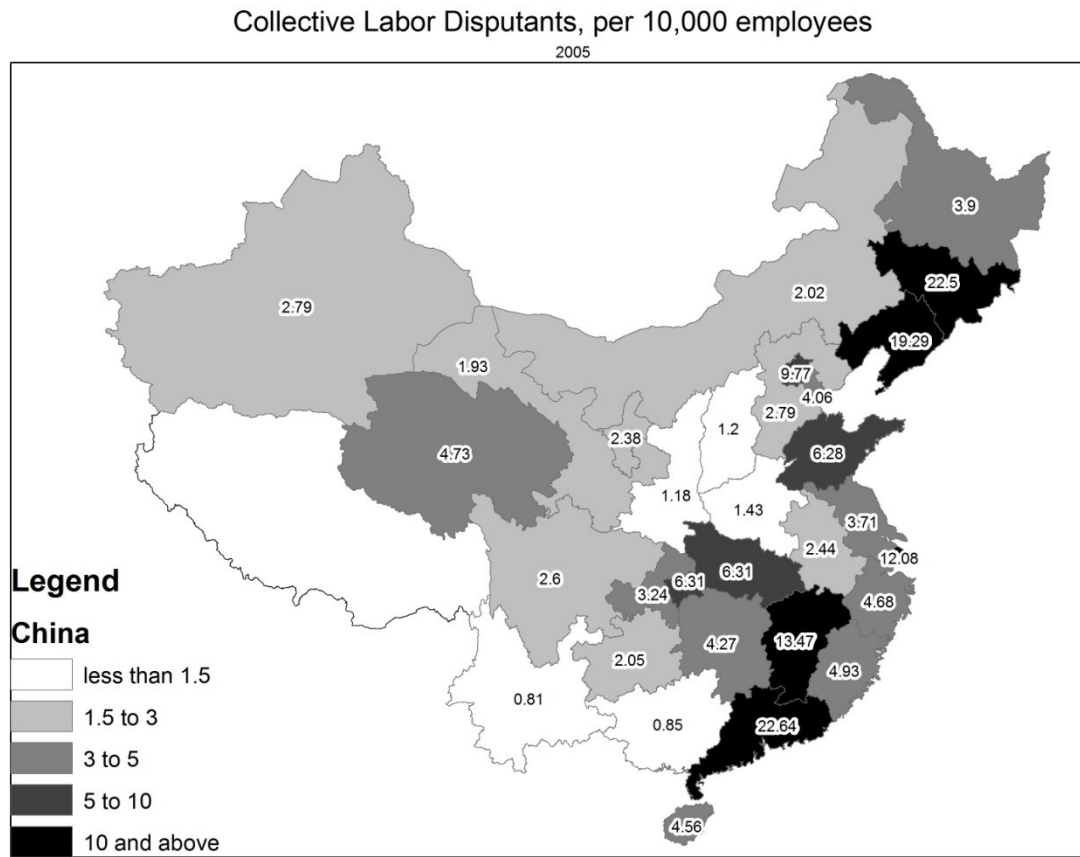
Figure 2. Collective Labor Disputants per 10,000 employees, by province. Figures from Tibet are excluded. (ZLTN)

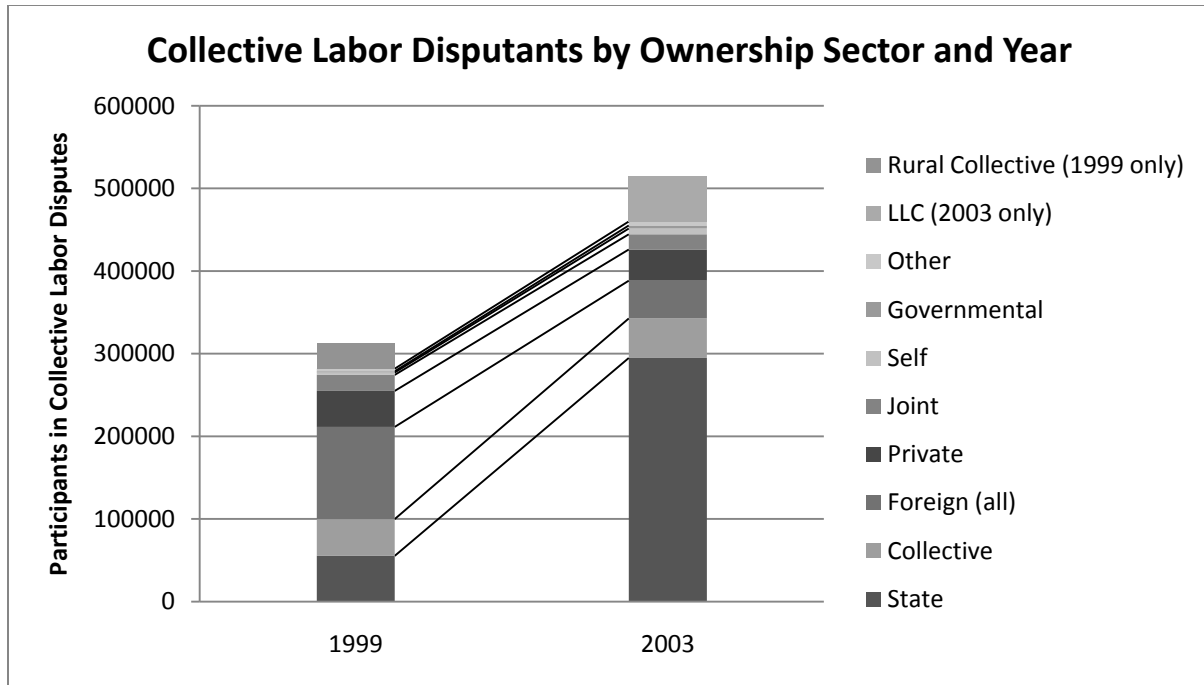Figure 3. Collective Labor Disputants by Sector and Year – National data (ZLTN)

Urban Old Economy Employees, as a percentage of the Labor Force

Figure 4. Urban employment in the old economy, as a percentage of the overall labor force. provincial level data (ZLTN).

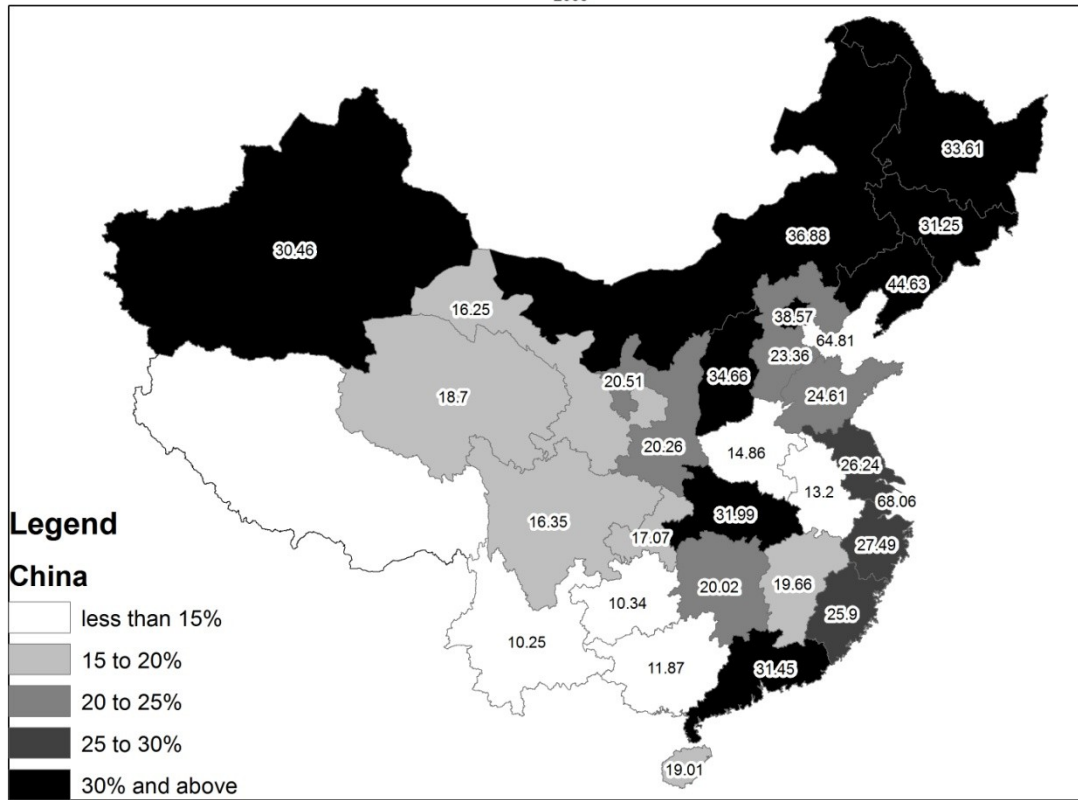Employment in Unionized Enterprises, as a percentage of the Labor Force

2005

Figure 5. Employment in Unionized Enterprises, by Province, as a percentage of the Labor Force (ZLTN).

Name	New Category
State-Owned Enterprises Collective-Owned Share-holding	"Old Economy"
Joint-owned Limited Liability Corporation Share-holding Corporation Private Enterprise Urban Self-employed	"New Economy"
HK/Macao/Taiwan-invested non HK/Macao/Taiwan-invested	"FIE"
Rural TVE Rural Private Rural Self-employed	Controls

Table 1. Categories of employment in "China Statistical Yearbook" (ZTN), before and after recategorization.

Main Model - Hypotheses 1-7

	Coefficient	Std. Error
'Old Economy' Employment	0.423*	(0.245)
'New Economy' Employment	0.222	(0.212)
Non-China FIE Employment	0.206**	(0.0923)
HK/Macao/Taiwan FIE Employment	0.468***	(0.106)
Rural Private Employment	-0.269**	(0.106)
Rural TVE Employment	0.348	(0.236)
Median Urban Household Income	-0.549	(0.390)
'Old Economy' Unionized Employment	-0.321	(0.241)
'New Economy' Unionized Employment	0.469***	(0.123)
Non-China FIE Unionized Employment	0.0806	(0.0611)
HK/Macao/Taiwan FIE Unionized Employment	-0.254***	(0.0569)
Constant	3.917	(3.931)
Observations	232	
R-squared	0.399	
Number of Regions	30	

* p<.1   ** p<.05   *** p<.01

Table 2. Regression results from the loglinear model, using Panel-Corrected Standard Errors and an AR(1)

autocorrelation structure.

Third Model - With ACFTU Legal Aid Staff

	Coefficient	Std. Error
'Old Economy' Employment	0.143	(0.373)
'New Economy' Employment	0.676**	(0.275)
Non-China FIE Employment	0.211*	(0.116)
HK/Macao/Taiwan FIE Employment	0.453***	(0.132)
Rural Private Employment	-0.401***	(0.143)
Rural TVE Employment	0.627**	(0.295)
Median Urban Household Income	-1.074*	(0.561)
'Old Economy' Unionized Employment	-0.0730	(0.268)
'New Economy' Unionized Employment	0.199	(0.196)
Non-China FIE Unionized Employment	0.103**	(0.0505)
HK/Macao/Taiwan FIE Unionized Employment	-0.264***	(0.0715)
ACFTU Legal Aid Staff	-0.00904	(0.127)
Constant	7.546	(5.765)
Observations	145	
R-squared	0.455	
Number of Regions	30	

* p<.1   ** p<.05   *** p<.01

Table 3. Regression results from the loglinear model, using Panel-Corrected Standard Errors and an AR(1)

autocorrelation structure. Includes ACFTU legal aid staff per province.

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