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# Organization size and economic stratification in urban China: 1996–2006

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## Abstract

A well-documented finding in social stratification research is that employees in larger work organizations earn more than those in smaller ones. This research first extends the institutional context of this topic from the typical market economy to transitional China. Mainly using two sets of nationally representative survey data, the research examines the changing pattern of size-earnings relation from 1996 to 2006. Results show that a significant size-earnings premium also exists in urban China and that it doubled during this 10-year period. Moreover, individual and organizational characteristics played contrasting roles in explaining the observed size-earnings relationship. Specifically, individual characteristics had no impact on the size effect in 1996 but did reduce it in 2006; on the contrary, organizational characteristics partly explain the size effect in 1996 but not in 2006. These findings are explained as the results of increasing labor mobility and a declining redistributive mechanism during this period, thus suggesting the development of China's urban labor market.

**Keywords:** Organization size, Stratification

## Background

The “new structuralism” in social stratification research highlights the role of structure in the status attainment process. Work organization is one structural factor, and it is even thought to link the “macro” and “micro” dimensions of inequality and play the central role in bridging broad structure and specific socioeconomic achievement. Of all organizational characteristics, size is a fundamental one, and it is also the most important correlate of diversity in organizational structures. Previous studies focusing on size-earnings relation typically have found that employees of larger organizations earn more than those who work for smaller employers, and many propositions have been made to explain this relationship.

However, these findings and general explanations have typically only been pertinent to market economies. Whether this specialized knowledge on size-earnings relation also applies to societies operating within a different economic system is not clear yet, although cross-national and cross-temporal examinations have suggested this relation depends on institutional or cultural context and economic change. This research attempts to extend the analysis on the relationship between organization size and economic stratification into urban China, the second-largest national economy in the world, and an economy quickly changing from a redistributive system to a market-oriented system.

In fact, students of Chinese stratification research emphasize the role of the work organization, or *danwei*—a Chinese character equivalent to work unit or workplace. However, two limitations are obvious. One is that what has been routinely focused on are three traditional attributes of work organizations, i.e., ownership, rank, and type, whereas organization size has been almost totally neglected. The other one is that previous empirical findings have been generated from datasets that were collected primarily before the mid-1990s and thus cannot reflect the most recent and dramatic changes of China's urban labor market.

Centered on the size-earnings relationship, the present study explores three questions. First, does organization size matter for economic stratification in urban China's context? Second, how such size effect can be explained by individual as well as organizational characteristics? Third, has there been any temporal change for the answers to the first two questions in accordance with China's dramatic change since the mid-1990s? Because of the rarity of highly comparable datasets, this research observes just two time points: 1996 and 2006, aiming to provide a preliminary depiction of ten years of change.<sup>1</sup>

The remainder of this article is as follows. Previous studies on the relationship between organization size and economic stratification are first reviewed. Limitations of the general literature and the deficiencies of organization-based stratification research in China's context are then identified, which leads to the three research questions that are answered in the study. Subsequently, two survey datasets are introduced, followed by a description of the variables and specification of the models. Empirical results and corresponding analysis are presented in detail in the following section. Finally, I conclude the research by summarizing its main findings and discussing its implications and limitations.

### **Organization size and economic stratification**

In stratification and mobility research, the status attainment paradigm focused almost exclusively on the individual determinants of socioeconomic achievement, until the "new structuralism" maintained that structure is both more important than and logically prior to individual attainment (Kalleberg and Sørensen 1979). Empirical research from such a "structural" perspective showed that individual achievement is a function of many structural factors, such as class, economic sector, or organization. Baron and Bielby (1980) further theorized that work is structured at five levels: societal, institutional, organizational, role, and individual, and furthermore, organizations link the "macro" and "micro" dimensions of inequality and play the central role in bridging broad structure and the specific status attainment process.

Of all organizational characteristics, size is a fundamental one, and it is also the most important correlate of diversity in organizational structures. Based on earlier theoretical and empirical work, Child (1973) established the substantive and consistent correlation between organizational size and measures of six important dimensions of organizations across all five datasets he used. Furthermore, Simmel (1964) once argued for a "quantitative determination of the group" (p. 87) whereby structural differences among groups are produced by "mere numerical differences" (p. 97). This offers a basis for the consequences of the sheer number of employees, a routine measurement of organization size.

Previous empirical research has typically focused on size-wages or size-earnings relation. The well-documented finding of such research was that employees of larger organizations earn more than those who work for smaller employers. Actually, the positive relationship between firm size and employee wages was documented as early as 1911 (Oi and Idson 1999). Such a “main effect” of size-earnings premium is so ineradicable that even controlling for various kinds of mediating factors, which are correlated with both size and earnings, cannot fully remove it. Following the pioneering work of “bringing the boss back in” by Stolzenberg (1978), a few scholars paid close attention to the “moderated-effect” of size on the relationship between individual or occupational characteristics and earnings attainment. For example, Sakamoto and Chen (1991) challenged the conventional sociological wisdom that, for white male employees in the USA, returns to education are substantially greater in larger establishments. Based on a much larger dataset and a more rigorous methodology than had been used before, they found that the effect of schooling does not vary systematically by establishment size. In addition, Villemez and Bridges (1988) employed a matched employer-employee dataset to investigate the linkage between organizational size and individual earnings and found the situation to be quite complicated, rather than straightforward. According to their findings, size effect varies by gender, occupation, and industry group and is differentially mediated by internal labor markets, literacy requirements, and unionization.

Others extended the analysis on size-earnings relation by investigating the temporal change or cross-national variation. For example, different from findings by Idson and Oi (1999) that there was a large increase in the size-wage effect in manufacturing industry through the 1960s and 1980s in the USA, Hollister (2004) discovered a significant decline of the size-wage effect between 1988 and 2003, an apparent reversal of the earlier trend. The author attributed this declining trend to a number of changes in the US economy in the past few decades, such as shifts in organizational structure and, particularly, the decline of internal labor markets. Using data from the USA, Japan, and Norway, Kalleberg and Van Buren (1992) conducted a cross-national analysis of the size-earnings relation and found it to be especially pronounced and persistent in the USA. According to the authors, the smaller size-earnings differences in Norway could be explained by the egalitarian values and the centralized collective bargaining system, and the cultural values of social harmony and solidarity in Japan may also tend to reduce size-earnings differences.

Since the economist Lester (1967) stated that “size-of-establishment differentials in total compensation are too significant to disregard in wage theory, but they have yet to be satisfactorily treated in theoretical terms” (p. 67), considerable headway has been made in explaining why larger organizations pay their employees higher wages. However, despite the vast amount of research on the size-earnings relation, there still lacks an agreed-upon explanation for its existence. Scholars have proposed various hypotheses to account for such relationship, many of which can be grouped into four general explanations: market environment, labor force quality or the labor-sorting process, labor-management relations, and the structure of employment relations. These are briefly summarized as follows.<sup>2</sup>

The most common explanation is that large firms hold monopolistic positions in their product markets that allow them to earn excess rent, some of which is shared with workers through higher wages. As industries are rough proxies for product

markets, industry-based differences may lead to size-earnings correlation. This may happen in two ways: certain industries tend to have both larger firms and higher wages, and firm size may matter only within certain industries. Size-earnings differential may also be due to local labor market conditions. For example, small firms may tend to be in smaller communities with fewer alternative job options and therefore maintain low wages. In this situation, size-of-organization differentials could really reflect size-of-place differences.

Neoclassical economists suggest that employees of larger organizations earn more because they are of higher quality than those employed by smaller organizations. Sorting and selection mechanisms channel higher quality workers with higher levels of both measured and unmeasured human capital to larger organizations.

Size-earnings differential may be due to the higher rate of unionization in large firms and unions' tendency to raise wages. In addition, larger non-unionized organizations are generally thought to pay their employees higher wages in order to avoid unionization in the future (the so-called "union threat effect"). Considering internal equity pressures created by unions, Kalleberg and Van Buren (1992) generalized the unionization explanation to hypothesize that larger organizations have more problematic labor-management relations and that higher wages are used to help alleviate the negative consequences of conflict.

Previous research has found a strong correlation between size and a wide range of organizational practices, including horizontal and vertical differentiation, formalization, administrative intensity, internal labor markets, provision of training, etc. Among them, the most direct connection to size-earnings differential is internal labor market, which is used to describe structured employment relationships that include internal promotion along established job ladders and commitment to long-term employment. Another reason for why large employers pay more to workers of the same quality is that they are less able to judge accurately the productivity of their employees (so-called "monitoring costs").

### **Criticism and research questions**

One notable limitation of previous research on size-earnings relation, as introduced above, is that the typical findings and general explanations are only pertinent to societies operating in market economies. Thus, whether the specialized knowledge that the academic community has accumulated in the past decades also applies to societies operating in different economic systems is not yet clear. This research is an attempt to extend the analysis into China, the second-largest national economy in the world, and an economy that is quickly changing from a redistributive system to a market-oriented system.

To be fair, students of Chinese stratification and mobility research do emphasize the role of work units or *danwei* (Walder 1986). For example, Lin and Bian (1991) derived a status attainment model for urban Chinese by paying close attention to the significance of work sector status as a destination variable and concluded that "social mobility becomes a matter not of getting a better job or making more money but rather of getting into the right work units" (p. 659). In the traditional *danwei* system in China, a work unit's structural position in the redistributive hierarchy is mainly indicated by three attributes: ownership, especially for the dichotomy of state owned vs. non-state

owned; rank, either in the bureaucratic hierarchy in general or in the budgetary structure in particular; and type, which differentiates organization's strategic function (Bian 1994).

Empirical data, which were collected at Tianjin city from the 1980s to the early 1990s, consistently validated the danwei-based stratification regime in urban China. For example, Bian (1994)'s descriptive statistics demonstrated that state-sector employees have a higher status than collective (and also private) employees in all six variables that measure characteristics of the labor force. The strongly positive association between the state-owned work unit and the individual worker's salary, bonus, and total income was also warranted in the multiple regression analysis (Walder 1990). Not only was the advantage of state-owned work units identified, but the danwei's (budgetary) rank also manifested its independent effect. The higher the budgetary rank of the controlling government unit, the more likely workplaces are to offer a series of social services (Walder 1992). In addition, a higher work unit rank was found to be significantly associated with a higher level of income from 1978 to 1993 (Bian and Logan 1996). Subsequent analysis using more representative data found that, on the one hand, the relationship between workers and their work units has ironically strengthened since the late 1980s; however, on the other hand, the redistributive influence, represented by work unit bureaucratic rank and state ownership, shows some tendency toward decline (Wang and Wang 2005; Wu 2002; Zhou 2000). The most recent study by Bian and his colleagues found that danwei-based stratification has weakened along with the development of market economy (Bian et al. 2006).

There are two limitations of these studies on danwei-based stratification in urban China. One is that what are routinely focused on are three traditional attributes of work organizations, i.e., ownership, rank, and type. Although firm's or danwei's profitability and industry classifications have been identified as new strong predictors for workers' earnings (Hao and Li 2006; Xie and Wu 2008), organization size has been almost totally neglected by researchers.<sup>3</sup> The other limitation is that the empirical findings have been based on datasets that were collected primarily before the mid-1990s, except for a few studies (Bian et al. 2006; Xie and Wu 2008). Clearly, this cannot reflect the most recent and dramatic changes of China's urban labor market. It is well known that, due to the large-scale privatization of state-owned enterprises (SOEs) and the influx of rural migrants into cities, the landscape of stratification and inequality in urban China has changed significantly since the mid-1990s. In addition, without an analysis of temporal change, we are left in the dark about whether and how work units maintain their role in stratification processes at the end of the second 30-year transition of the People's Republic of China (PRC).

Centered on the size-earnings relationship, this study explores three questions. First, does organization size matter for economic stratification in urban China's context? Although some studies have also examined the relationship between organization size and non-economic job rewards, such as fringe benefits, promotions, and autonomy, (e.g., Kalleberg and Van Buren 1996), this research mainly focuses on economic stratification indicated by earnings. Second, how can such a size effect be explained by individual as well as organizational characteristics? Due to data limitations in China, it is not possible to take into account as many organizational variables as various explanations suggest should be,<sup>4</sup> but at least the size effect can be examined by controlling

three organizational characteristics that are routinely emphasized by the existing danwei literature, i.e., ownership, rank, and type. Third, is there any temporal change for the answers to the first two questions, during China's dramatic change since the mid-1990s? Because of the rarity of highly comparable datasets, this research mainly compares two time points: 1996 and 2006, aiming to provide a preliminary depiction on ten years of change.

### **Data, variables and methods**

Two datasets are analyzed in this research. One is the 1996 survey, *Life Histories and Social Change in Contemporary China*, and the other is the 2006 survey, *Chinese General Social Survey*.<sup>5</sup> Both datasets are nationally representative and use similar multi-stage probability sampling procedures. Given the focus of this research, only the urban samples were analyzed. There are two basic reasons for this. First, due to the sharp rural-urban disparity created by the household registration (or hukou) system and other institutions, urban China rather than the entire country is the more appropriate social entity to compare to other industrialized societies. Second, China's danwei system only applies to cities/towns but not villages; thus, previous research on organization-based stratification in China is only pertinent to urban society.

Following the traditional approach in the research field of size-earnings relation, the urban samples of both datasets were further restricted in two ways. First, respondents must have been employed when they were interviewed during the data collection period for the two surveys. This is simply because the research interest of this study is in whether and how workers' earnings are determined by the size of the organization with which they are affiliated. Second, only employees but not employers or self-employed workers were analyzed. This is because the relationship between employers' or small business owners' earnings and the size of organization they operate is not as theoretically interesting as it is for employees. According to these two criteria, it is clear that the research population for the topic of size-earnings relation is actually wage earners.

Most previous research also restricts the analysis to organizations in the private sector, as in the public sector the notion of "size" is often ambiguous, and the boundaries of "organization" are often vague (see Brown and Medoff 1989). The situation is somewhat different in urban China's context. That is, the public sector accounts for a significant proportion of employment, even after several rounds of reform by the central government on this sector.<sup>6</sup> If the entire public sector were excluded from analysis, the research results might project very limited, or even misleading, information in terms of our understanding of China's urban labor market. Furthermore, every non-government danwei in the public sector in China is an independent entity in terms of financial accounting as well as legal representative (see Bian 1994), so its organizational boundaries are quite clear. Therefore, it is quite reasonable to retain employees in the non-government danwei in the analysis. As for government employees, they could have simply been excluded from the study. However, since the sample size has already been greatly reduced after restricting the research population as wage earners, the decision to include them in the analysis was made to avoid further truncation of the sample<sup>7</sup>. Therefore, government employees, along with employees in the non-government danwei, will be retained in the analysis.



The two datasets include comparable individual-level as well as organizational-level variables. Organization size serves as the key explanatory variable of this research. Specifically, it is defined as employment size, measured by the number of employees of the work organization. Information on ownership and type of work units was collected by the two surveys in slightly different ways, but it did not hinder classifying work units into four ownership types: state agencies, SOEs, collective enterprises, and private enterprises. The rank of the work unit was also asked about in different ways in the two surveys. Although quite similar scales were used to indicate administrative rank, i.e., an array of village or community level, township level, county level, prefecture level, province level, and central level, the 1996 survey asked respondents to report the rank of the work unit where he/she worked, but the 2006 survey asked respondents to report the rank of the work unit that supervised his/her own work unit. The two measures are not exactly the same, but they are equivalent in both conceptual and practical senses. Conceptually, both of them measure organizational positions in the redistributive hierarchy. Practically, both of them have been used in empirical studies. Therefore, the two measures for organizational rank in the two datasets are comparable in substantive meaning. Following the literature, the variable of rank is treated as continuous, ranging from 0 to 6, where 0 refers to “no rank,” and 6 to “central-level.”

In addition to these two variables at the organizational level, a set of individual-level covariates are used: sex, marital status, education, work experience, occupation, hukou, and Chinese Communist Party (CCP) membership. Sex (1 for male, 0 for female) and marital status (1 for ever married, 0 for never married) are binary variables. Education is measured by years of schooling. Work experience was measured in years by the difference between the current age and the age at the first year of experience. Occupation is measured by International Socioeconomic Index (ISEI) (Ganzeboom et al. 1992). These are all continuous variables. Hukou and CCP membership are two important stratification indicators in China’s context (Wu and Treiman 2004). Both of them are measured as binary variables, with 1 for urban hukou and party members. Finally, a binary variable indicating whether the respondent was a government employee (yes = 1) is used.

All of these variables are used to predict the individual’s (monthly) earnings resulting from his/her work. Note that the inflation adjustment is made based on the yearly consumer price index (CPI) published by the National Bureau of Statistics (NBS) so that the dollar is constant across two years. Both earnings and organization size are undertaken a logarithm transformation, following the routine procedure employed by previous studies. Since both the 1996 and 2006 survey data are nationally representative, regional variation should be seriously considered. This can be achieved by controlling province dummies when addressing the size-earnings relation.

The estimation method is ordinary least square (OLS) regression. As there are two sets of independent variables, one at the individual-level and the other at the organizational level, they can be put into the regression model separately and then collectively when year-specific dataset is analyzed. To detect the temporal change from 1996 to 2006, the two datasets are also pooled together to be analyzed. All the models were estimated using STATA. Furthermore, the survey estimation procedure was used, since both datasets are not simple random samples but adopt a multistage probability sampling procedure. In the 1996 data, the survey estimation procedure adjusted sample

clustering as well as stratifying and weighted the data by household size. But in the 2006 data, it only adjusted sample clustering and weighted the data by household size because sample stratifying information was not well documented.

As this research involved comparison among different models, the sample size had to be identical across them. After restricting the research population as wage earners, the sample size of the 1996 and 2006 data are 1654 and 2257, respectively. However, the missing data problem, for all of the variables introduced above, inevitably exists for both two datasets. In the 1996 data, the case-wise deletion procedure loses nearly 10 % of the legitimate respondents, yielding a net sample of 1501 cases. In the 2006 data, the case-wise deletion procedure loses nearly 30 % of the legitimate respondents, yielding a net sample of 1639 cases. In the descriptive statistics and formal regressions, the 1501 cases for 1996 and 1639 cases for 2006 are used, but the multiple imputation procedure is also applied to both datasets to remedy the missing data problem and check the robustness of analysis results.

## Results

The descriptive statistics of all of the variables used by this research are examined in Table 1. By comparing the descriptive characteristics of samples in 1996 and 2006, one can probe the basic changes of China's urban labor market. Three observations are notable.

First, employment structure underwent a dramatic change, especially for the relative proportion of labors working in SOEs vs. private enterprises. In 1996, about 45.69 % of the employees worked in SOEs, and only 5.81 % worked in private enterprises. But after

**Table 1** Descriptive statistics of variables, urban China 1996 and 2006

	1996 (N = 1501)	2006 (N = 1639)
Continuous variables		
Monthly earnings (yuan)	468.96 (327.99)	1368.01 (2718.25)
Organizational size	1044.74 (2625.10)	649.10 (1788.40)
Organizational rank	2.26 (0.98)	2.78 (1.78)
Years of schooling	10.28 (3.08)	11.27 (3.32)
Age	37.60 (10.55)	36.06 (10.04)
Experience	18.78 (10.86)	15.22 (10.29)
Occupation (ISEI)	47.44 (15.33)	45.91 (14.28)
Discrete variables		
Ownership type		
State agencies	31.95	33.76
State-owned enterprises (SOEs)	45.69	26.33
Collective enterprises	16.54	6.85
Private enterprises	5.81	33.06
Government employees	7.27	7.19
Male	58.51	57.84
Ever married	86.73	81.39
Urban hukou	94.08	83.74
Party membership	22.50	15.68

Data are weighted. For continuous variables, mean and standard deviations (in parentheses) are reported; for discrete variables, percentages are reported



ten years, that percentage of workers in private enterprises surpassed of that in SOEs (33.06 vs. 26.33 %). Second, the average employment size of work organizations dropped sharply. The average number of employees across various kinds of organizations in urban China was slightly over 1000 in 1996 but was only over 600 in 2006, decreasing by 40 %. Since SOEs under the planned economy were typically characterized by a large number of redundant employees, one important aspect of reform during the 1990s was to lay off part of its labor force (usually unskilled workers aged in their 40s and 50s). As a result, it is not so surprising that the average employment size dropped to a large extent.

Third, the labor force composition in urban China also changed a lot. What catches our eyes immediately is the almost doubled percentage of rural hukou workers from 1996 to 2006 (5.92 vs. 16.26 %). Another change is the slightly increased years of schooling (10.28 in 1996 vs. 11.27 in 2006). Finally, along with China's economic growth, workers' monthly earnings in average increased by nearly two times from 1996 to 2006.

The zero-order correlation between logged organization size and logged worker earnings is first examined (see Appendix Table 8). Previous studies usually found such a bivariate correlation to be statistically significant. However, this was not the case in 1996 for urban China. Interestingly, after controlling province dummies, a positive size-earnings correlation is established. In contrast, organization size and worker earnings were significantly correlated in 2006, no matter whether controlling for province dummies or not. The reason a significant size-earnings correlation in 1996 existed only after controlling province dummies may be that many large-size enterprises, particularly SOEs, were located in provinces/regions where local economic performance was quite bad. A good example is that many large heavy-industry SOEs are located in northeast China, i.e., Liaoning, Jilin, and Heilongjiang province. In the mid-1990s, these SOEs employed a large number of redundant workers and suffered serious financial difficulties. As a result, the profit-making capacities of these large SOEs lagged behind small enterprises that were located in coastal provinces where the average economic performance was much better. Since employees' earnings are intrinsically determined by their work units' profit performance, size-earnings relation is inevitably disturbed by such provincial variation. However, radical reform of SOEs initiated at the national level since 1997 has fundamentally changed this situation. A large number of redundant workers were laid off to alleviate burdens for SOEs, many small or medium deficit-ridden SOEs were privatized, and large SOEs were granted plenty of capital, resources, and policy privileges by the central government. Thus, it is not surprising that the zero-order correlation between size and earnings can be established now, even without accounting for provincial variation. From a different perspective, the change observed between 1996 and 2006 also demonstrates that China's urban economy is becoming more unified across provinces/regions.

Turning to the essential regression models, as size-earnings relation in 1996 can only be established by ruling out provincial disturbance, all of the models that are estimated for both 1996 and 2006 data control province dummies. Results for the 1996 data are displayed in Table 2. Model 1 is the baseline model, showing the overall size effect on earnings (controlling for province dummies). As both size and earnings are undertaken logarithm transformations, the coefficient 0.039 means that a 1 % increase in

**Table 2** OLS regressions of (ln) earnings on (ln) organizational size and selected control variables, urban China 1996 ( $N = 1501$ )

	Model 1	Model 2	Model 3	Model 4
(ln) Size	0.039** (0.013)	0.033* (0.013)	0.040** (0.012)	0.038** (0.012)
Organization-level variables				
Ownership type				
State agencies (ref.)				
State-owned enterprises		-0.134** (0.036)		-0.029 (0.035)
Collective enterprises		-0.211* (0.088)		-0.098 (0.083)
Private enterprises		0.285* (0.115)		0.426** (0.145)
Rank		0.101*** (0.020)		0.056** (0.018)
Individual-level variables				
Years of schooling			0.031*** (0.007)	0.028*** (0.007)
Experience			0.013* (0.005)	0.016*** (0.004)
Experience <sup>2</sup>			-0.0001 (0.0001)	-0.0002 (0.0001)
Male			0.214*** (0.038)	0.206*** (0.038)
Occupation (ISEI)			0.004** (0.001)	0.004* (0.002)
<i>F</i>	10.86***	12.31***	16.20***	16.23***
<i>R</i> <sup>2</sup>	0.14	0.18	0.24	0.26

Data are weighted. Unstandardized coefficients and robust standard errors (in parentheses) are reported. Province dummies and constant term are controlled

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two tails test)

organization size is related to a 0.039 % increase in earnings. Although this effect seems to be small, it is not. Given that organization size ranges widely from less than 100 employees to over several thousand, the finding suggests that workers in smaller organizations earn considerably less than workers in larger organizations. For example, a 500 % increase in organization size, from 100 to 600, would be associated with 7 % higher wages ( $6^{0.039} = 1.07$ ).

Model 2 controls organizational covariates to quantify the net size effect. Strikingly, the coefficient decreases by 15 %. This means that a significant part of the size-earnings relation can be explained by other organization characteristics that have been identified by previous danwei literature, i.e., ownership, type, and rank. However, controlling for individual-level variables did not change the size coefficient at all in spite of their significant effects on earnings (see model 3). The contrast between model 2 and model 3 implies that in 1996, organizational characteristics were more important than individual characteristics in explaining the size-earnings relation in urban China. In

model 4, in which organizational and individual variables were collectively controlled, the net effect of size on earnings is estimated at 0.038.

Results of essential regression models for the 2006 data are shown in Table 3. The overall size effect on earnings (controlling for province dummies) is estimated at 0.089 in the baseline model (see model 1), meaning that a 1 % increase in organization size is related to a 0.089 % increase in earnings. In model 2, organization-level variables are controlled, but this had no substantial influence on size effect. Model 3, controlling individual-level rather than organizational-level variables, reveals that the size effect decreased by 19 %. The contrast between model 2 and model 3 implies that in 2006, individual characteristics are more important than organizational characteristics in explaining the size-earnings relation in urban China, a reverse of the pattern from 1996. Finally, collectively controlling for organizational and individual-level variables yielded a net size effect of 0.077 (see model 4).

Why is it that individual characteristics had no impact on size-earnings relation in 1996 but reduced the correlation in 2006? Recall that one explanation for observed

**Table 3** OLS regressions of (ln) earnings on (ln) organizational size and selected control variables, urban China 2006 ( $N = 1639$ )

	Model 1	Model 2	Model 3	Model 4
(ln) Size	0.089*** (0.013)	0.090*** (0.013)	0.072*** (0.012)	0.077*** (0.012)
Organization-level variables				
Ownership type				
State agencies (ref.)				
State-owned enterprises		-0.134* (0.060)		0.025 (0.058)
Collective enterprises		-0.154* (0.072)		0.029 (0.069)
Private enterprises		-0.022 (0.057)		0.210*** (0.059)
Rank		0.030* (0.013)		0.017 (0.011)
Individual-level variables				
Years of schooling			0.048*** (0.007)	0.052*** (0.006)
Experience			0.006 (0.007)	0.010 (0.007)
Experience <sup>2</sup>			-0.0001 (0.0002)	-0.0002 (0.0002)
Male			0.210*** (0.031)	0.209*** (0.031)
Occupation (ISEI)			0.007*** (0.001)	0.008*** (0.001)
$F$	19.76***	18.10***	32.20***	29.68***
$R^2$	0.27	0.28	0.40	0.41

Data are weighted. Unstandardized coefficients and robust standard errors (in parentheses) are reported. Province dummies and constant term are controlled

\* $p < 0.05$ ; \*\*\* $p < 0.001$  (two tails test)

size-earnings relation is that sorting and selection mechanisms channel higher quality workers with higher levels of both measured and unmeasured human capital to larger organizations. If this makes sense, then the answer should lie in the gradual increase of labor mobility across work organizations in China's urban labor market. It is known that under China's *danwei* system in the pre-reform period, lifetime employment was very pervasive, and there was actually no labor market at all. Since each work unit had "ownership rights" over its workers for the production of goods or services, and each government jurisdiction also had "ownership rights" over workers in the enterprises and the institutions it supervised, resignations, dismissals, and job transfers became virtually nonexistent for ordinary workers (Naughton 1997). Workers themselves virtually had no say in choosing the work units they could enter or change.

During the early 1980s to the mid-1990s, the urban reform apparently did not successfully boost labor mobility, despite many policies being issued by the central government aiming to dismantle the lifetime employment system. Thus, a true labor market was still lacking. As noted by Xie and Hannum (1996) in their analysis on the data from the 1988 Chinese Household Income Project (CHIP), "the relationship between employers and employees remains essentially in the old socialist order, although economic reforms have generated new manifestations of this relationship" (p. 979). Moreover, life-history data collected in 1994 in urban China indicated that, despite growing opportunities outside the state sector since the early 1980s, only limited changes occurred in job-shift patterns (Zhou et al. 1997). As labor mobility was still quite limited during this period, labor-sorting processes that are thought to channel higher quality workers into larger work organizations had little applicability to urban China in 1996. Therefore, it is not surprising that the size-earnings correlation cannot be reduced by simply controlling for individual characteristics of employees.

Only in the late 1990s did the Chinese government begin to change social conditions by weakening workers' organizational dependence on their work units so as to facilitate labor mobility, and these changes mainly included the housing provision undergoing rapid commercialization and the social security system becoming detached from the *danwei*. Moreover, as mentioned earlier, SOEs have experienced rapid and large-scale privatization since the mid-1990s, and millions of workers have been retrenched from the state sector to make a living in the market. It is very difficult for retrenched workers to find suitable and decent jobs, and this process inevitably involves frequent changes of employers (Li and Zhang 2003). At the same time, rural migrants increasingly entered cities/towns to find non-agricultural jobs during the 1990s–2000s, and frequently changing jobs is a main characteristic in this very competitive labor market (Zhang 2011). All of these forces have increased labor mobility rate since the late 1990s (Li 2013). The labor-sorting process can now operate, as the condition of labor mobility was satisfied in 2006. As a result, it is not surprising that size-earnings relation can be partly explained by controlling for the individual characteristics of employees.

The question then arises as to why organizational characteristics partly explained the size-earnings relation in 1996 but lost their influence by 2006? Note that the variables at the organization level only indicate three characteristics that are thought to be significant mechanisms for *danwei*-based stratification in redistributive systems: ownership, type, and rank. A few studies, conducted in the early 1990s concluded that redistributive institutions continue to be significant or even dominant mechanisms of

social stratification (e.g., Bian and Logan 1996). If this is valid, then the three indicators that reflect organizational positions in redistributive systems should be more meaningful than the simple measure of size. Thus, it is observed that the size-earnings relation can be explained partly by the other three dimensions of work units in the 1996 data. Accordingly, the possible explanation for the disappearance of this observation in the 2006 data is that the role of redistributive mechanism diminishes, given China’s rapid transition to market economy in the 10-year period.

The statistical patterns of size-type and size-rank associations at the organization level further consolidate the above explanation that the redistributive mechanism diminishes. In Table 4, the sample is grouped according to the quartiles of organization size, and for each subsample, the distributions of organization type (as reported by percentages) and rank (as reported by means) are displayed. This shows that compared to smaller organizations, larger organizations are more likely to be SOEs but less likely to be private enterprises, and their administrative ranks also tend to be higher. Since such association patterns clearly exist in both the 1996 and 2006 data, one cannot attribute the disappearance of explanation power of organizational type and rank in 2006 to the hypothetical different associations between size and the other two organizational characteristics. In Table 5, a series of log-linear models estimated for the associations among type (denoted as T), size (denoted as S), and year (denoted as Y) are presented. The first model implies that there is no any association among the three variables. The second model implies there are associations between type and year and between size and year, but there is no association between type and size. The third model implies that type is associated with size, but neither of them is associated with year. The fourth model implies the association between type and size does not change by year. Model 4 is indeed the non-saturated model that fits the data well. Therefore, the supplementary analysis in Tables 4 and 5 lends more confidence toward explaining the observed contrast between Tables 2 and 3 as the redistributive mechanism losing its power.

Redistributive institutions not only lose power in explaining size-earnings relation in 2006, but also fail to be important determinants of worker earnings, as reflected by the coefficient of rank in the models. In 1996, a one-level increase of an organization’s rank was associated with a 6 % increase of employee’s earnings ( $e^{0.056} = 1.06$ , see model 4 in Table 2), but in 2006, the coefficient became insignificant (see model 4 in Table 3).

**Table 4** Size-type and size-rank associations at organization-level in 1996 and 2006 data, urban China

	1996 (N = 1501)				2006 (N = 1639)			
	Size				Size			
	Small	2	3	Large	Small	2	3	Large
Type (percent)								
State agencies	47.47	40.80	25.00	11.20	27.14	38.05	33.17	21.46
SOEs	20.53	31.47	53.46	77.60	8.07	18.29	30.73	55.61
Collective	16.53	19.73	18.62	10.40	4.65	6.83	10.24	8.78
Private	15.47	8.00	2.93	0.80	60.15	36.83	25.85	14.15
Total	100	100	100	100	100	100	100	100
Rank (mean)	1.63	2.04	2.41	2.79	1.83	2.75	3.03	3.73
N	375	375	376	375	409	410	410	410

**Table 5** Log-linear models for associations among type (T), size (S), and year (Y) in 1996 and 2006 data, urban China

Model	df	L <sup>2</sup>	BIC	ID	P
M1: (T) (S) (Y)	24	1132.582	939.335	0.241	0.000
M2: (TY) (SY)	18	704.238	559.302	0.193	0.000
M3: (TS) (Y)	15	502.880	382.101	0.160	0.000
M4: (TS) (TY) (SY)	9	10.730	-61.738	0.021	0.295
Contrast	df	L <sup>2</sup>	P		
M3 vs. M4	6	492.15	0.000		

Actually, organizational rank had already been found to be losing its predictive power for income by other studies (Zang 2002). Tables 2 and 3 also show that employees in private enterprises earn more than their counterparts working in other economic sectors (see model 4). Again, this find already emerged from other studies (Xie and Wu 2008; Zang 2002; Zhou 2000).

To check the robustness of the estimated effect of size on earnings in model 4 in both Tables 2 and 3, four more control variables at the individual-level, including marital status, hukou, party membership, and government employees, are added into the model. The results are listed as model 5a for the 1996 data and model 5b for the 2006 data in Table 6. Remarkably, for both datasets the reestimated coefficients are quite similar to previous ones obtained. As mentioned before, there is the missing data problem in both datasets, so the multiple imputation procedure is used as a remedy. The results are listed as model 6a (for the 1996 data) and model 6b (for the 2006 data) in Table 6. As one can see, the pattern of results remains the same between the case-wise deletion procedure and the multiple imputation procedure.

How about the change of the size-earnings correlation from 1996 to 2006? Although it is obvious that the size effect nearly doubled from 1996 to 2006, such a change should be formally tested. This is conducted by pooling the two datasets together and then estimating the interaction effect between organization size and year dummy. Based on previous analysis, three models are estimated, and all of the results are presented in Table 7. The first model only incorporates three key variables (controlling for province dummies): logged size, year dummy, and the interaction between them. The

**Table 6** Robustness check for size effect on earnings, urban China 1996 and 2006

	1996		2006	
	Model 5a (N = 1501)	Model 6a (N = 1654)	Model 5b (N = 1639)	Model 6b (N = 2257)
(ln) Size	0.036** (0.011)	0.032** (0.011)	0.078*** (0.012)	0.082*** (0.010)
Organization-level variables	Yes	Yes	Yes	Yes
Individual-level variables	Yes	Yes	Yes	Yes
Additional control variables	Yes	Yes	Yes	Yes
F	14.92***	-	26.91***	-
R <sup>2</sup>	0.27	-	0.42	-

Data are weighted. Unstandardized coefficients and robust standard errors (in parentheses) are reported. Province dummies and constant term are controlled

\*\*p < 0.01; \*\*\*p < 0.001 (two tails test)



**Table 7** OLS regressions of (ln) earnings on (ln) organizational size and control variables for pooled data, urban China 1996–2006 ( $N = 3140$ )

	Model 1	Model 2	Model 3
(ln) Size	0.033*** (0.008)	0.035*** (0.008)	0.035*** (0.008)
Year dummy (2006 = 1)	0.785*** (0.060)	0.712*** (0.059)	0.710*** (0.059)
(ln) Size* year dummy	0.043*** (0.011)	0.038*** (0.010)	0.039*** (0.010)
Organization-level variables	No	Yes	Yes
Individual-level variables	No	Yes	Yes
Additional control variables	No	No	Yes
$F$	110.21***	111.58***	102.15***
$R^2$	0.52	0.58	0.59

Unstandardized coefficients and robust standard errors (in parentheses) are reported. Province dummies and constant term are controlled

\*\*\* $p < 0.001$  (two tails test)

second model additionally controls the basic organizational as well as individual characteristics, including ownership type and rank, years of schooling, experience, experience squared, sex, and occupational ISEI. The third model adds the other four variables at the individual-level, i.e., marital status, hukou, party membership, and government employees. In all three models, the main effect of size and the interaction effect between size and year dummy are both positively significant, which suggests that the size-earnings correlation indeed became larger from 1996 to 2006.

### Discussion and conclusion

That employees in larger work organizations earn more than those in smaller ones is a typical as well as robust finding in a market economy. This research extended the topic into the context of China, the second-largest economy in the world and one that has been undergoing a rapid market-oriented transition since its reform. Using two nationally representative survey datasets, one conducted in 1996 and the other in 2006, this research explored three questions centered on the size-earnings relation.

The first question was whether organization size mattered for earnings variation in urban China. A zero-order correlation between size and earnings was indeed observed in 2006 but not in 1996; however, after provincial or regional disparity was ruled out, it was also established for 1996. The second question was concerned with how this size-earnings relation could be explained by individual as well as organizational characteristics. This correlation remains significant after the two sets of independent variables were controlled. Despite this similarity between 1996 and 2006, a notable change was also detected. This change lay in the relative power of organizational vs. individual characteristics as the explanatory factors for size-earnings relation. Individual characteristics had no impact on the size-earnings relation in 1996 but did reduce the size-earnings correlation in 2006; on the contrary, organizational characteristics partly explained the size-earnings relation in 1996 but lost this influence in 2006. The third question was about the temporal change of the size-earnings relation from 1996 to 2006. The net effect of organization size on worker earnings was found nearly doubled

during the 10-year period. This increment was indeed statistically significant in the formal test by pooling the two data together.

What are the implications of these empirical findings? Basically, there are three. First, it seems that, along with the market-oriented transition, organization-based stratification in urban China is converging to a typical scenario in a market economy. This is reflected by the fact that the size-earnings correlation remains significant even after controlling for a set of individual as well as organizational characteristics. Furthermore, the zero-order correlation is more robust in 2006 than in 1996, and the net size effect even increases dramatically during the 10-year period.

Second, the changing pattern of explaining the size-earnings relation between 1996 and 2006 reveals the increase of labor mobility across work organizations, thus suggesting the development of China's urban labor market. As observed by some researchers (e.g., Xie and Hannum 1996), the employment relationship remains essentially unchanged in the early stages of economic reform. In the late 1990s, however, the Chinese government began to change institutional conditions by weakening workers' dependence on their work units. Since then, labor mobility across work organizations has been boosted (Li 2013), leading labor-sorting processes to make the role in channeling higher quality workers into larger organizations. This has resulted in the reduction of the size-earnings correlation due to controlling for individual characteristics, a pattern that was not observed in 1996.

Third, there is the sign that the redistributive mechanism has diminished during China's transition toward a market economy. This is not only reflected by the disappearance of its explanative power for the size-earnings relation in 2006 but is also suggested by the finding that organizational rank fails to be a significant determinant of workers' earnings. However, one should be cautious about the generalization on the relative dominance of redistributive vs. market mechanism in the process of China's reform. Although this is the key issue in the great debate around the theory of market transition (see Chen 2006), some more elaborate research has already cautioned that it is not appropriate to simply use certain observed variables to indicate underlying mechanisms (Wu and Xie 2003). Clearly the observed effect of organization size on earnings should not be naively attributed to market mechanism because it could also be the result of redistributive mechanism operated in indirect ways, or the outcome could be generated by both the market and the redistributive mechanism.

This study showed that in urban China's transition context, organization size is indeed another significant contributor to earnings inequality, in both statistical and substantive senses. Thus, further attention and examination should be paid to this size-earnings relation. There have been various propositions to account for the size-earnings relation in the literature, mainly including the market environment (e.g., industrial sector), labor force quality or labor-sorting process, labor-management relations (e.g., unionization), and structure of employment relations (e.g., internal labor market). Due to data limitations, this research is capable of testing only a few of them, such as the labor-sorting process. Therefore, more work needs to be done to explain the observed size-earnings relation in urban China.

This research also finds that the strength of correlation between organization size and wage significantly increased from 1996 to 2006. In order to test the robustness of this increasing trend, I further analyzed the data from the Chinese General Social Survey (CGSS)

in 2003 and 2005.<sup>8</sup> By using the similar working samples, analytical variables and regression models, zero-order correlation of organization size and earnings, correlation controlling for province dummies, regression coefficient controlling for main intervening variables, and regression coefficient controlling for all variables are estimated. Comparing the estimates in 1996, 2003, 2005, and 2006 in the Appendix Table 8, one can see that the size effect increases across the time. Using the estimates of full model as an example, the elasticity coefficient in 1996 is 0.036, 0.044 in 2003, 0.049 in 2005, and 0.078 in 2006. For a more rigorous and systematic research on the dynamic trend of the relationship between organization size and wage, one needs to analyze more data of following years. But more importantly, how can we explain this increase? Is it a result of the development of the urban labor market or a by-product of the decrease in the average size of organizations? Regarding the period analyzed in this research from 1996 to 2006, the average organization size decreased in general, due to the reform of SOEs (see the Appendix Table 8).<sup>9</sup> Meanwhile, the institution reform also happened in this period, making it hard to distinguish their effects. This deserves further study in following research.

Finally, this research used only household survey data in which organizational characteristics were reported by individual respondents. To address the relationship between work organization and social stratification, this type of data is inferior relative to employers-employees matched data. Thus, future study on this topic in China should try to collect data in more creative ways, similar to what has been done in other countries during the past several decades.

## Endnotes

<sup>1</sup>However, in order to test the robustness of the trend of size-earnings relation, this research also analyzes the data of the years of 2003 and 2005. Please refer to the last section of this paper for details.

<sup>2</sup>This brief summary is mainly based on six pieces of literature: Brown and Medoff (1989), Kalleberg and Buren (1992), Reilly (1995), Kalleberg and Buren (1996), Troske (1999), and Hollister (2004).

<sup>3</sup>An exception is the research conducted by Walder (1992), in which workplace size was indeed found to be a significant predictor for workers' job benefits in the city of Tianjin.

<sup>4</sup>It is mainly because that the 1996 survey did not collect enough information on respondent's work and organization, such as industry.

<sup>5</sup>For the 1996 survey, see <http://www.sscnet.ucla.edu/issr/da/lhscs/chinaweb.html>. For the 2006 survey, see <http://cgss.ruc.edu.cn/>.

<sup>6</sup>At the end of 2005, employees in the state-owned *danwei* accounted for nearly one quarter of all workers in urban areas. See <http://www.stats.gov.cn/tjsj/ndsjs/2006/indexch.htm>.

<sup>7</sup>Actually, in comparing the basic patterns of size-earnings relation obtained from this procedure to those from the procedure excluding government employees, there is no notable divergence for either of the two datasets. What is more, the main results are quite similar if government employees are excluded.

<sup>8</sup>For CGSS project, please refer to the introduction by Bian and Li 2012.

<sup>9</sup>Although the average organization size in 2005 is slightly higher than that in 2003, it generally decreases.

## Appendix

**Table 8** Various estimates on (ln)size-(ln)earnings relation, urban China in 1996–2006

	1996	2003	2005	2006
Zero-order correlation	0.018 (ns)	0.047***	0.063***	0.073***
Correlation controlling for province dummies	0.039**	0.043***	0.056***	0.089***
Regression coefficient controlling for main variables	0.038**	0.043***	0.048***	0.077***
Regression coefficient controlling for all variables	0.036**	0.044***	0.049***	0.078***
Average organization size	1044.74	753.18	816.84	649.10

ns non-significant

\*\* $p < 0.01$ ; \*\*\* $p < 0.001$  (two tails test)

### Competing interests

The author declares that he has no competing interests.

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