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UNDERSTANDING THE SIGNIFICANT ROLE OF LABOR SUBCONTRACTORS FOR THE FUTURE CHINESE CONSTRUCTION INDUSTRY

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ABSTRACT

In China, more than 80% of construction site laborers are migrants from rural areas, employed through intermediaries (*baogongtou*) under an informal employment status. This practice has been blamed to be the cause of increasing labor issues and project failures. However, despite the strict prohibition in recent years, they still exist abundantly on sites. This paper explores the root cause behind that phenomenon through better understanding involved parties in labor subcontracting business. Surveys were conducted in China Construction Railway Corporation-12 Bureau on the benefits and risks of two existing paradigms of labor management, from perspectives of general contractor (GC), labor subcontractor (LS) and laborers, respectively. Further analyses were done through modeling resource allocation between GC and subcontractor (SC) to verify the limitations and drawbacks of the existing systems on LS's development. Current subcontracting systems are argued to be short of economic incentives to LSs for good performance. As the instability of jobs from construction contractors largely threatens the business running of LSs, the limitation on LSs' work scope to labor-service-only actually becomes a bottleneck for them to survive in construction market, no matter to say further development. Moreover, the unreliable working culture, widely existing in the Chinese construction industry, has aggravated the vulnerability of subcontractors in today's increasingly competitive and uncertain business environment. It in turn hinders GC's development as well, regarding the 'two layer separation' reform since 1980s. It is suggested that GC should recognize the increasing significance of LS's indispensable role in both fulfilling project objectives and improving labor force problems. Two available approaches are put forward as enlarging LSs' business scope and promoting long-term work relation between GC and LS.

Keywords: Migrants, Labor Subcontractor, Incentive, Uncertainty, Long-term

1. INTRODUCTION

In China, the rapid pace of development in the construction industry concurrently brings new and urgent challenges that must be acknowledged and accepted. One of those challenges is believed to be its labor force along with an increasing practice of labor subcontracting. More than 80% of

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construction site laborers are migrants from rural areas. They are usually employed through intermediaries (locally called *baogongtou*) under an informal employment status, which are mostly based on social bonds instead of legal contracts. This practice has been blamed to be a major cause of the increasing labor issues, such as the default of payment, long working hours, poor occupational health and safety conditions, insecurity of employment, and low rate of social insurances, and so on (Yin and Furusaka 2008; Limenih 2010). Regarding the negative social impacts, those labor issues have already drawn grave attentions by public over a long period. Meanwhile, this practice is blamed to the cause of project failures as well (Tam et al. 2004). All above directly lead to a negative image of construction industry. Similar to many other countries, the construction industry in China is known as a work place with 3Ds (Dangerous, Dirty, Difficult or Demeaning; 3Ks in Japanese as Kiken, Kitanai, Kitsui). It results in more and more difficulties in both recruiting and holding back its labor force, especially among the growing new generation of migrants in recent China (RGAP 2011). It is not exaggerating to say that the Chinese construction industry employers lag behind other industries in how they conduct their people practices. This gap must be closed; otherwise recruitment and retention of construction employees will become chronic problems in the near future. It calls for the Chinese construction to place considerate importance on developing labor-oriented strategies for sustainable development. This paper is trying to explore a deeper understanding of involved parties in labor provision business. Surveys on labor management were conducted in China Construction Railway Corporation-12 Bureau (CRCC-12) regarding the benefits and risks of labor subcontracting from perspectives of general contractor (GC), labor subcontractor (LS) and laborers, respectively. Further analyses were done through modeling the activity of resource allocating in order to identify the limitations and drawbacks of the existing subcontracting systems on LSs' ongoing development.

2. EVOLVEMENT OF CONSTRUCTION LABOR MANAGEMENT SYSTEM IN CHINA

This section briefly surveys the evolvement of construction labor management in China.

2.1. Permanent Employment under Commanding Systems

Before Reform and Opening-up Policy was embarked in China, most construction projects were undertaken under commanding systems. The construction projects were directly commanded and supervised by central or local governments. Then the projects were conducted and operated by construction state-owned enterprises (SOEs), which actually were restricted by supervisory government agencies. As a result, the enterprises had little autonomy with regard to obtaining workload and labor force as well. In other words, they had to wait for the government agencies to assign construction works to them. Meanwhile, their personnel, including technical, managerial and skilled field laborers were allocated by the government and employed permanently. Besides, materials, equipment, capital and other inputs were also allocated by the government as part of the central planning process. The entire industry could thus be viewed as a single large enterprise with a

centralized hierarchical organization where factors of production and other resources were allocated almost exclusively through administrative channels (Lu, 2001).

2.2. Contractual Employment under Bidding and Tendering Systems

Along with deepening of the Reform and Opening-up Policy in China, there are two prominent changes happening in construction labor market (BCIHRA 2012). One is decreasing the proportion of permanent workers and promoting contractual employment in SOEs to achieve employment flexibility. The other is the separation of management layer and field operation layer in SOEs, along with the introduction of Bidding and Tendering Systems into the Chinese construction industry. As a result, on one hand, most operational field workers who had previously been employed directly and permanently by SOEs have been laid off and reemployed by subcontractors under contractual employment status. On the other hand, a huge number of surplus rural laborers have migrated to urban areas and then largely been absorbed on construction sites with a low threshold, temporarily employed by intermediaries or labor contractors. Along with the two-layer separation in construction management, the practice of labor outsourcing increased, with a boom of informal labor contractors (locally called *baogongtou*) who began to play a central role in labor provision business. Here, *baogongtou* is head of the working team with migrant laborers usually coming from the same rural area. *Baogongtou* exerts profound influences on the labor contracting business and the lives of construction workers. Through joining an informal team headed by *baogongtou*, the laborer is provided with an opportunity to obtain work and acquire skills, which can lead to higher income to some extent. However, this opportunity is mostly denied to those without family and social connections with *baogongtou* that are needed to join the team. Thus, it is regarded as a barrier to training and innovation (AN 2011). Even worse, frequent construction accidents and labor payment default have been reported with an indiscriminate blame on *baogongtou* universally. As a result, *baogongtou* is considered to have negative connotations, which precipitated the Chinese government to prohibit informal *baogongtou* and promote formal labor service enterprises (LSEs) as an alternative in labor provision business (MOHURD, 2005).

2.3. Two Paradigms of Construction Labor Management

Two paradigms of construction labor management are given based on the surveys at CRCC-12.

2.3.1. Paradigm of Labor Management Involving *Baogongtou*

The labor management paradigm in which *baogongtou* plays a central role in providing laborers is shown in Figure 1. There are two major risks as follows. The first one is the infringement on legal rights of migrant laborers. Generally speaking, as the team headed by *baogongtou* is usually a temporal organization which can be easily influenced by variable factors such as season, location, project progress and duration, the laborers do not have any guarantee of employment. Moreover, since the management by *baogongtou* relies on social relations rather than legal contract, laborers' rights can be easily infringed by arbitrary team leaders. For example, it is *baogongtou* that has been

found as the 'culprit' in the frequent cases of unreasonable arrears or squeeze of labor payment in recent years. The other risk lies in project safety and quality management systems with construction contractor's role fading on site. Considering that most migrant laborers and even *baogongtou* do not have sufficient construction experiences, capabilities or competencies, and sense of responsibilities yet, project safety and quality are commonly under high level of risk. It has been frequently blamed to be a major cause of construction accidents and quality problems (Li and Xiang 2011).

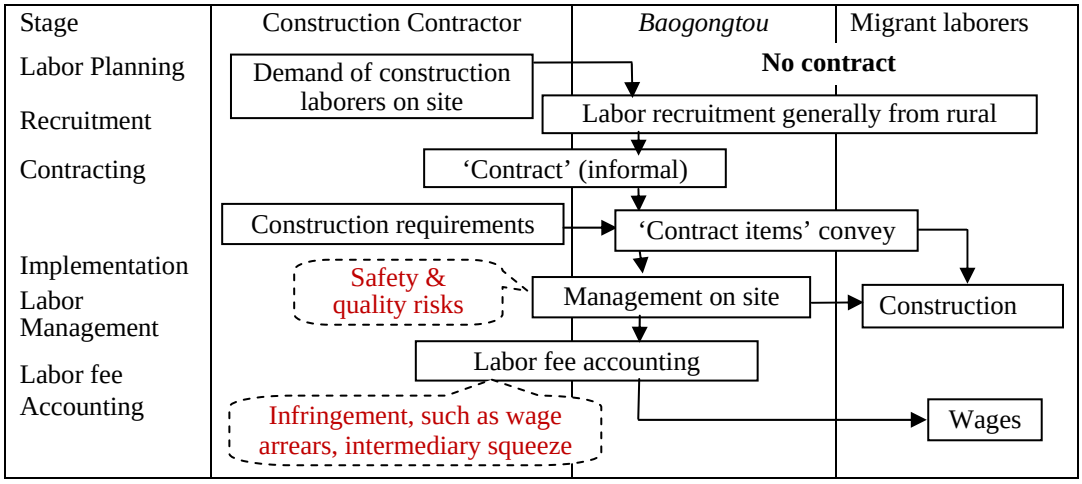

Figure 1: Labor management paradigm involving *Baogongtou*

2.3.2. Paradigm of Labor Management Involving Labor Service Enterprise (LSE)

To ensure the implementation of quality and safety management, and prevent migrant laborers from being defaulted by *baogongtou*, and establish an effective mechanism to stimulate migrant laborers, labor service enterprises (LSEs) have been promoted vigorously in China since 2005. It is then required rigidly all construction enterprises should only invite bids of labor service from LSEs that have business licenses of labor subcontracting from 2008. Most construction LSEs came into being under this background. The paradigm of labor management involving LSE is shown in Figure 2.

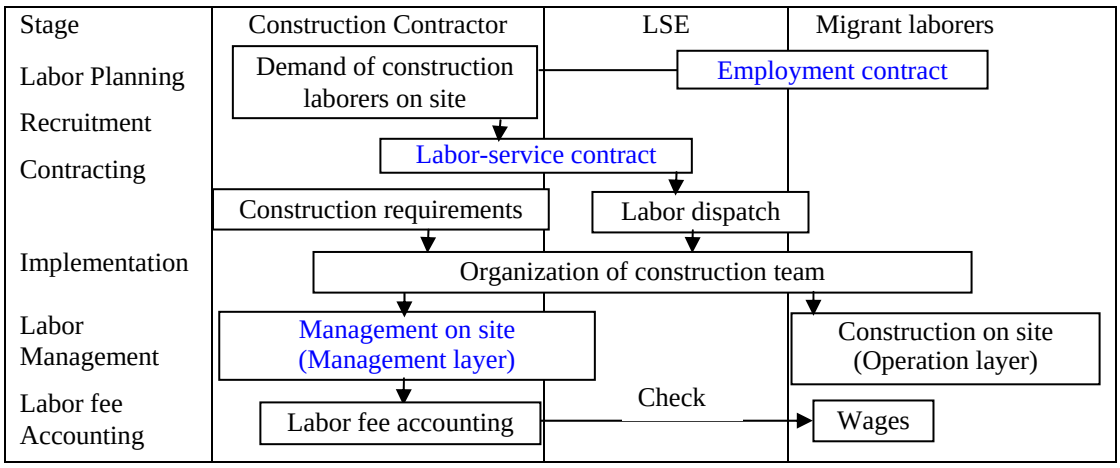

Figure 2: Labor management paradigm involving LSE

The major changes are listed as follows. First, since LSEs are legal persons, they should sign an employment contract with laborers and take charge of personnel recruitment and training, routine management, remuneration payment, social insurances and so on. Second, the construction contractor should sign the labor-service contract with LSE to regularize the labor management on site. Third, the construction contractor should be more involved in site management. Here, LSE is only permitted to provide labor service under current construction subcontracting systems.

Despite the merits of this paradigm regarding protecting laborers and ensuring safety and quality, LSEs have not matched expectations in terms of development, and the stagnation of the growth of construction LSEs has been gradually revealed (An 2011). It indicates that current development of LSEs is far from enough to meet the practical demand of construction production. From another perspective, most field workers on construction site have still been under supervision of *baogongtou*. At CRCC-12, most interviewed project managers admit that 'illegal' *baogongtou* remains to abound on construction sites in disguise since it is preferable to LSE in labor subcontracting business. The direct cause lies in the principle of Cost Based Selection (CBS) under current competitive tendering systems, which makes the informal *baogongtou* with lower labor cost by evading the overhead costs and on-costs of formal employment beat the competition. The root cause may exist in subcontracting systems with excessive restrictions on labor contractors' further development (An 2010). It ignores the potential of labor subcontractors to become a specialty one or even higher level amid the construction supply chain to a great extent. Regarding the limitation on business scope to labor-only for labor contractors, as most of them are small and medium-sized, it is harder for them to cope with various uncertainties inherent in their businesses. No matter to say developing their capabilities further. In a word, under current excessively restricted and competitive subcontracting market, there is little economic incentive to promote corporatization among labor contractors. Up till now, general contractors complain that subcontracting market is too disordered and deficient in supplying qualified subcontractors with labor and specialist skills; meanwhile, *baogongtou* as well as LSE complain they could not see any promising future in today's insecure business environment. Thus, fundamental improvement of laborers' situation has not yet been achieved. Policies and regulations may need to be reassessed and adjusted. Instead of compulsive enforcement by administration, efforts should be made to understand their economic behaviors.

3. UNDERSTANDING SUBCONTRACTING BUSINESS

A tentative analysis on the potential economic incentives for subcontractors is conducted through understanding their economic behaviors in construction subcontracting business.

3.1. Uncertainties Threating Construction Subcontracting Business

It must be noticed that SCs are generally more fragile or vulnerable in uncertain construction business environment, since they are in the downstream of construction supply chain, and their further development is greatly dependent on the fundamental accumulation on projects level (An

2011). Thus, to achieve a reliable production progress has a significant meaning for SCs. There exist many uncertainties threating a well ongoing construction process (Table 1).

Table 1: Major uncertainties within construction project process

Classification	Sources	Function
Natural uncertainty	Weather, geological conditions	f (weather, geological information)
Task uncertainty	Characteristic of small batch production, Learning curve problems	f (expertise, reliability of work plan)
Organizational uncertainty	Temporal organizations (tensions, opportunistic behavior, etc.)	f (project size, reliability of work relations)
Contract uncertainty	Estimated cost and actual cost (Associated with competitive tendering, etc.)	f (level of competition, size of firms, size of projects)

The causes could be mainly examined from external and internal levels. The following model is going to focus on the analysis of a major and commonly existing internal cause as the workflow reliability, a crucial issue concerned by GC and SC on project level. It can directly result in task uncertainty and contract uncertainty during the transaction process between GC and SC, the degree of which will become even bigger due to organizational uncertainty and natural uncertainty. In practice, it is commonly acknowledged to GC's project manager that project progress is largely dependent on the reliability of SCs' providing necessary resources at the right time, in the right quantity, and with the right skills, equipment, and so on. It happens frequently that project managers impute the project delay or budget overrun largely to SCs' failures to perform as expected. Unfortunately, they seem to ignore the impacts of the reverse relationship that SCs are also highly dependent on the predictability or reliability of work plan when allocating their resources.

3.2. Tentative Modeling on Resource Allocation between GC and SC

From above, striving for a reliable workflow could be a basic interest for involved parties. Instead of conventional risk transfer amid construction supply chain that could not eliminate potential waste or loss brought by workflow instability, there might be other better ways.

3.2.1. Scenario Setting

Given that the contract price between client and GC is reasonable enough so that GC does not have to worry about its payment by client. What GC should be concerned with is how to complete project work efficiently with well coordination by SC. Stability of workflow is then mainly influenced by the degree of work plan reliability by GC, and reliability in providing necessary resources by SC. Derived from Sacks (2004), SC's net income could be expressed as $I = Total\ Income - Total\ Cost = min\{k, q\}W_D(U - C_M) - kW_DC_S$. Here, $k=R_A/R_D$, in which R_A denotes the actual resources provided by SC, and R_D is the quantity of resources demanded by GC to complete the planned work; $q=W_A/W_D$, where W_A denotes the quantity of actual work made available, and W_D is the quantity of work demanded. Figure 3 shows the relations between SC's net income (I), resource allocating strategy (k), and GC's plan reliability (q). In this scenario, SC knows the unit price for the work set (U) in the subcontract, the unit costs of materials (C_M), and the cost of the resources per units of work

planned (C_S), and the quantity of work demanded (W_D) by project manager. The decision for SC is to set the value of k that will optimize its net income as its resource allocating strategy.

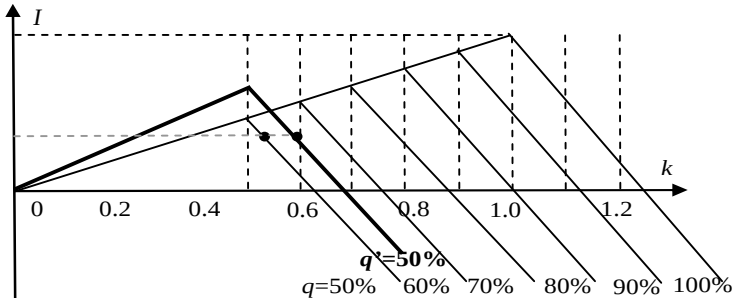

Figure 3: Relations between SC's net income, resource allocating strategy and GC's plan reliability

3.2.2. Discussions

As can be seen, SC's net income is dependent on the reliability of work plan by GC (q), resulting in SC's different behaviors when providing resource (k). As q declines, not only SC's expected income will be reduced, but the loss is more easily incurred (below the vertical axis). It could explain that SC is liable to providing fewer resources than demanded if the work plan is less reliable. From SC's perspective, CBS and non-trust work culture will lead to behavior like not to be honest. It is consistent with the prior perception that SCs tend to provide fewer resources demanded by project managers, such as cheating on labor and materials (jerry building). For a rational SC, they must try to estimate the value of q, and then choose resource allocating strategy more appropriately (i.e. $k = q$) to maximize income. However, the actual value of q occurs with uncertainty in practice. Since the value of q varies over the multiple planning periods, if a frequency distribution can be collected, then the expected value of q is possible to be estimated. It would be much beneficial for SC, but it could only happen during a long term working period. In practice, even if SCs could not get access to the records of the value of q for each project, they usually have a mental impression of the plan reliability in each project. As can be inferred, if there is a stable work relation, this kind of estimation could be more accurate and beneficial for SCs to allocate resources appropriately. Another interesting result is: the vulnerability of SC to the unreliability of work plan by GC could be influenced by subcontracting business scope. If SC supplies labor-only, the slope (the bold line in Figure 3) will become steeper. It means that SC becomes more vulnerable or sensitive to the degree of reliability of the work plan (q). On that occasion, with the same value of q, SC needs a bigger value of k to obtain the same profit. In other words, if SC supplies a significant proportion of the materials needed for the work, its vulnerability could be decreased. It is also consistent with prior knowledge that SC prefers more services like materials and equipment. By doing that, SC could be less influenced by insecure business, and enjoy a higher potential to gain profit.

4. CONCLUSIONS

Two labor management paradigms are analyzed in this paper. No matter informal '*baogongtou*' or formal LSEs, it is found that current subcontracting systems could not provide with economic incentives to fulfill their functions in improving labor employment and construction production. Hence, it requires a better understanding on their businesses involving various uncertainties. As the instability of jobs from construction contractors largely threatens the business running of LSs, the limitation on LSs' work scope to labor-service-only actually becomes a bottleneck for them to survive in construction market, no matter to say further development. Moreover, the unreliable working culture, widely existing in the Chinese construction industry, has aggravated the vulnerability of subcontractors. It in turn hinders GC's development as well. Thus, GC should recognize the increasing significance of LS's indispensable role in both fulfilling project objectives and improving laborer's situation. Two available approaches are put forward as enlarging LSs' business scope and promoting long-term relation between GC and LS. In future study, the approaches need more comprehensive evaluation, particularly on potential demerits. For example, if SCs are too much "locked in" vertical relations, it might easily lead to their inability to diversity and over-reliance. It reveals the significance of careful considerations on practical implementation.

5. ACKNOWLEDGMENTS

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