

# WHY DOES CHINA NEED RISK MANAGEMENT IN ITS CONSTRUCTION INDUSTRY?

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Construction has been perceived as a pillar industry in China's economic development. However, construction industry has a poor reputation for coping with risk, many projects failing to meet deadlines and cost targets. The construction industry suffers from more risk and uncertainty than most other industries. Risk management can help stakeholders in construction industry to avoid or alleviate these failures. Only if the need of risk management in construction industry has been identified, risk management can be effectively applied to Chinese construction industry.

Keywords: China, risks, risk management.

## INTRODUCTION

For most part of the last two millennia, China had the world's largest and most advanced economy. Then it missed the Industrial Revolution and stagnated. Since the late 1970s China's economic reforms have generated stellar growth, averaging 8 percent a year. The economy is fueled by enormous flows of foreign direct investment—the highest in the developing world. China has become a powerful and important player in the global economy, as well as an economic powerhouse in East Asia. Construction has been perceived as a pillar industry in China's economic revitalization (Han and Ofori, 2001). The central and local governments, which develop construction industries and drive the growth of the economy, have carried out policies and programs. In China, construction is defined as an industrial sector for material production, which creates buildings and other structures, and installs the related equipment. China's construction industry has undergone major changes in the last five decades, reflecting prevailing political and economic environments. China's construction industry is large. Rapid economic expansion in China (which, with an average annual growth rate of 11.6%, was the fastest growing economy in the world in 1991–1996) created high volumes of construction activity. Total investment in construction reached US\$188 billion in 1997 (US\$182 billion in 1996). Construction value added grew strongly, by 8% in 1997 and 12% in 1998, to reach US\$68 billion in 1998. The role of construction in the economy has been increasing: the proportion of value added in construction to GDP nearly doubled during 1978–1994. Employment in the industry in 1997 was 35 million (compared with 24 million in 1990). Chinese contractors are important players in the international construction market, as indicated in recent annual surveys by Engineering News Record.

The level of mechanization in China's construction industry has increased since the reforms began. In 1996 there were over 100 buildings, which were over 120 metres

high, and several major highway, energy and water projects had been constructed. From the Figure 1, we can see the construction market in China is vast and grows quickly.

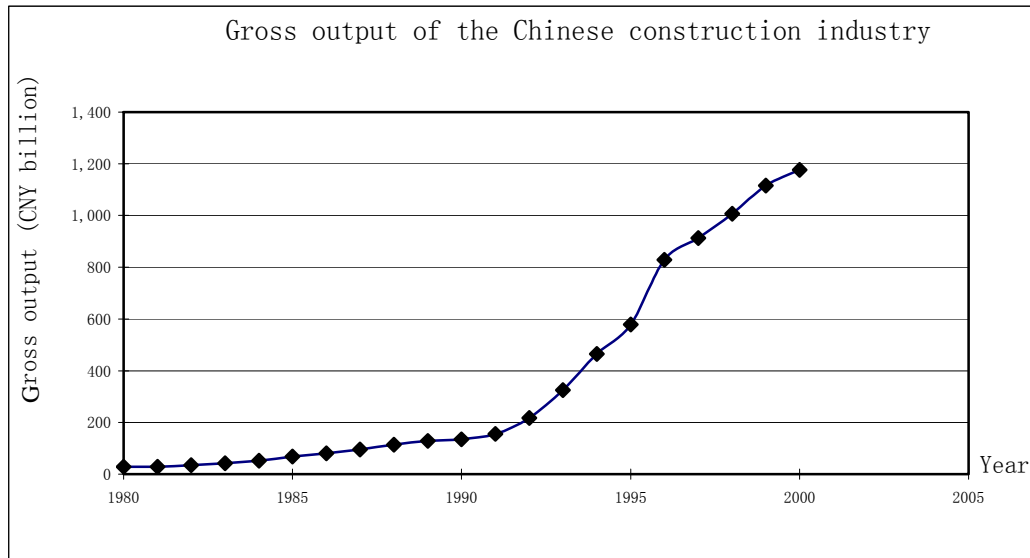


Figure 1 Gross output (current data) of the Chinese construction industry (1980-2000)

## CHANGE OF CHINESE CONSTRUCTION STAKEHOLDERS

There are several key stakeholders in Chinese construction industry, including government, clients, contractors and subcontractors, rural construction teams, foreign contractors, materials suppliers, consultants. The paper focuses on the change of government and state-owned sector.

### Chinese government

Before the 1980s, the Chinese government, under a “pure” socialist system, was the major or sole client for Chinese contractors, especially for large ones. The industry currently is becoming more market driven (Lan and Jackson, 2001). Government no longer assigns construction work to construction enterprises.

### State-owned sector

Being a socialist country, the state-owned sector still plays an important role in China’s economy (Lan and Jackson, 2001). Therefore, it is understandable that about half the construction market consists of clients from state-owned units. However, the dominance of this kind of client has been decreasing since the late 1970s, and clients other than state-owned units have increased steadily. Many Chinese clients from state-owned companies are not conscious of environmental control, quality control and risk control. This stems from a short-term planning horizon, which is also rooted in the “economic reform” in China. Market-embracing reform, having started in China in the late 1970s, effectively changed state-owned firms from being pure production units to being increasingly independent market players. Now they are partly responsible for their own profits and losses.

### Increasing competition

During the transition from a planned economy to a market economy, China has gradually loosened its control over construction enterprises (Lan and Jackson, 2001).

They have to hunt for work through market competition. Government no longer fixes construction costs. They are subject to the market fluctuations. All of these changes are mainly driven by deregulation and adoption of a “contracting system”, which separates ownership and management. However, reform in the China construction industry does not go much beyond these measures. Therefore, a new management regime is far from settled. At the present stage, contractors and subcontractors, which are defined as construction enterprises in China, are connected through a two-tier hierarchy.

The conditional opening of the construction market caused an inflow of foreign direct investment and foreign contractors who are targeting the top end of market. The loosening of control over the movement of surplus rural labours has generated a flood of rural construction teams. All these factors have increased competition in the industry.

## **THE URGENT NEED FOR CONSTRUCTION RISK MANAGEMENT**

Construction industry has a poor reputation for coping with risk, many projects failing to meet deadlines and cost targets (Thompson and Perry, 1992). Risks cannot be eliminated but, by applying the principles of risk management, practitioners are able to improve the effective management. Risks are generally regarded to lead project cost and/or time overrun and quality problems, extremely changing a potentially profitable investment into a loss-making venture. Chinese construction industry has experienced many significant structural changes over the last 25 years since economic reform. Many Chinese construction companies have become global and many new technologies are used into construction industry. Although construction companies have grown in size, competition has substantially increased. Because Chinese construction companies currently face two types of threats generated by new entrants in the industry. One is the penetration of foreign contractors with capital and superior technology into the top end of the market, especially after China entered WTO. The other competitor is the low cost, rural construction team entering into the lower end of the market.

### **Loss in Chinese construction industry from poor management**

Due to poor management level, low construction technology and a lot of risks, Chinese construction industry suffers from a huge deficit every year. Table 1.1 shows the loss of Chinese construction industry in 1998, 1999 and 2000 according to different type.

### **Competitiveness**

For many years, the construction industry in China has been controlled by the government and used to support China’s centrally planned economy (Mayo and Liu, 1995). Most construction projects have been financed by the government, designed by state-owned design institutes, and built by state-owned construction companies. This bureaucratic system, combined with the poor project-management skills of the enterprises, has resulted in low-quality work, cost overruns, and the late completion of projects. Since 1979, China has been reforming the country’s economy. Construction industry reforms were announced at the Chinese Party Congress Convention in October 1992. These reforms are designed to improve efficiency in the state-owned construction enterprise, to establish a construction market, and to make the Chinese

construction firms more competitive with international firms. The objectives of the construction reforms include the following (Mayo and Liu, 1995):

- Restructuring the industry's administration system
- Opening construction markets
- Allowing autonomy in state-owned construction enterprises
- Establishing a competitive bidding system
- Adopting professional construction management practices
- Improving project management skills

**Table 1:** The loss of Chinese construction industry in 1998, 1999 and 2000

Types of company	Gross turnover	Number of construction companies	Number of deficit companies	Deficit (CNY 10,000)	Deficit (%)
<b>2000</b>					
Whole construction companies in China		47,234	9,678	718,718	20.5
Sate-owned construction companies	48,614,000	9,148	2,496	444,775	27.3
Collective construction companies	37,563,929	25,286	4,300	116,891	17.0
Private construction companies	3,190,532	3,488	786	14,027	22.5
<b>1999</b>					
Whole construction companies in China		45,634	9,612	782,692	21.1
Sate-owned construction companies	43,423,557	9,218	2,639	522,210	28.6
Collective construction companies	37,641,754	26,818	4,772	163,358	17.8
Private construction companies	1,964,393	2,416	522	8,945	21.6
Joint-stock construction companies	15,068,049	5,741	1,143	59,142	19.9
<b>1998</b>					
Whole construction companies in China		41,114	5,884	491,183	14.31
Sate-owned construction companies	34,189,413	8,702	1,628	325,276	18.71
Collective construction companies	41,402,779	28,304	3,188	117,867	11.26
Private construction companies	448,828	838	156	3,486	18.62
Joint-stock construction companies	5,813,926	3,360	545	20,446	16.22

Hou, Jian in 1993, the Minister of the Construction, named 17 items in the agenda for future Chinese construction reform, two of which are: promoting the development of professional management; establishing effective methods to manage quality, scheduling, and cost control. Chinese government pays more attention than before to project management technology and knowledge to increase the competitiveness of construction industry.

### Knowledge competitiveness

There are three distinct views on competitiveness as follows (Wignaraja, 2003):

1. A macroeconomic perspective which deals with internal and external balance at country-level and focuses on real exchange rate management as the principal tool for competitiveness;
2. A business strategy perspective, which is concerned with rivalries between firms and countries and a limited role for public policies in fostering competitiveness;
3. A technology and innovation perspective that emphasis innovation and learning at the enterprise and national-levels and active public policies for creating competitiveness.

Technology has long been regarded as an important determinant of competitive advantage in world markets (Wignaraja, 2003). Knowledge and information are becoming the key drivers of international competitiveness and the global economy, making it crucial to respond rapidly and efficiently to changes. However China faces daunting internal challenges compounded by the knowledge and information revolution. Chinese construction industry should focus on developing technology and innovation to strengthen competitiveness. Partly as a result of a high growth rate, but also because of the knowledge revolution, China faces a period of wrenching and continual restructuring affecting all sectors, as noted in the tenth five-year plan.

### **International competitiveness**

To compete and prosper in this new environment, China has to open more and harness the forces shaping the global economy, leapfrogging to take advantage of rapidly evolving technologies. It must welcome the knowledge revolution, which, though it presents considerable challenges, also grants significant opportunities to improve China's development. Since China entered the World Trade Organization (WTO), the effective use of knowledge has become the most important factor of international competitiveness. This does not mean that China must simply develop high technology. It means that China must encourage its construction industry and people to acquire, create, disseminate, and use knowledge more effectively for greater economic and social development. The government must move farther from being a controller and producer to becoming the architect of a new socialist market and knowledge-based system, a system that is more self-regulating through appropriate market-supporting institutions. The doors are not yet completely open for foreign firms to compete in China, or for China to compete overseas (Mayo and Liu, 1995). China should utilize this period to improve the competitiveness of its construction industry.

### **Sustainable development in construction industry**

The construction industry, perhaps more than most, is particularly plagued by risk (Flanagan and Norman, 1993), but often this risk is not dealt with adequately, resulting in poor performance with increased costs and time delays (Thompson & Perry 1992). Construction projects are becoming increasingly complex and dynamic in their nature and the introduction of new procurement methods means that many contractors have been forced to rethink their approach to the way that risks are treated within their projects and organizations. The construction industry has often been accused of short-term goals with emphasis on higher margins and profits. Lack of investment in people, processes and technology is costing the industry from major contractors to specialist subcontractors. Dealing with variations on health and safety issues on an individual project is all very well but what about the less tangible issues? The risk of accepting the wrong client, tendering at lowest price, lack of succession

planning or destroying a brand - these issues have a much greater long term effect on the risk profile of a business. Lack of capacity in both the construction sector and in government, an uncertain economic environment, and lack of accurate data on which to base decisions, are identified as the main barriers to the realization of sustainable construction.

### **Construction risks in China**

The Chinese construction market will be the largest construction market in the world by 2020. China has huge requirements for infrastructure, housing, health care and education buildings. However, China has no background of risk management. The rapid expansion of the construction market in China parallels a growing demand for advanced construction technology and management. The construction sector in China is facing many new risks, including physical, financial, technical and operational risks.

## **PROJECT MANAGEMENT VERSUS RISK MANAGEMENT**

A broad definition of project risk is ‘the implications of the existence of significant uncertainty about the level of project performance achievable’ (Chapman and Ward, 1997). Risk can affect project performance. So risk management is the bedrock of the construction industry. However, the approach to risk management has not evolved, and now lags other industries in the sophistication of its risk identification, evaluation, mitigation and control. People, process and technology are three components of risk management. Inefficient and careless handling of risks decreases the profit of Chinese construction industry a lot. Unless effective action is taken to arrest the declining trend and to improve on the quality of risk management in China, the situation would worsen. Risk makes economic and project management more difficult for any entity. Risk management can be one of the most creative tasks of project management (Smith, 1999). Risk management is a particular form of decision-making within project management. Recent examples exist where the government has used the constructor’s proposed project management process and evaluation of candidate risks as a key source selection discriminator in competitive procurements. The difference between project success and disaster is of course more complex than managing or not managing risk, but it appears that the track record of successful projects would have been greatly improved if more companies had included risk as an integrated part of the project control and quality system (Smith, 1999). In China, risk management has successfully been used in other industries, such as insurance and stock market. Hopefully, risk management will be used into construction industry. Risk management can help construction industry reduce, absorb and transfer risk and exploit potential opportunities.

## **TYOLOGY OF CONSTRUCTION RISKS**

Construction is a high-risk industry without a very good track record of risk issues. The participants in the industry, as a result, have suffered from the agonizing outcomes of failure in the form of unusual delays in project completion, with cost surpassing the budgeted cost and sometimes failed to meet quality standards and operational requirements.

Construction risk is generally perceived as events that influence project objectives of cost, time and quality. Some risks involved in the construction process are fairly predictable or readily identifiable; others may be totally unforeseen. Typical risks

which may result in delays and/or increased costs to a contractor (Edwards, 1995) include:

(1) *Clients risks*

- Client cancels project
- Client delays start of project
- Client suspends works
- Client delays payments of certificates and claims
- Client delays taking over works
- Client insolvency leaves outstanding debts for work done
- Client insolvency gives receiver material on site for which suppliers have not been paid
- Deficiencies, errors, contradictions, ambiguities in contract documents, e.g. specifications and drawings
- Inadequate supply, quality, timing of information and drawings by client's designers, architects, etc.
- Unexpectedly onerous requirements by client's supervisors
- Unexpected inadequacy of pre-construction site investigation data in terms of interpretation or recommendations
- Unforeseen ground conditions
- Late project changes in size, scope
- Consequences of delays in interconnecting contracts, e.g. plant

(2) *Supplier/subcontractor risks*

- Supplier start delay
- Supplier poor performance, quality of materials, timing, delivery of information
- Subcontractor (nominated or otherwise) start delay
- Subcontractor poor performance, quality of materials, workmanship, design, timing, delivery of information
- Subcontractor insolvency

(3) *Constructional plant risks*

- Delay in availability of constructional plant
- Poor performance of constructional plant
- Breakdown of key constructional plant
- Lack of standby plant, spares
- Fall in expected resale values

(4) **Direct contractor risks**

- Shortages of experienced staff and labour
- Contractor start delay
- Contractor poor performance, inappropriate materials, workmanship, design, timing, management inefficiency
- Poor performance by any joint venture partners
- Liabilities for injury, damage or interference to persons or third party property on or off the site
- Responsibility to correct defects in the defects liability/maintenance period
- Long-term responsibilities for latent defects which become evident after the end of a contract

- Strikes, labour disputes
- Consequential losses, e.g. loss of profits arising from incidents
- Accident to key operatives, management staff
- Frustration of contract due to some fortuitous intervening event altering the nature of the contract to the extent that it can no longer be undertaken as intended
- Adverse weather
- Fire, theft, other physical risks
- Significant temporary and permanent works failures during construction due to design, materials or workmanship
- Unforeseen services, obstructions, contamination, ground conditions, water inflows, gases, vertical shafts, mine workings
- Archaeological finds
- Explosive finds
- Malicious damage, terrorism, war, civil commotion
- Contractually defined 'excepted risks' occurring
- Unforeseen events and delays not allowed for in tender

(5) *Financial risks*

- Inadequate tender pricing
- Unexpected price escalations not covered/covered by contract clause
- Statutory pay increases, tax increases, etc.
- Devaluation
- Financial constraints on ability to meet payments to others

(6) *Third party risks*

- Statutory changes affecting construction, e.g. health and safety requirements
- Failure to obtain planning consents, easements, etc. in time allowed
- Unexpected difficulties as a result of interface with third party utilities and others
- Unexpected difficulties as a result of need to liaise with other contractors on site
- Delays in approvals by engineer, client, local authorities
- Local environment pressure groups
- Damage to works by third parties

(7) *Overseas risks*

- Overseas skill/supervision shortages
- Overseas plant, spares and material shortages
- Local customs
- Import/export difficulties
- Exchange control restrictions
- Unexpected exchange rate movement
- Bureaucratic delays
- Remoteness of site access and/or facilities and/or communications

(8) *Litigation/arbitration risks*

- Delay on resolving litigation/arbitration disputes
- Uncertainty of result disputes
- Unfavourable decisions



- Costs of legal process

## **BENEFIT OF RISK MANAGEMENT**

Risk management is not about predicting the future, but understanding a project and making a better decision regarding the management of that project tomorrow (Smith, 1999). In project management terms, the most serious effects of risk can be summarized as follows: failure to keep under the cost estimate; failure to achieve the required completion date; and failure to reach the required quality and operational requirements. Risk management can help stakeholders to avoid or alleviate these failures. The benefits of risks management can be summarized as follows:

- Project issues are identified, understood and taken into consideration from the start;
- Decisions are supported by thorough analysis;
- The definition and structure of the project are continually monitored and controlled;
- Clearer understanding of specific risks associated with a project;
- Development of historical data to help future risk management procedures;
- Improve project management experience and communication.

## **BARRIERS TO RISK MANAGEMENT IN CHINA**

Although risk management can be attractive for Chinese construction companies, only a few have actually used such techniques and instruments. The reason for this may be that Chinese construction industry faces barriers. Project success does not just happen. There are many risks that can lead to the project to miss its key objectives of cost, time and scope. Sadly, most Chinese construction companies do not know much about risk management and do not even attempt to practice it. Many Chinese construction companies are familiar with risk management but few can understand its contribution to good project outcomes. They are not good at practicing risk management because of ingrained habits; prejudices and attitudes that frustrate risk management. Even so, some other companies do understand project risk management and try to establish the conditions under which they will succeed in applying it to their projects.

Unfortunately, they find that cultural behaviours and barriers to risk management are very difficult to overcome. The importance of risk management has been widely recognized in industrialized countries, but, in China, its application has been limited. This is partly because there are barriers to the introduction of risk management techniques. The construction industry suffers from more risk and uncertainty than most other industries. Unfortunately, the majority of project managers have not yet understood that it is necessary to regard project risks as a management issue because most of them think risk cannot be controlled. Furthermore, they do not believe in risk management. What they can do is just use their experience to decrease the loss from risks. They never consider using some kinds of technology or tools to manage risks in construction. The main difficulties in applying risk management in the Chinese construction industry can be summarized as follows:

- There is no standard procedure for collecting information; There is little perception about what risk management is and what results it can yield;
- Practitioners think that the elaborate network of personal relationships is much more significant than risk management;
- China has well educated people who are reluctant to make decisions;

- Poor understanding by the general practitioner is a great barrier to accept risk management conception in the construction industry.

Even though better external risk management can help China in the construction industry, it can be done effectively only when some key conditions are fulfilled. Risk management techniques are sophisticated and, if used inappropriately, can be costly.

## **CONCLUSION**

Construction industry develops very quickly in China. However, Loss in Chinese construction industry from poor management becomes a very important and urgent problem. Furthermore, the competition in Chinese construction industry increases greatly. It's very important to improve competitiveness of Chinese construction industry. Risk management in construction industry can help control the cost estimate, achieve the required completion date and fulfil the required quality and operational requirements.

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