Abstract

Procuring buildings is different from procuring goods. In procuring goods, a buyer can benefit from price competition even for inferior goods with questionable quality. The scenario is different in the construction industry. The term “procurement system” which is different from “procurement contract” has been closely associated with procuring materials or buildings. The use of different terminologies motivates this study to look closely at the definitions of these terms. The literature shows that the terms “procurement system” and “procurement contract” are used interchangeably especially in the Western countries, but the term “procurement system” is more widely used by industry players in Malaysia. Despite the various terms used for “procurement contract”, in most countries, “fixed price” (FP) procurement contract has been more extensively used in the construction industry compared to “cost reimbursement” (CR). Besides, the concept of procurement contract as FP and CR, mainly used by Western economists, is also explored.

Keywords: procurement system, procurement contract, fixed price, cost reimbursement, construction industry

1.0 Introduction

The term “procurement system” has been viewed upon in various ways. For example, Ashworth (1991) considers the type of contract, obligation rights, and liabilities of the parties involved, whereas Turner (1990) provides a simpler concept as the construction constituents of three important parties, namely the client, consultants, and contractors. In contrast, Gould (1997) defines procurement contract as an agreement between two or more parties who agree to provide goods or services. The concept shows that the term “contract” is one of the specific categories under a procurement system. However, there is a conflicting literature, wherein procurement contract terms such as fixed contract, cost reimbursement (CR), price-in-advance (PA), and C+ have been considered as types of procurement system. However, only a limited number of industry players actually use these terms. Observations and surveys in the industry reveal that the term “procurement system” is referred to only as either traditional or modern system. For example, based on the latest survey by the Chartered Institute of Building UK (CIOB) in 2010, the term “procurement system” is widely used but is still not fully understood by the industry player.
Procurement contract is the main issue of project development, which looks into the transaction involved. The difference in procurement contracts lies on the determination of payment for the parties involved (Kumaraswamy and Dissanayaka 1998). The procurement of manufactured goods is straightforward, whereas that of buildings or construction projects requires different procurement contracts depending on project type, price, and complexity.

Building construction is unique. According to Bajari and Tadelis (2001), construction projects involve uncertainty such as design changes occurring after the contract has been signed, design failure during construction, unanticipated site, unforeseen environmental conditions, and changes in government’s regulation. These changes would disrupt the main construction schedule and impact the contract signed between the main contractor, supplier, and subcontractor. If, during the earlier stage, the contractor was given a certain date of completion, the changes would certainly have a domino effect throughout the project’s completion period because all of the construction activities are highly correlated.

However, procurement is not a small issue. In the U.S., federal, state, and local government procurement used by the public sector accounts for at least 10% of the Gross Domestic Product (Laffont and Tirole, 1993; McAfee and McMillan, 1986). In addition, numerous private sector transactions are also governed by procurement contracts such as those involving electronics components, custom software, automobile production, and building construction.

The literature review aims to explore the definitions of “procurement system” and “procurement contract” as mentioned. The different opinions and views about the categorization of procurement system and procurement contract have been acknowledged as a fundamental issue that needs to be highlighted in this paper. The literature shows that both terms are used interchangeably especially in the Western countries, but only the term “procurement system” is more widely used in Malaysia. Despite the various terms used to define procurement contract in the Western countries, the term “fixed price” (FP) procurement contract has been more extensively used in the construction industry compared to “cost reimbursement” (CR). Besides, the concept of procurement contract such as FP and CR, which is mainly used by the Western economists, is also explored.

2.0 Procurement system and procurement contract

2.1 Definition of procurement system

Previous research defines procurement system in many ways, including as process, strategy, and parties involved. For example, Ashworth (1991) defines procurement system by relating it to the type of contract, obligation rights, and liabilities of the parties involved, that is, between clients, consultants, and contractors. Rashid et al. (2006) describe “procurement” as being derived from the word “procure”, which literally means “to obtain by care or effort”, “to bring about”, or “to acquire”, and from “system”, which means “organized method, technique, approach, process, or procedure”. The combination of these words gives rise to the meaning “procurement system” which denotes “organized methods or processes and procedures of obtaining or acquiring a construction process product such as house, shopping complex, or road”. This phrase can clearly depict the scenario in which the process involves a group of people brought together and systematically organized in terms of their roles, duties, responsibilities, and interrelationship among each other in “acquiring” a building.

The above discussion supports the definition given by Turner (1990), who defines procurement as simply construction constituents of three main parties, namely client, consultants, and contractors who
work together to provide a practical guidance on the decisions for choosing the actual procurement route. Research development in procurement shows that three main procurement systems normally used are traditional, design, and build, as well as management system (Love et al., 1998) in the US (El Wardani et al., 2006; Hale et al., 2009), China (Smith, et al., 2004), and Saudi Arabia (Alhazmi and McCaffer, 2000). Hashim et al. (2006), Rashid et al. (2006), Seng (2006), Ismail et al. (2006), and Adnan et al. (2008) also identify similar scenarios in the Malaysian construction industry.

2.2 Definition of procurement contract

Procurement contract, or simply contract, has been defined by Gould (1997) as an agreement between two or more parties who agree to provide goods or services. The type of contract is important to the owner for its ability to address project risks. Gould (1997) classifies the many categories of the contract as single FP, unit price, and C+ fee.

Procurement contracts take on various forms. Rogerson (1992) describes four distinct types of contract commonly employed by the US Department of Defense:

(1) Pure fixed price (PFP) contracts in which the supplier receives a single and fixed payment for the procured item regardless of the supplier’s realized cost.

(2) Pure cost reimbursement (PCR) contracts, in which the payment made to the supplier is precisely the supplier’s realized cost of producing the item.

(3) Incentive fixed price (IFP) contracts, in which the payment to the supplier increases with the realized cost up to a threshold cost level, and then capped at this level.

(4) Incentive cost reimbursement (ICR) contracts, in which the payment to the supplier again increases with the realized cost up to a threshold, and then reflects the realized cost exactly above the threshold.

However, the terms have evolved. Interestingly, according to Bajari et al. (2006), there are hybrid contracts between FP and C+ types called “unit price” contracts. Examples are public highway construction contracts from Northern California with a total value of USD2.2 billion.

3.0 Development of procurement contract

The literature shows that, in the U.S., the term or practice of procurement system and procurement contract are often mixed up. For example, Freeman (1981) indicates that the lump sum system is widely used and remains to be the traditional procurement system in the U.S. Barrie and Paulson (1992) identify the various arrangements under this system and suggest that it may be implemented by either "using the single fixed price or lump sum contract, a unit price contract, a negotiated cost plus fixed fee contract, or a guaranteed maximum price arrangement” (p 28). According to Hill (1979), this approach is particularly used on majority of small- and medium-sized projects, suggesting that it is therefore the most widely used system in the U.S.

However, in the U.K., Harris, et al. (2005) identify seven types of individual contracts: lump sum, bill of quantities, schedule of rates, fixed or percentage fee, CR, target cost, and direct cost. In different cases, Carty (1995) identifies five different types of construction contracts: lump sum, unit price, guaranteed maximum price (GMP), cost reimbursable, and construction management involving varying levels of risk. Gould and Joyce (2003) further sub-classify the contracts under a few categories, as follows:

a) Fixed price (FP) type of contracts
b) Cost reimbursement (CR) types of contracts
c) Miscellaneous type of contracts
Interestingly, Haider (2009) points out that construction contracts are formulated in various ways, such as FP contracts and C+ contracts. For contractors, reimbursable cost contracts are the least risky while GMP is the most risky.

Gil and Oudot (2009) and Bajari et al. (2009) prove that complex projects adopt CR contracts more often than FP contracts. Corts (2012) examines the consequences of the opportunistic behavior of relational contracting in CR versus FP contracts. He highlights the role of future interactions for the provision of efforts in otherwise apparently low incentive provision scenarios. Future interactions between buyers and sellers may deter any informational abuse as described by Bajari et al. (2009), Goldberg (1977), and Guasch et al. (2006), as well as possibly allow buyers to minimize transaction costs. However, Gil and Oudot (2009) implicitly assume that CR contracts experience ex-post renegotiations more than FP contracts but cannot demonstrate so due to the lack of information on ex-post payments.

In the U.K. construction industry, the value of traditional contracts plummeted to 36.8% in 2004 from 79.9% in 1985. This decrease was due to the substantial decline in the use of lump sum–firm bill of quantities by about 30% from the 1985 survey. The lump sum–firm bill of quantities surged after 2001, prompting a comeback or reverse-in trend. The 2001 survey recorded over 20% use of lump sum–specification and drawings, but this took a nosedive to 10.7% in 2004 (Oyegoke et al., 2009 and Oyegoke et al., 2008). Cost reimbursable contracts have grown in value from its 5.2% peak in 1987 to almost 12% in 2004. The most remarkable cost reimbursable contract type is target contract, with about 11% contract value in this category.

4.0 Procurement system versus procurement contract

According to Hartman and Snelgrove (1996), FP covers any contractor’s effort necessary to achieve the targeted results. This means that a contractor bears the risk because the actual required effort may differ from the planned effort. An FP contract, sometimes called hard money contract, is characterized by a pricing mechanism that has no provisions for changing the price stated in the contract. Pond (1996) has reported that 88% of all heavy construction projects falls under this category. Depending on the object for which an FP is stated, one can distinguish between lump sum contracts, unit price contracts, and price list contracts.

Under the FP arrangement, a contractor consents to execute the entire work described or specified for a stated total sum, which is normally based on information derived from drawings, specification, bills of quantities, and/or site inspection. The contractor then considers all contractual risks involved, the conditions of the construction market, and his current workload to arrive at the pre-estimated price. This price is paid to the contractor regardless of the actual costs incurred in work execution, provided that there are no variations (Kwakye 1997). However, a new system to cope with industry changes emerges. Turnkey or design-and-build may be defined, in pure form, as “a single source of contract with an FP for the design, procurement, construction, and commissioning of a facility in line with the owner’s intentions” (Bahari, 1986, p. 54). The popularity of this approach in many emerging nations arguably stems from the system’s ability to complete projects with a greater speed than the traditional approach at FP (United Nations Centre on Transnational Corporations, 1989). The enterprise (main contractor) agrees to undertake the project for an FP and is responsible for the overall site management and coordination of various trades, thus acting as the pilot of the project (Meikle and Hillebrandt, 1989).

The lump sum procurement system is largely used by the public sector in the military engineering services department (Singh and Sofat. 1977; Mohan and Sofat. 1987; Guha Thakurta, 1990; and Dala, 1992). In this
system, the contractor is required to agree to an FP based on full contract documentation, drawings, plans, specifications, and other construction details in advance of the actual work. Panchadari (1992) points out that design and build (turnkey) contracts are increasingly being adopted in the Indian construction industry. Under this system, a single contractor is responsible for completing the full design and construction of the proposed building.

The lump sum contract requires a contractor to provide an FP to the owner to do all the work required by the agreement (Kaplanogu and Arditi, 2009). A lump sum contract can only be executed when the scope of work is clearly defined and understood by all parties. This type of contract offers the owner the best protection relative to the price the owner will pay for the work, but it is risky for the contractor. Thus, the current practice that uses either the traditional or modern procurement system with an FX set in advance falls under the FP contract.

5.0 Procurement contract from the economics point of view

Transaction cost economics (TC Page 5 common theoretical framework for investigating procurement and inter-organizational relationships in general (Aulakh et al., 1996; Eriksson, 2006) and in construction in particular (Voordijk et al., 2000; Rahman and Kumaraswamy, 2002). By TCE, a competitive advantage results from the efficient governance of transactions (Williamson, 1985), which requires tailoring of procurement procedures to transaction characteristics (Eriksson, 2006). Looking specifically into the construction industry, the terms FP and cost plus (C+) contract have been applied by economists. According to Bajari and Tadelis (2001), in the FP contract, “the buyer offers the seller a pre-specific price for completing the project, while a C+ contract does not specify a price, but rather reimburses the contractor for cost plus a stipulated fee” (p 238). However, in the building industry, Ferry (1972) and Turner (1990) have divided construction contracts into two types, namely cost reimbursement (CR) and price-in-advance (PA).

Numerous forms of alternative contractual arrangements are adopted in the industry but C+ and FP contracts are most commonly used (Bajari and Tadelis, 2001; Business Roundtable, 1987; Bartholomew, 1998; Clough and Sears, 1994; Hinze, 1993; and Sweet, 1994). However, FP and CR are also claimed to be the most widely used forms of contract (Von Branconi and Loch, 2004).

In terms of research practicality, Bajari and Tadelis (2001) argue that FP contracts are evaluated through competitive bidding while C+ contracts involve negotiation. However, both contracts have their own disadvantages. For example, a C+ contract has problems in implementing incentives in case of changes, and in determining fair and equitable cost targets. Even if FP contracts are assumed to have sufficiently clear and accurate drawing, bidding documents, general condition of contract, and specifications for the construction, in many cases, these contracts tend to have changes. Both types of contract will incur problems, conflicts, and disputes among parties.

Changes in orders or directions during the construction stage will provide a contractor an advantage of having a bargaining power to negotiate compensation charges. FP contracts require a buyer to invest more in design and specification, whereas design and construction can be done simultaneously for C+ contracts.

Comparing the above concepts, CR appears to be similar to C+, whereas PA can also be recognized as FP. Based on the work by Ferry, FP is the most commonly used procurement contract, but there remains a need to use C+ contracts. These contracts are widely used in the industry (Bajari and Tadelis, 2001), with the dominance of FP contracts especially for public projects. However, Bajari and Tadelis (2001) argue that many private-sector transactions are also governed by procurement contracts.
Numerous studies have been conducted on the public sector, the practices of which are mostly followed by the practices of the private sector. According to McAfee and McMillan (1986), governments use FP contracts most commonly, with C+ contracts sometimes used and incentive contracts increasingly being employed.

5.1 Fixed Price (FP)/ Price-in-Advance (PA) Contract

In a “price-in-advance” contract, a contractor agrees to fulfill his obligations for a sum of money agreed in advance. An example of a PA contract is the lump sum contract based on bills of quantities, which includes bills of approximate quantities, negotiated tender and serial contracting, schedule of prices, and package deal. FP contracts in the private sector tend to be awarded through competitive bidding. In this contract, the general contractor would not be willing to perform duties beyond those to which he is contractually bound without additional compensation. Two contractual procedures used to adjust compensation in FP contracts are the change orders and change directives (Bajari and Tadelis, 2001).

Normally, when a person is looking for things, a client is seeking bidders for his house renovation, or a public or private agency needs to procure goods and services, they try to find the lowest tender and use their bargaining power. Manelli and Vincent (1995) argue that even if the benefit of the selection of the lowest tender has been generally agreed upon by economists due to competition, on the other side, especially in the case of uninsured services, quality – which is guided by inefficient and incomplete contracts – makes an opportunity for profit maximization for the other party. If the quality of the good sold is doubtful, price competition may ensure that only the poorest types of goods are provided.

Furthermore, McAfee and McMillan (1986) argued that in such a type of contract, a client normally calls for bids from interested firms and selects the lowest bidder. The client cannot directly observe the expected production costs of any bidder and, therefore, cannot know which one is the efficient firm. Each bidder must determine his bid without knowing the expected costs of his rivals. The selected bidder would then be better informed than the government about the vagaries of the particular project; thus, the government is unable to observe how much effort the firm is making to limit production costs. The government must design a contract to address both adverse selection (the government does not know the expected cost of any firm) and moral hazard (the government cannot observe the selected firm’s efforts to keep its realized production costs low). In more complicated matters, if the firms are risk-averse, it is in the government’s interest to offer a contract in which it bears some of the risk of unpredictable cost fluctuations. The contract used in practice by governments makes the payment to the contractor a linear function of its bid and/or realized costs. With an FP contract, the payment is simply the firm’s bid. Fernández (1996) mentions that the contest mechanism is used when other features from the bids need consideration along with the price. However, he argues that bidding firms have different levels of observable quality. Competitive bidding is perceived to select the lowest cost bidder, preventing corruption and favoritism that are opposed to efficiency.

Uncertainty leads to design changes occurring after the contract has been signed and after the production has begun. Bajari et al., (2006) argue that the FP/PA contract should be applied for a high-level design completeness. For a competitive bidding, a contractor has the incentive to hide information about possible design flaws, submit a low bid, and recoup profits once changes are required. In a PA contract, because the client has agreed to the terms and contract in advance, the client/representative has no control on the cost, detailed method, programming, and expenditure. However, the contractor will be involved in high risk, such as inflation, because he has to construct the building with
the price agreed in advance (Turner, 1990). The PA is widely adopted in the global construction industry, which includes the traditional and alternative systems such as design-and-build as well as turnkey.

FP payment shifts the risk of cost overruns to the main contractor during the actual construction. Floricel and Miller (2001) have investigated 60 large-scale engineering projects in an attempt to develop a strategic framework for handling project uncertainty. The results show that FP contracts do not underpin possibilities for joint performance improvement because the contractor keeps all the savings or losses. When a CR form of payment is used, the contractor is compensated for the actual cost during project execution. Thus, the client takes the risk of cost fluctuations (Floricel and Miller, 2001).

5.2 Cost plus (C+)/ Cost Reimbursement (CR) contract

In CR, the contractor agrees that all his expenditure on labour and materials, among others, will be met by the client, on top of which he will charge a fee on an agreed basis (Ferry 1972). The CR will be used when the contract sum is arrived at on the basis of actual costs of labour, plants, and materials used in the work, plus an agreed allowance for overheads and profit (Turner 1990). Examples of CR contracts are C+ percentage, C+ fixed fee, direct labour, management contract, and target cost. By definition, CR contracts without fees are seldom accepted by commercially-minded contractors. Situations wherein the contractor acquires the know-how or improves his image may be examples where such contracts may become real. In extensive use are contracts with a specified fixed fee.

CR contracts mean that the client agrees to reimburse the contractor in full. As a consequence, the contractor has no immediate incentive to keep the costs and, therefore, to keep the price low. The only incentive is to avoid a loss of goodwill in case the client and the contractor would again work together in the future and when competition exists among potential contractors. Depending on how the fee is defined, one can discriminate four types of CR contracts, namely cost reimbursement (CR) contracts without fees; cost plus (C+) fixed-fee contracts; cost plus (C+) percentage contracts; and time and material contracts.

Oyegoke et al. (2009) and Gould (1997) report that the CR contract is sometimes referred to as C+ or prime cost contract. In CR contracts, the employer pays the contractor the actual cost of work plus a management fee, which includes the contractor’s overhead charges, supervision costs, and profit. In a C+ contract, negotiations may include a procedure for pre-qualifying and selecting subcontractors after key trade contractors have been identified.

The owner may set guidelines for hiring subcontractors, including minority participation and use of local entities. Most often, the general contractor is given a degree of latitude in selection, with the principal criteria being reasonable costs, timely completion, and good quality. Nevertheless, the owner has the right to approve subcontractors, whereas the general contractor remains responsible for the performance of all subcontractors (Robert 1997). Under this arrangement, the client pays the contractor the prime cost (i.e., actual cost of labour, plants, and materials used during construction). In addition to the prime cost, the contractor is paid an agreed sum to cover profit and establishment charges. Such contractual arrangements may be adopted for projects where the client may wish to influence the execution of works and, hence, my assume the entire risk of site operations; an early project start is required, but the extent of works cannot be accurately predicted; and a high standard of work is required such as those related to an emergency, repair, or those experimental in nature (Kwakye 1997).
With a C+ contract, the government agrees to completely cover the costs incurred by the contractor, plus pay a fee that is either fixed in advance or is a proportion of costs (McAfee and McMillan 1986). An incentive contract makes the payment dependent on both the bid and realized costs: if the realized costs exceed the firm’s bid, the firm is responsible for some fraction of the cost overrun; if the firm succeeds in holding its costs below its bid, it is rewarded by being allowed to keep a part of the cost savings. This article solves the linear contract that is optimal for the government. The optimal linear contract is determined by a trade-off between stimulating competition in the initial project bidding and sharing risk between the contractor and the government on the one hand, and providing the contractor incentives to limit the production costs on the other hand.

Von Branconi and Loch (2004) have reported their experience with construction contracts in a major engineering company and have argued that, in the case of CR forms of payment, the contractor has very little incentive to find more efficient solutions or to cooperate with the client. Both FP and CR contracts have adverse effects on communication between the client and the contractor (Turner, 2005).

Numerous arguments on the use of these procurement contracts, such as those of McAfee and McMillan (1986), suggest that FP contracts should be used much less frequently than their current usage and that C+ contracts should not be used in projects with more than one bidder. The lump-sum contract is the most popular FP contract, where the total project cost is estimated at the bidding stage (Hinze, 1993).

6.0 Procurement system and contract in Malaysia

Inheriting from the British procurement system (Jaafar and Aziz 2009; CIDB 2009), Malaysia practices the traditional procurement system, which is mainly applied by the public and private sectors to develop projects. Beginning in the 1990s, Malaysia has adopted a new procurement system to cope with the increasing number of project implementation and the complexity of building requirements and mega infrastructural projects to support the country’s growth (Rashid et al. 2006). The introduction of different “fast-tracking” project procurement systems is an effort by the industry to offer better deals to clients or customers, as they start realizing the “value for money” for their projects in terms of cost, time, and quality (Rashid et al., 2006). In general, three types of procurement systems are practised within the Malaysian construction industry: traditional, design and build, and management (Hashim et al., 2006; Rashid et al., 2006; Seng, 2006; Ismailet al., 2006; Adnan et al., 2008).

However, the scenario in the Malaysian construction industry is now different. Government’s policy seems to change the practice of procurement system used in the industry. The likelihood of serious instability in Malaysia has led the government to introduce a set of economic policies designed to promote further economic growth while at the same time ensuring redistribution, which is designed to uplift the native Malays. One of the important elements in this strategy is the use of procurement contracts structured in such a way so as to generate entrepreneurial middle-class Malays over time. In 1997, the World Trade Organization (WTO) Trade Policy Review’s report on Malaysia considered the system of preferences. At that time, for supplies contracts, Malaysian Bumiputera companies received a margin of preference of 2.5–10% over a reference price. The margin of preference was inversely proportional to a value of not more than MYR15 million. Malaysian Bumiputera manufacturing companies also enjoyed preferential treatment of 3–10%, with the margin of preference being inversely related to contract value of up to MYR100 million. All supplies contracts with a value of between MYR10,000 and MYR100,000 as well as works contracts of up to MYR100,000 were reserved for Bumiputera.
suppliers. In planning for procurement of works contracts, at least 30% of the annual contract value was set aside for Bumiputera contractors. Contracts above these limits were open to competitive bidding (WTO 1997).

7.0 Conclusion

The discussion so far leads to a conclusion that the terms covered by procurement system and procurement contract have been used interchangeably in the literature as well as in the industry. However, the term “procurement system” is more widely used in Malaysia. Procurement system has wide definitions, whereas procurement contract is more related to transactional economics that includes the agreement between parties and payment. From the literature, we can conclude that the use of FP procurement contract, which consists of conventional and modern ones such as design and build, is more common. In comparison, the CR contract, which covers management procurement system, is less practiced in Malaysia. Both practices have their advantages and disadvantages.

Findings from the Malaysian construction industry show that there is very limited knowledge on the procurement contract among industry players. This can be attributed to problems associated with the higher educational system in Malaysia. In construction-related courses, the educational system does not teach students about procurement systems or contracts except in quantity surveying courses. This is something to be pondered upon, especially when it comes to traditional procurement wherein architects are normally given a task to be a project team leader, and yet they know very little about procurement. In addition to the new trend of procurement system nowadays, which is heavily moving into the modern system, different roles can be played by each consultant, thereby emphasizing the need for each industry player to have knowledge on procurement systems.

In the past, scholars have acknowledged the important contribution of procurement systems to construction performance. Moreover, they also have identified financial aspect as a major factor of construction or project failure in the construction industry. Financial issue is closely related to the selection of procurement contract. Thus, aside from the emphasis on the understanding of “procurement system”, people involved in the industry should have deep knowledge on “procurement contract” as well. This implies better practices that will help improve the performance of the industry.

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