

Factors Influencing the Performance of the South African Construction Industry: A Case of Limpopo Province

Khotso Dithebe, Clinton Aigbavboa, Ayodeji Oke and Marvellous Akani Muyambu

Sustainable Human Settlement and Construction Research Centre, Faculty of Engineering and
the Built Environment, University of Johannesburg, South Africa

khdithebe@gmail.com, clintonaigbavboa@gmail.com, emayok@gmail.com and
muyambu@gmail.com

Abstract

The performance of the South African construction industry is a major cause of concern in the country. This study investigates the factors influencing the performance of the construction industry. Primary data was obtained through the questionnaire survey which was distributed to professionals in the construction industry. Quantitative method was adopted whereby a total of 50 survey questionnaires were distributed, however only 35 questionnaires were returned which gave a response rate of 70%. To analyse Statistical Packages of Social Sciences was used for the study. The value for the internal consistency and reliability of the research instrument was 0.866. The study revealed significant factors affecting the performance of the construction industry as; Instability/escalation of construction material prices, project cost overruns, backlogs of payment to contractors, material and equipment and inefficient funding of construction projects. The study contributes to the body of knowledge in relation to what influences the performance of the construction industry. It is evident that economic growth, regulatory bodies, skills and training programmes influences the performance of the construction industry in South Africa. Therefore, an increase in infrastructure investment and firm regulatory implementation measures by CIDB can accelerate the economic growth and improve the performance of the construction industry.

Keywords: Contractors, construction industry, performance, economic growth, CIDB, Limpopo province

1. Introduction

The construction industry renders a vital role in the economic growth of developing countries. This is seen through the production of much needed infrastructure that is required for development and growth of the economy, construction productivity as well as the wellbeing of the citizens (Dlamini, 2012:1). Ramachandra, Olabode and Rotimi (2009:1) similarly shares that the construction industry contributes significantly in the growth of the South African economy, as it produces infrastructure that is required for the development of other productive activities in the country. The growth of any economy is measured by the rate of physical infrastructure development such as roads, bridges, harbours and buildings

Therefore the construction industry has a potential to bridge inequality in the country by generating employment and opportunities for jobs to skilled, semi-skilled and unskilled work force. Stats SA (2014) states that, the construction industry creates employment to more than 1.4 million people all over the country, it helps the formal and informal sectors to generate income and contribute to the growth of the economy by creating employment. The driving force behind the government investing more in infrastructure development is to help eradicate poverty in the country, reduce unemployment and to achieve high economic growth (Mosenogi, 2011:1).

However, the success or performance of the construction industry immensely depends on the national economy. If there is an increase in government expenditure there will be a direct increase in the growth of the economy through the fiscal policy growth or extension. The increasing of spending in government leads to mass production increase and this then leads to an increase in total demand, which will eventually cause an increase in total Gross Domestic Product (Luus, 2003:27). The construction industry does cause influence economic growth or national productivity, in the sense that construction activities or outputs affect other sectors of the economy through the development of roads, airports, water and power infrastructure (Tang and Ogunlana, 2003: 128).

Given the importance of construction industry performance in developing countries, South Africa in particular, there are still some alarming bottlenecks encountered towards infrastructure development. If these bottlenecks are not addressed sooner, the economy of the developing countries will begin to deteriorate. As a result the ultimate objective of this study is to extensively and holistically investigate endogenous and exogenous factors influencing the performance of the construction industry in South Africa.

2. Factors influencing the performance of the construction industry

The construction industry in South Africa is facing many difficulties that influence the performance of the construction industry directly. Existing studies found out that there are factors said to influence the performance of the construction industry in South Africa. This study will thus extensively outline and discuss the factors influencing the performance of the construction industry in South Africa.

2.1 Public sector capacity

As indicated by Mbande (2010), there are deficiencies inside the aptitudes area of South Africa and state possessed organisations. The Construction Industry Development Board (CIDB, 2004) in South Africa expresses that open area limit is an effective constraint to feasible development of the development business and framework conveyance in South Africa. As Milford (2010) enunciated, the failure of people in general part limit has come about to wasteful of subsidizing development extends by the administration and as a rule, excesses of over a half year in installment to temporary workers. Van wyk (2004) observes that the inability of the South African government to spend funds received and the inadequacy to assess open private organisation plans submitted is a genuine. More so, mismatch between available skills and required skills continue to negatively affect the performance of the construction organisations.

2.2 Mismatch between available skills and required skills

Mbande (2010) shares that there are conflicts of mismatch because of the inadequacy of administration conveyance and lack of skills in the construction business in South Africa. As indicated by the report by CIDB (2004) suggests that skills given to workers by means of Further Instruction and Training (FIT) were immaterial to the requirements of the development business and this brought about skills gap and a genuine decrease in the capacity of the expert part inside the development business. Van wyk (2004) communicates an assessment that, the greater number of the business' members who have no training nor a degree are a genuine obstacle to advancement of the business.

2.3 Critical Global, Credit and Interest Rate Issues

Lewis (2007) underscores the impact of globalisation on the development of enterprises that are as yet creating or engaging in worldwide trading to broaden financial underdevelopment. In this manner representing a test to the improvement, and the development of construction businesses globally. Ramachandra, Olabode and Rotimi (2009:7) observes that bringing together construction administrations could really have an economic impact on the indigenous development segments of the developing nations. Borrowing power for infrastructure projects of many nations is restricted, and this affects the economic performance of the construction industry. When the accessibility of funds have been minimised, construction projects are the ones that suffer the most (Luus, 2003). The engineers require the banks to back the building procedure and the buyer needs to get to a home loan to fund the buy of a house or condo. Moreover, contract rates have gone up in the vicinity of 13% and 24%, causing generous issues, with family units

thinking that it's hard to manage the cost of the higher intrigue installments and subsequently, neglecting to pay their home loan securities (Lewis, 2007).

Furthermore, as much as global integration encompasses recognizable benefits, there are also shortfalls, one being the increase cost of building materials. The increase in global interests' rates affects the affordability of building materials. Materials represent as much as 60% of aggregate project costs (South African Construction Industry Status Report, 2004). South Africa creates its own key materials and depends on imported hardware. Hence, increments in material expenses directly increases project cost, if not catered for in the project this can badly affect the performance of the construction industry. The CIDB (2007) investigate the Building and Construction Sector in South Africa, it also takes note of that the costs of unpredictable building materials, for example, steel, bond, sand, copper, timber, polyvinyl chloride (PVC) channels, bitumen and stone work expanded by up to 100% between October 2000 and 2006, which economically affect the performance of the construction industry entirely. The CIDB is the body responsible for the regulation of such issues in the construction industry. More so, the CIDB (2004) report expresses that since 1994, the South African Government has passed more than 1,000 bits of enactment, which have brought forth various directions, on how to improve the performance of the construction industry. These indicators address affected delicate and acquisition methodology, BEE, arranging authorizations and controls, skills improvement, as well as improving and business practices.

2.4 The impact of technological advancement and communication

Ofori (1990) discusses that South Africa is among the developing countries that is slightly advanced technologically, compared to nations such as Nigeria. Technological advancement brings about creativeness and innovation, which is key component for improved performance in the construction industry. In any case, the developing benchmarks of innovation inside the nation and abroad have a tendency to restrict the extent of works of the activities that can be executed, this includes the required material, gear and the accessibility of staff. There is additionally a difficult issue with clients approving new and improved building techniques and imaginative building frameworks that could contribute to the expected performance of the construction industry. Small and emerging organisations can be advanced by efficient administration arrangement utilised to work in numbers to ease neediness and lift the economy (CIDB, 2007). It will be unjust to confer the importance of technological advancement without including the pivotal role played communication systems in the construction industry. Emuze and James (2013:45) expressed that communication is one of the key variables which impacts the construction processes to some degree. Communication is hence a key factor in the development business. The absence of compelling communication among people affects employee and organisational performance, which in turn deteriorated the performance of the industry all together.

2.5 Delivery capacity and performance

Business disappointment, as indicated by Arditi, Koksai and Kale (2000), is the inadequacy of a firm to pay its commitments when they are expected. The CIDB (2004) report features that the disappointment rate of South African development organisations is unsatisfactorily high. The report again demonstrates that there were 532 liquidations of development organisations in 2004, 371 out of 2002, 554 of every 2001 and in general, 1,400 organisations that couldn't stay reasonable in the 2002– 2004 period. As indicated by this report, there has been a long haul decrease in gainfulness in the business, and many organisations affirm benefit levels as low as 1%. Windapo and Cattell (2011), in an investigation of CIDB-enrolled assembling and structural designing temporary workers, found that there was a lessening of 801 (or 8%) in the aggregate number of contractual workers enlisted in 2010 contrasted with 2009. It is clear from the discoveries by van Wyk (2004) on the execution of the development business that the high rate of big business disappointment reflects instability, elevated amounts of non-culmination, poor administration and low efficiency, which continuously affect the performance or the existence of the construction organisations.

2.6 Availability of infrastructure

Human settlement expects foundation to maintain them. A range can't be produced without foundation, for example, power, pipe-borne water, streets, streetlights and sewage transfer frameworks (Ofori, 1990). As indicated by the CIDB (2007), the legislature of South Africa spends a lot of money on enhancing its old and devalued urban and rustic

infrastructure. There is additionally a gigantic test concerning restrictions on electrical limit (Eberhard, 2008). The power creating organization in South Africa, ESKOM, has an ostensible producing limit of 39,154 megawatts (Mbendi.com, n.d). As per reports water shortage is additionally going to end up plainly an expanding challenge. In specific cases, for example, top of the line lodging bequest advancement in new ranges, private property engineers are progressively conveying lodging related framework as an additional cost of the improvement (Kihato, 2012). Besides, for smooth advance of the work nearby, framework offices are required, and in situations where these offices are inaccessible, a temporary worker must make arrangements for them.

2.7 Increases in the costs of building materials

Materials represent as much as 60% of aggregate venture costs (Bourne, 1981; Haskell, 2004). South Africa creates its own key materials and depends on imported hardware. Hence, increments in material expenses inside the business are an outcome for concern. The CIDB (2007) investigate the Building and Construction Sector in South Africa takes note of that the costs of unpredictable building materials, for example, steel, bond, sand, copper, timber, polyvinyl chloride (PVC) channels, bitumen and stone work expanded by up to 100% between October 2000 and 2006.

3. Methodology

This study determined factors influencing the performance of the construction industry. The study was undertaken in the Limpopo Province, South Africa and a quantitative method was adopted. Data for this paper were obtained from both primary and secondary sources, for obtaining the primary data; a well-structured questionnaire was distributed to construction professionals such as Architects, Quantity surveyors, Structural engineers, Electrical engineers, Mechanical engineers, Civil engineers, Project Managers, Construction managers and construction project managers, from contracting companies, consultant offices and public sector (Government). The questionnaire was designed based on information emanating from reviewed literature. Data collection was through self-administered questionnaires, which were distributed physically in the determined research area, in the Limpopo province. Out of the 50 distributed questionnaires, 35 were received back which represents 70% return rate. The questionnaire adopted was designed in sections with the first section seeking data on the background information of the respondents. The second section sought data on factors influencing the performance of the construction industry from the nominated respondents. The following five point Likert scale was adopted; 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree. The secondary data was obtained from a thorough review of literature on factors influencing the performance of the construction.

The data collected was analysed using Statistical Package for the Social Sciences (SPSS) computer software. The method of data analyses include the use of percentage to analyse the background information of the respondents, whilst for Section B mean item scores, and Standard Deviations were used to rank factors influencing the performance of the construction industry. The SPSS was further used to measure the internal consistency and reliability of the selected variables, it revealed different Cronbach's alpha (α) for individual variables as well as the section, showing clearly the reliability and the internal consistency of the findings entered. Cronbach's alpha value generated was 0.886, which clearly represents that there was internal consistency. This shows that the instrument used is reliable since the degree of reliability of an instrument is more perfect as the value tends towards 1 (Moser and Kalton, 1999).

4. Findings, analysis and discussions

4.1 Background information of respondents

The findings of the study revealed that the educational qualification of the respondents only 8.6% had a matric certificate, 34.3% had a post matric or diploma, while 28% were in possession of bachelor's degree. More so, 11.4% of the respondents had acquired an honour's degree, 17.1% a master's degree and no one amongst the respondents held a doctoral degree. Furthermore, the findings showed that 31.4% of the respondents were Quantity Surveyors,

28.5% were Civil Engineers, 22.9% were Project Managers, 11.4 % were Construction Managers, 5.7% were Electrical Engineers and none of the respondents were architects, mechanical engineers and construction project managers. The study also displays the respondents' work experience. It shows that 40% of the respondents had between 1-5 years of working experience, 25.7% had 5-10 years' experience, 17.1% had 10-15 years' experience, 14.3% had more than 20 years' experience and 2.9% had 15-20 years' experience in the construction industry. Additionally, the findings show that 43% out of the 35 respondents are working for consultants, while 29% were working for Public sector (Government), and 28% were working for contractors. Lastly, the findings revealed that 42.9% of the respondents executed more than 20 projects, 22.9% between 1-5 projects, 17.1% executed 5-10 projects, 17.1% executed 10-15 projects and none of the respondents had not executed project between 15-20 projects in the construction industry.

4.2 Factors influencing the performance of the construction industry

The factors that were determined through the review of literature were now analysed and ranked in a descending order according to their mean item scores and standard deviations. . A 5 point Likert scale was adopted for the rating with 5 being Strongly Agree, 4 being Agree, 3 being Neutral, 2 being Disagree, and 1 being Strongly Disagree. Result in Table 1 shows the ranking of the identified factors. From the table it is evident that the tabulated factors have a great impact on the performance of the construction industry, all the factors had a mean item score of more than the average. Even so there are factors that had a major impact than others, they include; Instability/Escalations of material prices (MIS=4.43; SD=0.698), project cost overrun (MIS=4.37; SD=0.690), backlogs of payment to contractors (MIS=4.31; SD=0.867), material and equipment (MIS=4.23; SD=0.843), budget updates for construction projects (MIS=4.23; SD=0.843), incapacity to spend funds received for construction projects (MIS=4.17; SD=0.857) and inefficient funding of construction projects (MIS=4.17; SD=0.857). All the above variables are categorized under financial factors. More so, significant regulatory factors that affected the performance of the construction industry include planning permissions and control (MIS=4.03; SD=0.923), skills development (MIS=3.97; SD=0.822), employment and labour practices (MIS=3.86; SD=0.9740), black economic empowerment (MIS=3.86; SD=0.845), and lastly business practices (MIS=3.77; SD=0.808). Time factors analysed which also showed an importance influence on the performance of the construction industry, these include deficiency of skills (MIS=4.11; SD=0.718), access to construction materials (MIS=4.06; SD=0.684), importing construction services (MIS=4.03; SD=0.923) and time needed to implement construction projects (MIS=3.91; SD=1.011)

These findings are in agreement with Mbande (2010) that the deficiency of skilled labour in South Africa affects the performance of the construction industry, Van Wyk (2003) also adds that skills and training play a significant role towards the success of any business, in this case construction entities, without skilled labour employee performance deteriorates which directly affects organisational performance. Lewis (2007) also emphasises the impact of globalisation on the performance of the construction industry on nations that are as yet engaging in worldwide trading. Global integration in the construction industry is inadequate, Raftery *et al* (1998) enunciates that global participation and engagements with international corporates could really enhance the performance of the construction industry in South Africa, the findings are directly in agreement that global integration is pivotal in the construction industry. The findings further agree with Van wyk (2004) that the inability of the South African government to adequately fund construction projects affects the performance of the construction industry, this includes government (client) failing to pay contractors for work done which affects the development of the small and emerging construction companies.

With a minimal number of materials natively manufactured, the construction industry import a large portion of materials from other countries. Since construction materials are a key product in the process of construction, the import pricing usually have an impact on the project estimation made initially, the CIDB (2007) is compelled with the responsibility of regulating the costs of unpredictable building materials, this includes steel, bond, sand, copper, timber, polyvinyl chloride (PVC) channels, bitumen and stone. As a result the findings along with the reviewed literature makes great emphasis on the importance and impact of the cost of building materials towards the performance of the construction industry.

Table 1: Factors influencing the performance of the construction

Factors influencing the performance of the construction industry	\bar{x}	σX	R
Instability/Escalations of material prices	4.43	.698	1
Project Overrun Costs	4.37	.690	2
Inflation Rate/ Price stability	4.37	.843	3
Backlogs of payments to Contractors	4.31	.867	4
Material and Equipment costs	4.23	.843	5
Budget updates for Construction Projects	4.23	.843	6
Incapacity to spend funds received for construction projects	4.17	.857	7
Inefficient of funding construction projects	4.17	.491	8
Exchange rate	4.11	.832	9
Incapacity of service delivery	4.11	.718	10
Lack of effective communication	4.09	.742	14
Lack of education and training	4.09	.887	15
Deficiency of skills	4.03	.923	18
Skills development and training	4.03	.923	19
Relevant Skills for construction	4.00	.874	20
Competitive salary	4.00	.874	21
Business practices	3.97	.822	22
Infrastructure availability	3.94	.725	23
Number of new projects	3.94	.802	24
Employee motivation	3.94	.838	25
Availability of Resources	3.91	1.011	26
Importing of construction services	3.86	1.033	29
Black Economic Empowerment	3.86	.974	30
Planning permissions and controls	3.86	.845	31
Working conditions	3.63	.843	43
Access to construction materials	3.57	.917	44

\bar{x} = Mean Item Score; σX = Standard Deviation; R= Ranking

5. Conclusion

The aim of the study was to determine the factors known to influence the performance of the construction industry in South Africa. The reviewed literature showed the financial factors, time related factors, productive factors, regulation factors and the human resource factors that influence the performance of the construction industry. The findings revealed that the financial factors are instability of construction material, project cost overrun, backlogs of payment to contractors, material and equipment, budget updates for construction, exchange rates, cost control system, income inequality. In time factors influencing the performance of the construction industry deficiency of skills, access to construction material, importing construction services. Regulation factors influencing the construction industry include planning permissions and control, skills development, employment and labour practices, black economic empowerment. In productive factors, availability of equipment, limited scale of construction project, project

complexity. While human resources factor include, competitive salary, and employee motivation. Incapacity to spend funds received on construction projects. The study recommends that the regulatory body which is the CIDB plays a significant role towards protecting the small and emerging contractors from being exploited by the already developed contractors, skills and training should be transferred, safer working environment, mentorship programs should be put in place, as well as technical assistance should be provided. The empowerment of the small and emerging contractors has a direct influence on the performance of the construction industry, more so, the regulatory body ensure to undertake follow ups on the outstanding costs for the work done by various contractors. Lastly, the influence of health and safety, quality and time constraints on the performance of the construction industry should be perused for future studies.

Reference

- Arditi, D., Koksai, A and Kale, S., Business failures in the construction industry, *Journal of Engineering Construction and Architectural Management*, vol. 7, no. 2, pp.120-132, 2000.
- Construction Industry Development Board (CIDB)., Skills for infrastructure delivery in South Africa: the challenge of restoring the skills pipeline. Pretoria, South Africa: CIBD, 2007.
- Construction Industry Development Board (CIDB)., The National Infrastructure Maintenance Strategy in support of ASGISA and Government Growth Objectives. Pretoria, South Africa: CIBD, 2004.
- Dlamini, S., Relationship of construction sector to economic growth. School of Construction management and engineering, University of Reading, UK, 2012.
- Emuze, F.A., Performance improvement in South Africa .P.h.D. Thesis. Faculty of Engineering, the built Environment and Information Technology, Nelson Mandela University, Port Elizabeth, South Africa, 2011.
- Lewis, T.M., Impact of globalisation on the construction sector in developing countries. *Construction Management and Economics*, vol. 25, no. 1, pp.7-23, 2007.
- Luus, C., The Absa residential property market database for South Africa: Key data trends and Implication. Proceedings. *The IMF/BIS Conference on Real Estate Indicators and Financial Stability*. Washington DC, 27-28, 2003.
- Mbande, C., Overcoming construction constraints through infrastructure deliver. Proceedings: The Association of Schools of Construction of Southern Africa (ASOCSA), *Fifth Built Environment Conference*, 2010.
- Milford, R., Republic capacity payment and procurement issues should be a challenge to the operatives of contractors in South Africa. Paper presented at the Fifth Built Environment Conference of the Association of Schools of Construction of Southern Africa. Durban Africa, 18-20 July, 2010.
- Mosenogi, J.M., An impact analysis of construction sector on economic growth and household income in South Africa. *Journal of Management and Administration*, North West Department of finance, 2011.
- Ofori-kuragu, J. K. and Ayarkwa, J., The Case for a Construction Industry Council in Ghana, vol. 21, no. 12, pp.131–149, 2013.
- Ramachandra, T., Olabode, J. and Rotimi, B., The relationship between construction sector and the national economy of Sri Lanka, 1–10, 2009.
- South African Construction Industry Status Report., Synthesis Review on the South African Construction Industry and its Development. Available at: http://www.cidb.org.za/documents/kc/cidb_publications/ind_reps_other/ind_reps_status_reporeport_2004.pdf (Accessed on 20 June 2017), 2004.
- Statistics South Africa (Stats SA)., Statistical Release P0441 Gross Domestic Product Fourth Quarter: 2009. Pretoria, South Africa: Stats SA. Available at: www.statssa.gov.za (Accessed on 12 June 2017), 2010.

Tang, Y.H and Ogunlana, S.O., Modelling the dynamic performance of a construction organization, *Journal of Construction Management and Economics*, vol. 21, no. 2, pp.127-136, 2013.

Van Wyk, L., A review of the South African Construction industry. Part 2: Economic, Regulatory and Public Sector Capacity Influences on the Construction Industry. Pretoria, South Africa, 2004.

Windapo, O. and Cattell, K., The South African Construction Industry: Perceptions of Key Challenges Facing Its Performance, Development and Growth. *Journal of Construction in Developing Countries*, vol. 18, no. 2, pp.65–79, 2013.

Biographies

DITHEBE Khotso is a scholar at the University of Johannesburg, currently registered for PhD in Construction Management. He bagged his Master degree from the Department of Construction Management and Quantity Surveying, University of Johannesburg. During his master's programme, he was employed as a Tutor in his department, where he assisted in teaching and conducting of researches. This employment gave the platform for an increased interest in research.

OKE Ayodeji Emmanuel is a Quantity Surveyor by training and a Ph.D. holder in the same discipline. He bagged his B.Tech degree in Quantity Surveying from Federal University of Technology, Akure, Nigeria in 2006 with a first class (Hons.). He is a reviewer for various local and international reputable Journals. To his name and in collaboration with academia within and outside Nigeria, he has authored a good number of journals and conference papers both locally and internationally. He received 2016 Emerald Literati Award for the article on Structural Equation Modelling of Construction Bond Administration, as a highly recommended paper in the *Journal of Financial Management of Property and Construction*. He is one of the authors of the book titled sustainable value management for construction projects. He is currently a Post-Doctoral Research Fellow at the Department of Construction Management and Quantity Surveying, University of Johannesburg, South Africa.

AIGBAVBOA Clinton Ohis is currently the Vice-dean: Postgraduate Studies, Research and Innovation (PSRI) of the Faculty of Engineering and the Built Environment (FEBE) of the University of Johannesburg. He also serves as the Head: Sustainable Human Development and Construction Research Centre, in the Department of Construction Management and Quantity Surveying, School of Civil Engineering and the Built Environment, FEBE. He is an Associate Professor in the Department of Construction Management and Quantity Surveying, University of Johannesburg, South Africa. As a Ph.D. candidate in 2013, he was among the top 10 researchers in UJ; while in 2014 and 2015, he was the leading research output contributor in the University. Prof Aigbavboa has published more than 400 peer-reviewed articles in journals, conference proceedings and in book chapters.

MUYAMBU Marvellous Akani is a graduate of the Department of Construction and Quantity Surveying in the Faculty of Engineering and Built Environment, at the University of Johannesburg. He bagged his Bachelor Degree from the department in 2017.