

Contractors’ practices in bidding processes: a comparative study between China and Sweden

Jun Ying Liu

*Associate Professor, Tianjin University, Tianjin 300072, P.R. China
liujunying@gmail.com*

Per-Erik Josephson

*Professor, Chalmers University, Gothenburg, Sweden
Per-Erik.Josephson@chalmers.se*

Shu Rong

*Research student, Tianjin University, Tianjin 300072, P.R. China
rscv76@gmail.com*

Abstract

Adopting formal and analytical models to assess and price project risk at the tender stage to practice is challenging due to the lack of improved understanding of the actual process on how contractors decide to bid or not. The aim of this paper is to investigate how the bidding process is organised and managed in large and medium-sized construction companies, with a focus on how risks are considered when deciding whether to bid or not as well as on deciding price level. The paper is further a benchmark between how the process is organised in Chinese and Swedish construction companies, since it is believed that there are significant differences based on, among others things, cultural issues. Interviews are made with managers within two Chinese companies and two Swedish companies. Among issues covered in the interviews are those of who are involved in the process, the structure of meetings, how decisions are made and project preferences. The study is expected to increase the understanding of the context of decision-making in the bidding process.

Keywords

Risk management, risk behaviour, decision-making, construction projects, tendering

1. Introduction

The construction industry is characterised by high uncertainty (Klein and Gulati, 2004). Decision-making under risk is common (He and Huang, 2008), Among all risks in decision-making, to bid or not to bid for construction projects is a crucial strategic decision for contractors’ sustainability in the industry. (Jarkas *et al.*, 2013). Both Chinese contractors from a developing country and Swedish contractors from a developed country are major players in the global market. By comparing their practices in bidding processes, this study aims to identify similarities and differences. Contractors in European countries spend up to 5% of their turnover on tendering processes (Josephson and Saukkoriipi, 2007), while this information cannot be found for Chinese contractors. The hit-rate, i.e. the ratio between number of awarded contracts and number of contracts being bid for varies depending on the contractors’ strategy. Contractors bidding on many contracts may have a hit-rate of 10% while other contractors prioritising on

fewer contracts may have a hit-rate of 50% or more. All these companies face, however, the same challenge: which contracts to bid on and which contracts to not bid on. There are several studies on factors considered when making the bid/no-bid decision (Bageis and Fortune, 2009; El-Mashaleh and Mohammad S, 2010), but not much published on how the decision is made, especially not who is involved in the decision process and how these individuals make a group decision. The aim of this paper is to describe contractors' processes for, firstly, deciding to bid or not bid and, secondly, deciding price. Questions include those such as who is involved in the decision process and how risks are identified and evaluated. The study is further a comparison between the processes in two Chinese construction companies and two Swedish construction companies. A motive for comparing these two countries is the extreme differences. The Chinese construction industry has experienced rapid development, especially for their overseas businesses, since China joined the World Trade Organization in 2001, and the Chinese government implemented the "Going-Out" strategy (Liu *et al.*, 2013). The Swedish construction industry has been more stable over the last few decades (Bröchner *et al.*, 2002). In Sweden, public projects follow the Procurement Act. Hence, all bids become public, which makes it possible to learn competitors' strategies.

2. Theoretical framework

Compared to individual decision-making under risk, with more information and viewpoints from more participants, group decision-making under risk can reduce the decision deviation to a great extent (Surowiecki, 2005). Organisations frequently require decisions to be made by a cooperative group, which is known as group decision-making (Zhang and Lu, 2003). Groups are expected to produce decisions of higher quality and with greater acceptance by their members (Hinsz, 1999).

A lot of efforts have been paid has been put into the research of group decision-making and this is an area connected closely to the area of psychology. One or more baseline models were used to predict the group's product under certain process assumptions (L.Kerr and Tindale, 2004). The social decision scheme theory known as SDS can be viewed as the foundation of group decision-making in the field of psychology (Davis, 1973). The social decision scheme is a rule or procedure by which the group combines a distribution of member preferences in a collective group response decision-making and influential factors (Laughlin, 2010). However, the precondition of these researches is risk free. It is important to improve the framework to address decision-making under risk.

Decision-making under risk can be viewed as a choice between prospects or gambles (Kahneman and Tversky, 1979). And bid or not is a crucial strategic decision for contractors in construction industry. There are some potential influential factors that may affect bidding decision-making. Risk preference and risk perception have a close relation with decision-making (Abdellaoui *et al.*, 2011; Keil *et al.*, 2000). Besides this, culture also has an influence on decision-making (Bodycott and Lai, 2012). In a widely used culture model—Hofstede's model of national culture—five dimensions are used to describe the characteristics of different cultures. These are power distance (PDI), individualism & collectivism (IDV), uncertainty avoidance (UAI) and masculinity & femininity (MAS), long- versus short-term orientation (LTO) (Hofstede *et al.*, 2012). Each of these factors has a relationship with decision-making (Bredillet *et al.*, 2010; Chui *et al.*, 2010; Griffin *et al.*, 2012; Hofstede *et al.*, 2012). This study is designed to explore contractors' practice in the bidding process, and make a comparison between Chinese and Swedish contractors to identify influential factors of bidding decision-making.

3. Method

The study is based on four cases: two Chinese contractors and two Swedish contractors. The Chinese contractors are large state-owned companies, who mainly focus on the overseas market. Their bidding decision-making process is mature and considered as being representative for Chinese contractors. The

two Swedish contractors are private owned. One is a large nation-wide contractor, while the other is a medium-sized regional contractor. These are considered as being typical for Swedish contractors. One semi-structured interview was held in each company. In case A, the vice-general manager of Legal and Risk Department was interviewed at his office for 45 minutes. In case B, the vice-general manager of the company was interviewed at his office for 30 minutes. In case C, one calculation manager and one project manager were interviewed at their local office for 60 minutes. In case D, the division manager of construction activities was interviewed at the main office for 30 minutes.

4. The bidding process

Here is the comparison of basic information of the four cases shown in Table 1 before detailed introduction of bidding process.

Table 1 Comparison of basic information between the four Cases

Items	Case A	Case B	Case C	Case D
Turnover	\$7 billion	\$4.5 billion	€25 billion	€40 million
Company type	State-owned	State-owned	Public company	Family-owned company
Main market	China & Africa	Africa	Scandinavia	Europe
Project type	Nearly all types	Road and bridge	Nearly all types	Nearly all types
Hit-rate	20%	17%	20%	25%

Case A mainly focuses on overseas projects. Profit has highest priority followed by an eagerness to expand its influence in the global market. The bidding work is divided into four steps. The first step is market research. This work starts after they get the bidding information. It involves collecting information from the local department of their company or the adjacent department of their group company. If they have completed at least one project in this district in the past, it will shorten time on this work. Otherwise, it must be addressed very carefully, and will take about three or four weeks. The second step is to carry out a project review. It aims to form a preliminary judgment on whether the political status and security situation of this area are acceptable for bidding and to check out whether they have enough technical support and related personnel. The third step is cost calculation and risk analysis. It is an important step for the company. A range of three weeks to seven months may be taken to finish this work, based on the size of the project. This step mainly focuses on new market, and checks out whether any risks exist which they cannot control, and whether they have to get guarantees, such as the guarantee from local national government. Finally, there will be two or three decision-making meetings to decide whether to bid or not and to decide the bidding price. The meetings mainly include two parts; cost examination and approval, and analysis of bidding strategy, to check out whether they can get a reasonable profit if they bid and confirm what strategy they should choose, such as bidding at a low price for taking over the new potential market, raising the price of the earlier construction phase and reducing the price of the later construction phase for getting interim payment earlier.

Case B is a wholly-owned subsidiary of a major company. Their primary goal is to guarantee the interests of all the shareholders and make a satisfying profit. Their work is conducted in the following steps. The first step is to check out whether the projects under construction have enough personnel and technical support. Since this company has many projects in Africa, which are aiding China, they usually make a reasonable profit. All they have to do is to finish those projects in a proper way. If they think they have surplus capability, they start the second step, which is identifying and selecting appropriate projects. At this stage they take political environment, security problem, working conditions and other issues into account. After analysing these issues, they are more likely to select large projects. The third step is to calculate the cost. If the project is regarded as “small”, which means the quote is under \$1 million, they estimate the cost roughly in two or three days. The estimated cost multiplied by 1.5 is then used as the

bidding price. In this case there is no step four. If the project is regarded as “large”, they spend three weeks to two months carefully calculating the cost. The final step is decision-making meetings. The general manager and the leaders of the development department, project management department and finance department participate in these meetings. Because these projects are constructed overseas, they cannot take every risk into control. So they have to raise the bidding price to cover these risks and this work has to be done by department leaders. At the same time, the general manager has to keep their price competitive, so he has to pull down the price. Once they reach a consensus, the bidding price is confirmed.

Case C is the fourth largest construction company in Scandinavia. They express their responsibility for societal development and their high ambitions on financial goals as well as on health and safety and environmental aspects. The region, which is studied in this paper, has formed a group which follows the market, identifies coming projects, discusses them and makes decisions on which projects to calculate on and later on, which to bid on. The main decision is, however, made when they begin to calculate. If they calculate, they normally submit a bid. This group, which meets every week for one hour, consists of the regional manager, the calculation manager, the purchasing manager and three project managers. A major part of the work is to send enquires to potential subcontractors and get offers from them. The calculation manager makes cost estimates together with four other estimators. When deciding, they also look at the group of estimators’ capacity, the time available as well as their competence in specific kinds of projects. Factors that influence the decision to calculate include whether they know the client organisation, whether the kind of project fits into the plan, if they have the competence for the type of project and if they have the right project organisation available when the project is expected to begin. They explain that “it’s always a gamble, because we never have the full information and don’t know whether we get the project or not”. They always aim to make a correct calculation, i.e. not adding for risks, during the calculation. The ones who speculate are the region manager, the calculation manager and the project manager when deciding the exact price. For projects over €10 million, the decision is however made by the CEO. They prioritise repeating customers and consider avoiding certain customers. Then it’s seldom the client organisation, rather the individual project manager in the client organisation. It happens that the client organisation is good, but the project manager is not.

Case D is a regional, family-owned company. They describe themselves as a local company with capacity to compete with the largest contractors on most projects. Their strategy for developing closer collaboration with clients. They always prioritise profit, not turnover. It’s important for the owners to keep the size of the company and hand over a good business to the next generation in the family. Short-termism does not exist for this reason. They bid for €200 million per year and win 30% without competition. Sometimes the property owner asks them to calculate on a project, and then they get specifications. Also, very often when clients contact them, they come back because they are satisfied with previous projects, and many projects are based on repeated contacts. They have formed a group, including the division manager, responsible for all construction activities, the calculation manager and three project managers, who have meetings every second week to follow up on potential projects. For each potential project the group decides whether to calculate or not. Then they have another two or three meetings during the calculation process to follow up the work and to discuss new information. The offers from potential subcontractors come later. It has become a tradition to submit the offer on the last day. The division manager makes the formal decision, but bases his decision on discussions in the group. The CEO is involved in larger projects, however, they seldom disagree on projects. When they disagree it is generally about how they experience the competence and behaviour of the client’s project manager. The risk is especially high in renovation projects, since the building’s condition is not fully known. It’s common for costs to increase by 5-10% on these projects. Other risks they consider are logistics for projects in city centres, the foundation work since clay is common and the client’s organisation and its financial situation.

5. Discussion and concluding remarks

Based on these four cases, characteristics of practices in bidding processes are shown in Table 2. When the two are compared, there are more differences than similarities. In Chinese companies, the general managers will always attend the group meeting, but in Swedish companies, they may not. This difference is influenced by the different culture between China and Sweden. In China, the authority is relatively centralised, and many people have a traditional concept of authority, which is waiting for instructions from superiors. This is in line with Hofstede et al. (2012) results, which show that the power distance in China is very high.

Table 2 Comparison of bidding processes between Chinese contractors and Swedish contractors

Items	Chinese contractors	Swedish contractors
Risk preference	Avoiding risks normally, but accepting some risks in some conditions	Avoiding risks
Bidding projects	Completing projects aiding China first, then following market	Following market
Decision-making time	After calculation	Before calculation
Decision-making process	Group decision-making processes, built on consensus	Group decision-making processes, built on consensus
Decision-making personnel	General manager and leaders of all departments	Region manager, project manager and calculation manager
Decision-making software	No software needed	No software needed

The attitudes towards risk between the two countries are diverse. The reasons for this difference mainly come from risk perception and risk preference. These two factors play a crucial role in individual decision-making under risk, and they also have an influence on the people in group decision-making. In these cases, Chinese contractors accept some risks in some conditions but Swedish contractors do not. The Chinese contractors construct projects aiding China, which are government support, or they may seek national support. So their acceptance of risk is higher and they have to guarantee the satisfactory completion of projects aiding China first of all, and then follow the market.

Another difference is the decision-making timing. Chinese contractors make decisions after the cost calculation, but Swedish contractors do this in reverse. This is mainly because in these cases, clients contact Swedish contractors and many of them are acquaintances whose reputation is credible. So they can confirm bidding firstly, and then calculate the price. But Chinese contractor win projects through attending open tendering in which the bidding price is quite a significant factor, so they have to calculate the cost carefully before their decision.

There are two obvious similarities, which are the decision-making process and the fact that no software is needed. The four cases all use the group decision-making process. This proves that the group decision-making is appropriate for contemporary project bidding decision-making. Compared to individual decision-making, it surely has its own advantages. In the group meeting, they use no software either. This could be for two reasons; one is that in the bidding decision-making, there are too many factors that should be considered, and many of them are uncertain. The other is that the companies have experienced decision-makers who are familiar with local situations, so they can give their integrated suggestions.

From the comparison of these four cases, we distinguish the similarities and differences between Chinese contractors and Swedish contractors. Where do these differences come from? On the outside, we may see the differences in culture and the way of thinking, but on a deeper level, the reasons for those differences mainly come from power distance, risk perception and risk preference through our analysis. Besides these, other factors in Hofstede's national culture model and psychology factors may also have influence on bidding decision-making in other aspects, and these factors are worthy of further research.

Acknowledgments: The authors would like to acknowledge the support from the National Natural Science Foundation of China, which funded this research (Project Number 71202084).

6. References

- Abdellaoui, M., Diecidue, E., and Onculer, A. (2011). Risk Preferences at Different Time Periods: An Experimental Investigation. *Management Science*, Vol. 57, No. 5, pp 975-987.
- Bageis, A. S., and Fortune, C. (2009). Factors affecting the bid/no bid decision in the Saudi Arabian construction contractors. *Construction Management and Economics*, Vol. 27, No. 1, pp 53-71.
- Bodycott, P., and Lai, A. (2012). The influence and implications of Chinese culture in the decision to undertake cross-border higher education. *Journal of Studies in International Education*, Vol. 16, No. 3, pp 252-270.
- Bröchner, J., Josephson, P.-E., and Kadefors, A. (2002). Swedish construction culture, management and collaborative quality practice. *Building Research and Information*, Vol. 30, No. 6, pp 392-400.
- Bredillet, C., Yatim, F., and Ruiz, P. (2010). Project management deployment: The role of cultural factors. *International Journal of Project Management*, Vol. 28, No. 2, pp 183-193.
- Chui, A.C.W., Titman, S., and Wei, K.C.J. (2010). Individualism and momentum around the world. *The Journal of Finance*, Vol. 65, No. 1, pp 361-392.
- Davis, J.H. (1973). Group decision and social interaction: A theory of social decision schemes. *Psychological Review*, Vol. 80, No. 2, pp 97-125.
- El-Mashaleh, Mohammad S. (2010). Decision to bid or not to bid: a data envelopment analysis approach. *Canadian Journal of Civil Engineering*, Vol. 37, No. 1, pp 37-44.
- Griffin, D., Li, K., Yue, H., and Zhao, L. (2012). How Does Culture Influence Corporate Risk-Taking? Online at <http://ssrn.com/abstract=2021550>.
- He, Y., and Huang, R.H. (2008). Risk attributes theory: decision making under risk. *European journal of operational research*, Vol. 186, No. 1, pp 243-260.
- Hinsz, Verlin B. (1999). Group decision making with responses of a quantitative nature the theory of social decision schemes for quantities. *Organizational Behavior and Human Decision Processes*. Vol. 80, No. 1, pp 28-49.
- Hofstede, G.J., Jonker, C.M., and Verwaart, T. (2012). Cultural differentiation of negotiating agents. *Group Decision and Negotiation*, Vol. 21, No. 1, pp 79-98.
- Jarkas, A.M., Mubarak, S.A., and Kadri, C.Y. (2013). Critical Factors Determining Bid/No Bid Decisions of Contractors in Qatar. *Journal of Management in Engineering*, Doi: 10.1061/(ASCE)ME.1943-5479.0000223.
- Josephson, P.-E., and Saukkoriipi, L. (2007). *Waste in construction projects: Call for a new approach*. Chalmers University of Technology, Goteborg.
- Kahneman, D., and Tversky, A. (1979). Prospect Theory An Analysis of Decision under Risk. *Econometrica*, Vol. 47, No. 2, pp 263-292.
- Keil, M., Wallace, L., Turk, D., Dixon-Randall, G., and Nulden, U. (2000). An investigation of risk perception and risk propensity on the decision to continue a software development project. *Journal of Systems and Software*, Vol. 53, No. 2, pp 145-157.
- Klein, W.A., and Gulati, M. (2004). Economic Organization in the Construction Industry: A Case Study of Collaborative Production under High Uncertainty. *Berkeley Business Law Journal*. Vol. 1, No. 1, Article 5.
- L.Kerr, Nobert, and Tindale, R. Scott. (2004). Group performance and decision making. *Annual Review of Psychology*. Vol. 55, pp 623-655.
- Laughlin, P. R. (2010). Social choice theory, social decision scheme theory, and group decision-making. *Group Processes and Intergroup Relations*, Vol. 14, No. 1, pp 63-79.
- Liu, J.Y., Zou, Patrick XW, and Gong, W. (2013). Managing Project Risk at Enterprise Level: Exploratory Case Studies in China. *Journal of Construction Engineering and Management*. Vol. 139, No. 9, pp 1268-1274.
- Surowiecki, J. (2005). *The Wisdom of Crowds*. Anchor, New York.

Zhang, G.Q., and Lu, J. (2003). An Integrated Group Decision-Making Method Dealing with Fuzzy Preferences for Alternatives and Individual Judgments for Selection Criteria. *Group Decision and Negotiation*. Vol. 12, No. 6, pp 501-515.