A Review of the Performance of the Malaysian Construction Industry

Toong Khuan Chan[1], May Chuan Theong[2]

Abstract

The Malaysian construction industry developed the Construction Industry Master Plan 2006-2015 to achieve world class status by 2015. Industry stakeholders identified seven strategic thrusts together with twenty one strategic recommendations, eighty two action plans and 453 activities to achieve this vision. Six years have elapsed since the launch of the master plan in 2006 and it is now prudent for the stakeholders to review the outcome of all its strategic thrusts and activities towards achieving the goals set earlier. A set of performance measures were developed previously resulting in a list of some 34 unique indicators. Tentative targets were set by benchmarking the performance of the local industry to other national initiatives and modified to suit local conditions. The objectives of this study are to determine the performance measures for the 2011, to compare the performance with the 2005 base year and to assess the achievements made in the last six years. Results of this study indicate that although construction demand has increased substantially, worker productivity remained sluggish, safety performance did not improve, export of construction services declined as many companies reduced their presence overseas. The only encouraging observation was a marked increase in construction quality. These results indicate that a thorough reassessment of the construction industry master plan in now necessary to ensure that the strategic actions produce the required outcomes.

Keywords: Benchmarking, Performance evaluation, Malaysia

1. Introduction

The Malaysian construction industry has largely been supported by substantial public spending to fund the construction of basic infrastructure in order to enhance economic activities and to provide affordable public housing. Due to a decline in public spending in 2003 and 2004, the construction sector value added dropped 0.9%, 1.8% and 0.5% in 2004, 2005 and 2006, respectively. Towards the end of 2007, the Malaysian Construction Industry Development Board (CIDB) published a ten-year master plan (CIDB, 2007) that will be implemented from 2006 to 2015 with the objective of refocusing the strategic position and charting the future direction of the industry. The main driver for the strategic plan was the

[1] Senior Lecturer; Faculty of Architecture Building and Planning; The University of Melbourne; Melbourne, Australia; tchan@unimelb.edu.au
[2] Lecturer; School of Architecture, Building and Design; Taylor's University; Subang Jaya, Malaysia; maychuan.theong@taylors.edu.my

fact that the industry has recorded an average annual growth of only 0.7% during the period between 2000 and 2007 compared to an average annual gross domestic product growth of 5.5% over the same period. There were concerns that the construction industry, being a main pillar of industrialisation and major contributor to economic growth, was not performing at its best and thus not able to meet the dual challenge of open markets and greater global competition. The master plan was therefore initiated to establish an innovative, sustainable, professional, profitable and world-class construction industry.

The objectives of this study are to determine the performance measures for 2011, to compare the performance with the 2006 base year and to assess the achievements made in the last six years. A list of 34 performance measures were previously suggested for the master plan by examining similar national initiatives in Canada, Chile, Denmark, New Zealand and the UK (Chan, 2009).

Previous studies (Landin and Nilsson, 2001; Kagioglou et al., 2001; Mohamed, 2003; Takim et al., 2003; Beatham et al., 2004; Bassioni et al., 2004; Lin and Shen, 2007; Nudurupati et al., 2007; Yu et al., 2007) have mainly been focused on evaluating project outcomes or company performance and implemented primarily for the construction companies, consultants and managers of construction projects. Other stakeholders, such as clients, suppliers, regulatory authorities and the community were not assessed or taken into account.

2. Performance Measurement Framework

Many performance measurement frameworks have been suggested and adopted for the purpose of improving performance over the last decade. Good overviews of performance measurement frameworks in construction together with discussions and critiques of the deficiencies can be found in Kagioglou et al. (2001), Bassioni et al. (2004) and Costa et al. (2006). These frameworks include performance measures which can be implemented at the project, company or industry level where the measures for the project perspectives are sub-sets of the measures for the company performance, and the aggregation of company measures evolve into measures for the industry. Kagioglou et al. (2001) extended the framework for an organisation to the construction industry by adding the ‘project’ and ‘supplier’ perspectives. Bassioni et al. (2004) reviewed the three main performance measurement frameworks in the UK construction industry – the key performance indicators (KPI), Balanced Scorecard, and the EFQM Excellence Model, and highlighted a range of issues that requires further research. These include how existing performance measurement systems interact with newly developed systems, the setting of targets and standards for performance measures, aggregation of measures, hurdles to implementation, and using performance measures to take managerial action. Some of these concerns were addressed by Costa et al. (2006) which highlighted the role of performance measurement to enable a company to benchmark its performance against that of other similar organisations in key business activities. Five performance measurement initiatives, some implemented with the intent of establishing a benchmarking programme, were discussed in a previous publication (Chan, 2009)

The review above has given a broad overview of the various performance measurement and benchmarking initiatives at various stages of implementation, beginning with the UK which has a mature system of reporting KPIs since 1998, the Chilean initiative, and more recently the Danish (BEC, 2006), New Zealand (NZCAE, 2007) and Canadian efforts (Rankin et.al.,2008) have made significant progress although initiated only in the mid-2000s. These programmes have indicated that the performance measures for the construction industry necessarily include a combination of metrics for projects (time and cost target, quality), companies (profitability, turnover, return on capital) and the industry (safety, growth, labour productivity, innovation, training, construction demand).

3. Methodology

The list of performance measures was designed to focus on the seven strategic thrusts described in the master plan. A number of measures were adopted from other initiatives, mainly from the UK, Danish and Singapore performance measures. Other measures were created to reflect the specific foci of the industry: e.g. percentage of contracts awarded to local construction companies, number of companies with quality assurance programmes, number of construction patents and spending on information and communications technologies. Ideally, this mid-term review should encompass the entire set of performance measure but as the industry has not collected sufficient data to produce a comprehensive account of its performance, this study will be limited to publicly available data and information. The performance measures examined in this review is therefore limited to (a) annual construction demand, (b) percentage of projects awarded to local contractors, (c) export of construction services, (d) worker productivity (measured as value-added per worker), (e) building quality, (f) occupational safety and health, and (g) investments in IT. Data on project values, exports, quality and safety was obtained from the CIDB, while worker productivity and investments in IT were obtained from the Department of Statistics.

4. Comparing the Performance of the Industry in 2005 and 2011

Annual construction demand from both the public and private sectors are important measures of the financial viability and sustainability of the construction industry. The total value of construction projects awarded in 2006 consists of RM 22.5 billion from the public sector and RM 38.5 billion from the private sector, leading to a total of RM 61.0 billion. A marked increase was observed in 2007 (see Figure 1) when the government announced significant investments for infrastructure to boost construction demand. The government through its five-year economic development plan for 2006-2010 and Economic Transformation Programme (ETP) has increased total construction demand to RM 93.3 billion in 2007, an increase of more than 50%. Construction demand remained high in 2008 to 2011 with private sector spending contributing an ever increasing share of the total demand due to the government's efforts to enhance development projects under the Public-Private Partnership Programme (PPP). In 2011, the public sector share of construction demand has dropped to a mere 23% (DOSM, 2012).

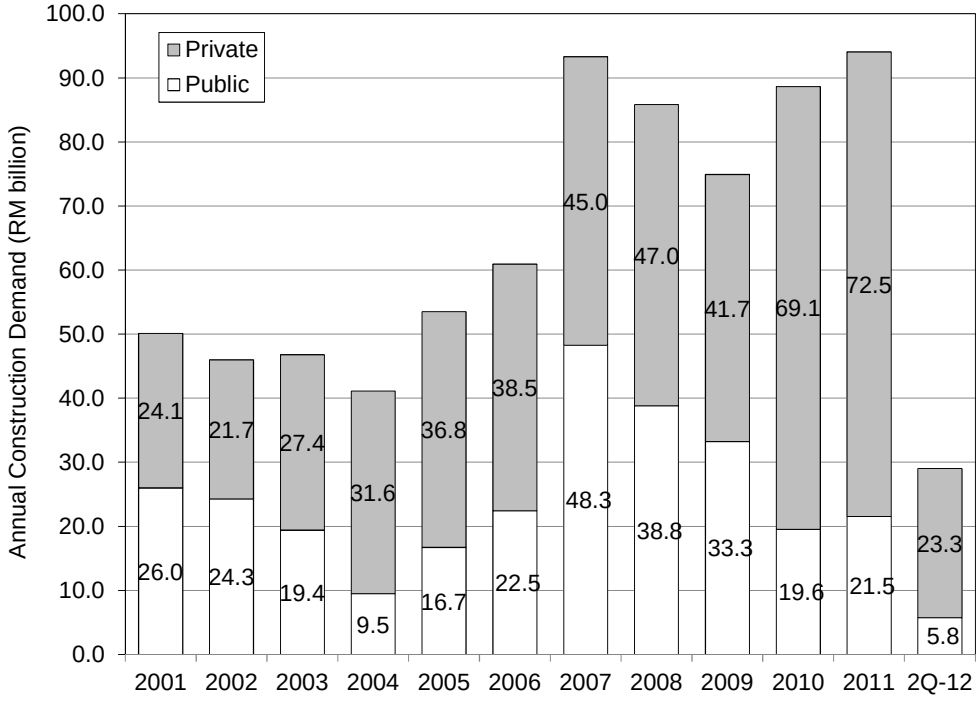

Figure 1 Construction Demand reported as value of projects awarded (Source CIDB Quarterly Information Bulletins)

The ratio of value of contracts awarded to Malaysian contractors compared to foreign contractors has consistently exceeded 80% since 2000 as shown in Figure 2 and is expected to remain above 80% indicating that local contractors were able to effectively compete against foreign contractors operating in Malaysia. One perturbing observation was the sudden increase in the proportion of work won by foreign contractors to 18.5% in 2011.

The total value of overseas construction activities directly measures the export potential of the construction industry and its efforts to penetrate markets overseas. It was reported that Malaysian construction companies won a total of RM 18.5 billion worth of contracts overseas in 2007 and another RM 19.5 billion in 2008 (see Figure 3). These figures seem to indicate that the industry is well on its way to realise its target of RM 45 billion in overseas project value by 2015. However, the global financial crisis which hit many of the countries in the Middle East and South Asia severely affected this overseas expansion. The overseas projects won by Malaysian companies only totalled RM 4.0 billion in 2011.

The construction sector in Malaysia has long been perceived as a low productivity sector due to the employment of a large number of migrant workers and the lack of investment in technology and equipment. A major strategic thrust of the CIMP was to encourage the use of Industralised Building Systems (IBS) reduce the industry's reliance on migrant workers and to improve quality and productivity. Productivity (value-added per worker) is obtained by dividing the total construction sector value-added by the total number of workers in the sector. Based on the data for value-added shown in Figure 4, the value-added for the construction industry when reported in constant 2000 prices was observed to increase at an annualised rate of 5.6% from 2006 to 2010. However, when this figure is divided by the number of workers in the industry the value-added per worker for 2005 was RM 26,615 whereas the figure for 2010 dropped drastically to RM 18,697. This significant drop in

productivity was due to a large increase in the number of workers from 602,694 in 2009 to 974,488 in 2010.

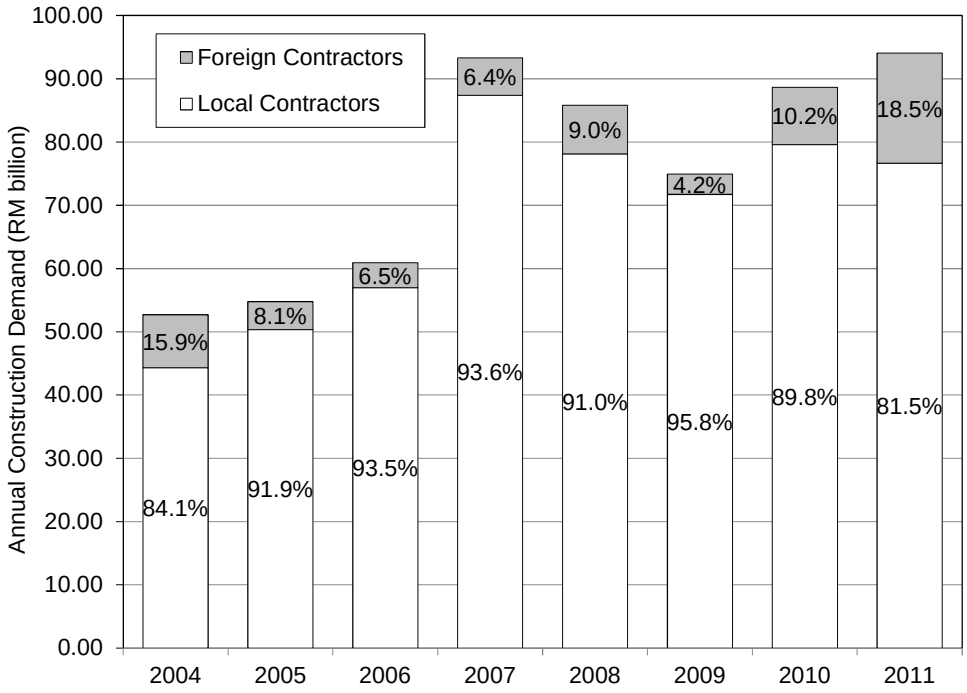

Figure 2 Percentage of project value awarded to local and foreign contractors (Source CIDB Annual Reports)

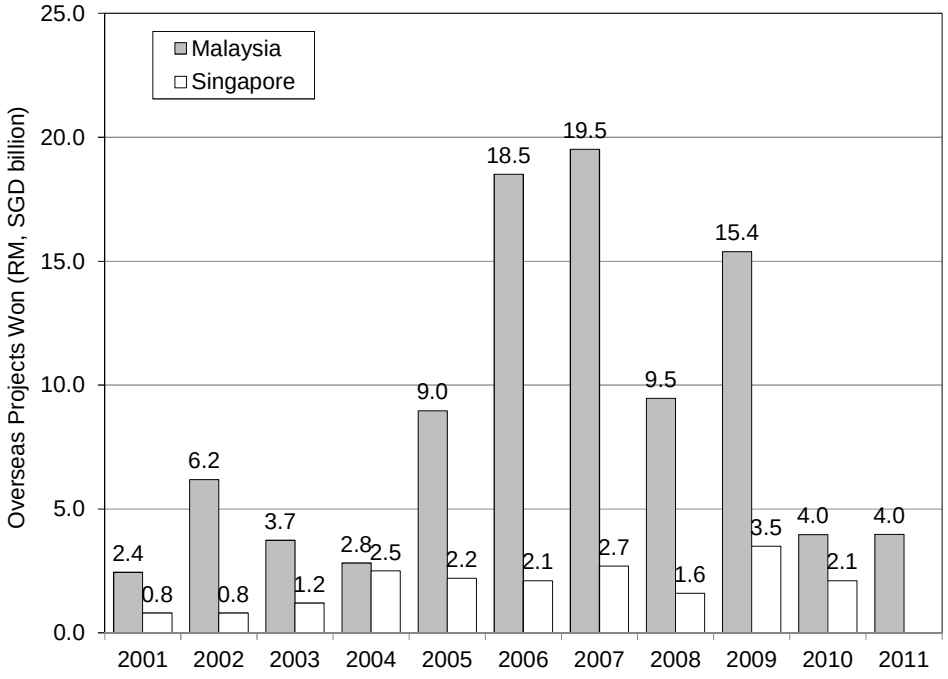

Figure 3 Export of Construction Services reported as value of projects won overseas (Source CIDB Quarterly Information Bulletins, BCA Annual Reports)

In 2001, the CIDB introduced the QuaLity Assessment SyStem In Construction (QLASSIC) to evaluate the quality of a completed building and covers workmanship in three components; structural, architectural and external works. Existing projects which have been assessed in accordance with QLASSIC have achieved a median score of 60-65 in 2006 and improved to a median of 70-75 in 2011. The number of projects evaluated remained low at 73 projects in 2006 and only 120 projects in 2011 which may not be representative of the quality of the output of the entire construction industry. The distribution of QLASSIC scores is shown in Figure 5 below.

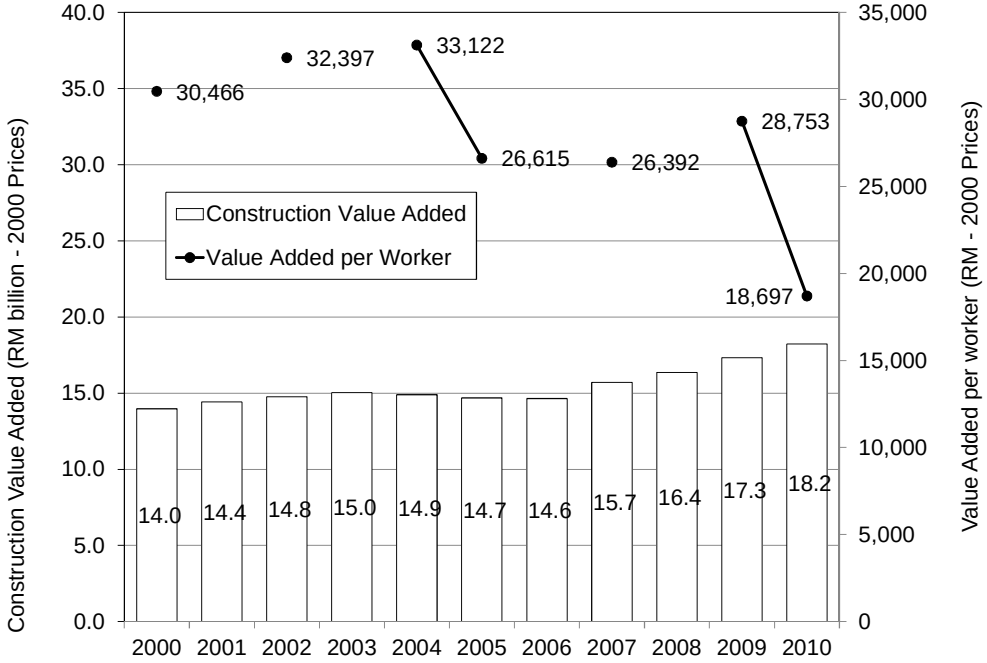

Figure 4 Value-added per worker of the Construction Sector in Constant 2000 Prices (Source DOSM, 2005, 2012a, 2012b)

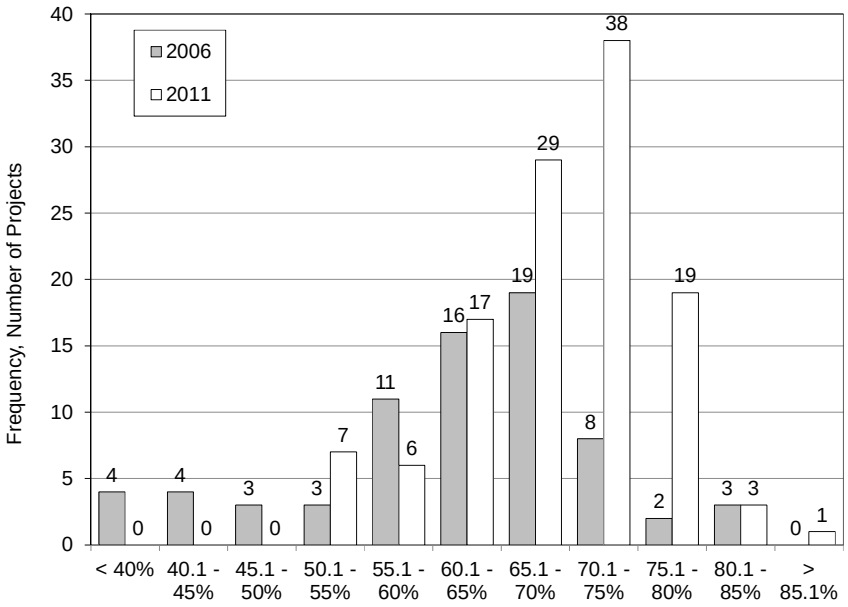

Figure 5 Distribution of QLASSIC score between 2006 and 2011 (Source CIDB Annual Reports)

Industry stakeholders have insisted on major improvements in occupational safety and health performance. Data on benefits claimed from the Takaful Insurance Scheme organised by the CIDB and the Social Security Organisation (SOCSO) can be classified into fatal accidents, accidents resulting in permanent disability and hospitalisation. The Department of Occupational Safety and Health (DOSH, 2008, 2009, 2010) also investigates accidents at construction sites and provides the accident data shown in Table 1. The data from these three sources, although vastly different because of distinct member profiles, does not seem to indicate any improvement in safety performance at the worksite.

Table 1: Summary of Accident statistics from CIDB, SOCSO and DOSH

Consequence of Accident	CIDB Takaful		SOCSO		DOSH	
	2005	2011	2005	2010	2005	2011
Fatality	23	25	76	88	63	51
Permanent Disability	75	61	618	815	7	5
Hospitalisation	69	108	3948	4813	66	43
Total	167	194	4642	5716	136	99

In order to leverage on information technology to improve the design process and to increase the efficiency of the building approval process, measures such as total IT spending by construction companies on computer hardware and software may be tracked; data for which is compiled during the census or surveys of construction industries. Data for 2005 and 2010 (DOSM, 2006, 2012b) shows that capital spending and net book values for computer hardware and software approximately doubled in this period.

Table 2: Detailed capital expenditure and fixed assets for construction companies

Type of fixed assets	Net Book Value: 1-Jan	Capital Expenditure	Net book value: 31-Dec
2005 Total Assets	7,598,075	1,294,220	7,486,517
2005 Computers:			
Computer hardware	(1.0%) 73,130	(1.3%) 16,356	(0.9%) 63,876
Computer software	(0.4%) 27,868	(0.3%) 3,906	(0.3%) 19,252
2010 Total Assets	14,368,220	2,197,803	14,476,140
2010 Computers:			
Computer hardware	(2.2%) 310,919	(0.8%) 18,097	(1.9%) 268,454
Computer software	(0.5%) 76,078	(0.1%) 3,202	(0.5%) 67,930

5. Discussion

The surge in domestic construction demand from RM 60.7 billion in 2007 to RM 91.3 billion in 2011 resulted in only a minimal increase in the percentage share of contribution to the gross domestic product from 2.9% to 3.0%. A consequential increase in gross output for the construction industry was only observed in 2010 indicating that there is generally a 2 or 3 year delay for the increase in demand to be converted to an increase in output. Even though the construction value added increased from RM 16.1 billion to RM 21.4 billion in constant 2005 prices, the national economy increased from RM544 billion to RM 709 billion. As such the contribution from construction remained small.

It is worthwhile to note that this large increase in demand was met largely by local contractors, with foreign contractors picking up less than 10% each year until the sudden spike to 18.5% in 2011. The value of the projects won by foreign contractors amounted to RM 17.4 billion in 2011. There is currently no information from the industry whether the award of these projects to foreign contractors is due to the technical complexity or if the demand has exceeded the capacity of the local contractors.

Malaysian contractors were very successful in winning projects from overseas in 2007 and 2008 but these activities have been curtailed substantially with overseas projects at RM 4.0 billion each in 2010 and 2011. The major thrust for local contractors to venture overseas was the lack of opportunities within the local market in the 2004 to 2006 period. The government was also very aggressive in exporting construction services to India and South-East Asia with a number of government-to-government projects initiated during that period. Once the effects of the 2008 global financial crisis were felt in the Middle-East, construction demand slumped and many successful contractors returned to focus on the local market. In contrast, the Singapore contractors have remained mainly in their local market as the government attempts to smooth out the spikes and troughs of the construction market by bringing forward or delaying large scale infrastructure projects. The export of construction services by Singaporean contractors has risen gradually in recent years as shown in Figure 3.

The large increase in construction demand was met with a surge in the number of construction workers in 2010. It is now clear from the data that the increase in output is not due to an increase in worker productivity but met by putting additional manpower resources to work. This increase in the number of workers, many of whom are migrant workers from Indonesia or Bangladesh now poses a serious concern to the government as a large proportion enter the country illegally or are poorly trained.

Quality has improved substantially since 2006 although the number of projects that are currently being assessed using the QLASSIC scoring system is still small. It is indeed encouraging to note that large increases in construction quality can be achieved in a short period of 5 years.

Safety in the construction industry remains a major concern to stakeholders. Data from three separate sources seem to indicate that the overall safety performance has not improved. It is possible that with the accident rate reported by CIDB and SOCSO increases due to a rise in

reporting to collect compensation benefit whereas the accident rate reported by DOSH decreased due to the punitive measures applied to the contractors when an accident occurs at their worksite.

Data on IT spending indicates large increases in the purchase of hardware and software by construction companies to support their operations. This bodes well for the increased utilisation of software tools for the design, quantification and planning of construction works.

6. Conclusion

All available data for 2011 was collated and analysed to determine the performance of the Malaysian construction industry. The performance of the industry in 2011 was compared with its previous performance in 2006. The findings indicate that although construction demand has increased significantly from approximately RM 60 billion in 2006 to RM 90 billion from 2007 onwards, this increased demand was delivered through the employment of more workers and resulted in lower overall worker productivity. Building quality has improved significantly but the industry's workplace safety performance remains unsatisfactory.

Malaysian contractors have also drawn back from their initially aggressive ventures overseas after the local construction market recovered from the lack of investments in the period from 2004 to 2006. Spending on both IT hardware and software has increased. Other aspects of industry performance could not be analysed due to a scarcity of data.

These findings indicate that a number of initiatives may have to be reviewed and revised to ensure that the outcomes envisioned in the construction industry master plan are achieved. The implementation plan will have to be substantially strengthened and intensified in the next phase as Malaysia experiences the full effects of trade liberalisation and global competitive pressures.

References

Bassioni, H.A., Price, A.D.F. and Hassan, T.M. (2004) Performance measurement in construction, *Journal of Management in Engineering*, ASCE, **20**(2): 42-50.

Beatham, S., Anumba, C., Thorpe, T. and Hedges, I. (2004) KPIs: A critical appraisal of their use in construction, *Benchmarking*, **11**(1): 93-117.

Building and Construction Authority (2008), *Annual Report 2007*, Singapore

Building and Construction Authority (2009), *Annual Report 2008*, Singapore

Building and Construction Authority (2010), *Annual Report 2009*, Singapore

Building and Construction Authority (2011), *Annual Report 2010*, Singapore

Building and Construction Authority (2012), *Annual Report 2011*, Singapore

Chan, T.K., 'Measuring performance of the Malaysian construction industry', *Construction Management and Economics*, **27**(12): 1231-1244, December 2009

Construction Industry Development Board (2007) *Construction Industry Master Plan Malaysia 2006-2015*, Kuala Lumpur.

Construction Industry Development Board (2007) *Annual Report 2006*, Kuala Lumpur.

Construction Industry Development Board (2008) *Annual Report 2007*, Kuala Lumpur.

Construction Industry Development Board (2009) *Annual Report 2008*, Kuala Lumpur.

Construction Industry Development Board (2010) *Annual Report 2009*, Kuala Lumpur.

Construction Industry Development Board (2011) *Annual Report 2010*, Kuala Lumpur.

Construction Industry Development Board (unpublished advance copy) *Annual Report 2011*, Kuala Lumpur.

Costas, D.B., Formoso, C.T., Kagioglou, M., Alarcon, L.F. and Caldas, C.H. (2006) Benchmarking initiatives in the construction industry: Lessons learned and improvement opportunities, *Journal of Management in Engineering*, ASCE, 22(4), 158-167.

Department of Occupational Safety and Health (2008) *Annual Report 2007*, Putrajaya.

Department of Occupational Safety and Health (2009) *Annual Report 2008*, Putrajaya.

Department of Occupational Safety and Health (2010) *Annual Report 2009*, Putrajaya.

Department of Statistics (2006) *Survey of construction industries 2005*, Malaysia, October 2006.

Department of Statistics (2012a) *National Accounts 2011*, Malaysia, 2012.

Department of Statistics (2012b) *Economic census 2011 – Construction*, Malaysia, June 2012.

Kagioglou, M., Cooper, R. and Aouad, G. (2001) Performance management in construction: a conceptual framework, *Construction Management and Economics*, **19**:85-95.

Landin, A. and Nilsson, C-H. (2001) Do quality systems really make a difference? *Building Research & Information*, **29**(1): 12-20.

Lin, G. and Shen, Q. (2007) Measuring the performance of value management studies in construction: Critical review, *Journal of Management in Engineering*, ASCE, **23**(1): 2-9.

Mohamed, S. (2003) Scorecard approach to benchmarking organizational safety culture in construction, *Journal of Construction Engineering and Management*, ASCE, **129**(1), 80-88.

New Zealand Centre for Advanced Engineering (2007) *The New Zealand Construction Industry National Key Performance Indicators – Handbook & Industry Measures 2006 Data*, Christchurch, New Zealand.

Nudurupati, S., Arshad, T. and Turner, T. (2007) Performance measurement in the construction industry: An action case investigating manufacturing methodologies, *Computers in Industry*, **58**: 667-676.

Rankin, J., Fayek, A.R., Meade, G., Haas, C. and Manseau, A. (2008) Initial metrics and pilot program results for measuring the performance of the Canadian construction industry, *Canadian Journal of Civil Engineering*, **35**: 894-907.

Social Security Organisation (2010), *Annual Report 2009*, Kuala Lumpur

Social Security Organisation (2011), *Annual Report 2010*, Kuala Lumpur

Takim, R., Akintoye, A and Kelly, J. (2003) Performance measurement systems in construction, In: Greenwood, D.J. (Ed.), 19th Annual ARCOM Conference, 3-5 September 2003, University of Brighton, *Association of Researchers in Construction Management,* **1**: 423-432.

The Benchmark Centre for the Danish Construction Sector (BEC) (2006) *Benchmarking Danish Construction*, Copenhagen.

Yu, I., Kim, K., Jung, Y. and Chin, S. (2007) Comparable performance measurement system for construction companies, *Journal of Management in Engineering*, ASCE, **23**(3): 131-139.