



# Cost overrun in the Malaysian construction industry projects: A deeper insight

Zayyana Shehu <sup>a,\*</sup>, Intan Rohani Endut <sup>c</sup>, Akintola Akintoye <sup>b</sup>, Gary D. Holt <sup>b,d</sup>

<sup>a</sup> *3 Lines Technologies UK LTD, 165-168 Regent Street, London W1B 5TD, United Kingdom*

<sup>b</sup> *Professor of Construction Management and Economics, Grenfell-Baines School of Architecture, Construction and Environment, University of Central Lancashire, Preston, PR1 2HE, United Kingdom*

<sup>c</sup> *Faculty of Civil Engineering, University Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia*

<sup>d</sup> *Professor of Innovation in Machinery Management, Birmingham City Business School, Birmingham, B42 2SU, United Kingdom*

Received 20 April 2013; received in revised form 2 April 2014; accepted 8 April 2014

Available online 13 May 2014

## Abstract

The construction industry drives economic growth and development in Malaysia, but unfortunately, its projects often suffer from cost overruns (that is, negative cost variance such that final project cost exceeds contract sum). This can lead to conflict and litigation, or in the extreme, projects may even be abandoned. To better understand this phenomenon, a questionnaire survey of Malaysian quantity-surveying consultants was undertaken to obtain project characteristics and cost performance data, in relation to a sample of 359 recently completed construction projects. Data were analysed in terms of project financial outturn based on: contract values; project sector; type of project; procurement route; nature of projects; and tendering method used. The findings offer stakeholders descriptive statistical cost performance information in relation to these characteristics. These statistics will support first-order project management decision-making within Malaysia particularly; and internationally more generally, with a view to helping minimise project cost variance in the future.

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*Keywords:* Malaysia; Construction industry; Project management; Cost variance; Project cost data

## 1. Introduction

Cost overruns frequent the construction industries of many (both developed and developing) countries (Enshassi et al., 2009; Sweis et al., 2013) and the significance of this, has attracted much research over recent decades (Arditi et al., 1985; Creedy, 2004; Dawood, 1998; Dlakwa and Culpin, 1990; Doloi, 2013; Frimpong et al., 2003; Kaming et al., 1997; Koushki et al., 2005; Mansfield et al., 1994). This is because cost is arguably one of the most fundamental criteria for measuring the success of any project (Becker et al., 2014; Hajarat and Smith, 1993; Memon et al., 2013; San Cristóbal, 2009). Although, cost still retains intrinsic relationships with other performance criteria such as

time, quality and value-for-money (Holt, 2010). Nonetheless, despite its academic attention, negative construction project cost variance (the difference between contract sum and a greater final project cost) remains. This is especially a problem for Malaysia's construction industry and, its broader developing economy (Ramanathan et al., 2012).

Project costs are commonly categorised as either direct or indirect for contracting, accounting, taxation and other purposes (Becker et al., 2014). However, according to Holland and Hobson (1999) there is no universally-accepted categorization framework for the construction industry, to partition construction costs into direct and indirect groupings. Therefore, this research considers the both of these cost classifications, to study Malaysian construction project cost overruns.

The difference between agreed contract sum and final project cost can be expressed as a ratio (Kaka and Price, 1991) whereby a

\* Corresponding author. Tel.: +447729355179.

E-mail address: [zayyana.shehu@gmail.com](mailto:zayyana.shehu@gmail.com) (Z. Shehu).

ratio >1.0 represents cost overrun. According to Cleveland (1995), an accurate project cost estimate can provide a good basis for project control during construction; while inaccurate cost estimation is detrimental to both contractors and clients. This because an overestimated cost will likely be unacceptable to the client at project feasibility stage, whereas an underestimated cost will typically lead to an increased outturn cost (ratio >1.0). The latter situation typically translates to financial losses for the contractor and/or client (depending on who assumes the burden according to contract terms) (Akintoye, 2000; DeMarco, 2005). Given this, the aim of this study was to investigate certain project characteristics influencing Malaysian construction project overruns, through an industry-wide survey and subsequent analysis, of real project outturn data.

## 2. Cost overruns and their imperative in Malaysian construction projects

Construction cost overrun has attracted attention at both national and global levels. Using the factor analysis technique, Le-Hoai et al. (2009) compared causes of construction time and cost overruns in Asia and Africa, to categorize them into seven principal factors: slowness and lack of constraint; incompetence; design; market and estimate; financial capability; government; and workers. Nawaz et al.'s (2013) work on cost performance in Pakistan listed factors that are responsible for cost overruns, to include corruption and bribery, political interests, poor site management, delay in site mobilization, rigid attitude by consultants, extra work without approvals, and frequent changes during execution. Rosenfeld (2014) meanwhile undertook a root-cause analysis of construction-cost overruns and identified 15 universal root causes, among which, premature tender documents; too many changes in owners' requirements or definitions; and unrealistic tender-prices were featured.

Different strategies are continually being developed to address construction cost overrun. For example, the UK Government Construction Strategy report by the Procurement/Lean Client Task Group (UK Government, 2012) proposed an Integrated Project Insurance; to cover excessive cost overrun as a means of providing cost effective financial security to any funder and cover all for all supply chain members. The rationale underpinning this is to remove the potential for a 'blame culture' and the 'passing-on' of liability within the construction team. The US Construction Industry Institute (CII) have conducted extensive research into indirect construction costs (IDCC) based on expert opinions, data collection interviews and analysis of 47 case study project surveys. CII published a comprehensive guide on process improvement opportunities to reduce IDCC (CII, 2014a). They also offer a performance assessment system, through which online users can submit project data to assess (inter-alia) cost performance, against best practice statistics (CII, 2014b).

The construction industry in Malaysia plays a vital role in the country's development (Azhar et al., 2008; Endut, 2008; Memon et al., 2013). It contributes significantly to national economic growth (Sambasivan and Soon, 2007); creates employment both directly and indirectly (Ramanathan et al., 2012); and improves citizens' quality of life through provision of essential socio-

economic infrastructure and public facilities (Memon et al., 2013). According to Mansor (2010), cited by Memon et al. (2013), the 10th Malaysia Plan allows RM230 billion ( $\approx 72.4$  billion USD at 2014 conversion) for 'development', and RM20 billion ( $\approx 6.3$  billion USD) facilitation funds to create impetus in driving demand for the sector.

Of the RM230 billion development expenditure, 60%, or RM138 billion ( $\approx 43.4$ USD), was expended on physical development to be undertaken directly by the construction sector. With such high levels of capital investment and considering said role construction plays in Malaysian economics, the industry faces two recurrent (and inter-related) problems. These are: i) slippage of project-schedules ('time overrun'); and ii) negative cost variance ('project cost overrun') (Endut et al., 2006; Ramanathan et al., 2012; Sambasivan and Soon, 2007). A result of these (and other problems linked to them) is that many clients are left with a feeling of dissatisfaction, relating to their construction project experience (Egan, 1998; Nzekwe-Excel, 2012).

This research adopts the axiom for evaluating the project cost ratio (CR) proffered by Endut (2008) viz: Cost Ratio (CR) = (Final Cost/Contract Cost). As explained in the Introduction, the ideal CR is 1.0; so any value above this can be considered as cost overrun. Table 1 shows the cost ratios of public, private, new build and refurbishment projects derived from the sample data used in this study. It can be seen that the CR values for all categories of Malaysian projects exceeded 1.0.

The problem of construction projects exceeding contract sum exists among both developed and developing countries (Anastasopoulos et al., 2010; Sambasivan and Soon, 2007). As can be seen from the cost ratio analyses in Table 1, the overall CR = 1.04. But, it has been claimed that the extent of overrun, may be greater among developing economies (Memon et al., 2011). For instance, Kaming et al. (1997) indicated that more than 92% of Indonesian building projects experienced cost overruns, whilst Kolltveit and Gronhaug (2004) revealed overruns from between 6 and 160% among Norwegian projects. Meanwhile, Ganuza-Fernandez (1996) (cited by Perez-Castrillo and Riedinger, 2004), suggested that as much as 77% of Spanish construction projects suffered in this way and one-third of these extended approximately 20% beyond contract sum. It is clear therefore, that this is a global phenomenon (see additionally, for instance, Ali and Kamaruzzaman, 2010; Doloi et al., 2012; Enshassi et al., 2009; and Memon et al., 2013). Approximately half of all Malaysian construction projects experience between 0.03 and 72.88% cost overruns and so is little different to other countries in this respect (Memon et al., 2013).

Scholars including Morris and Hough (1987), Ellis (1985) and Flyvbjerg et al. (2004) suggest that larger projects experience

Table 1  
Project type cost ratios.

Category	Cost ratio	Mean	Min	Max	Median	SD
Overall	1.04	1.02	0.20	1.89	1.01	0.16
Public project	1.04	1.01	0.20	1.89	1.00	0.16
Private project	1.05	1.06	0.91	1.73	1.03	0.14
New build	1.05	1.01	0.20	1.89	1.00	0.16
Refurbishment	1.01	1.03	0.59	1.48	1.01	0.16

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