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CONSTRUCTION STAKEHOLDERS' PERSPECTIVE ON EXTERNAL RELATED RISK FACTORS INFLUENCING CONSTRUCTION PROJECT PERFORMANCE

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ABSTRACT
The construction industry is extremely complex, with dynamic project environments creating an atmosphere of high uncertainty and risk. For that reason, risks in construction project have become an inevitable feature and the industry is susceptible to numerous business, socio-political and technical risks that negatively influence project delivery. This study therefore investigates the causes of external risks factors in construction project delivery and the effect on project and organisational performance so that efficient control measures can be designed to minimise its occurrence. A quantitative research design was adopted, and the sample comprised of randomly selected construction professionals in the Western Cape Province. The data was statistically analysed using descriptive and inferential analyses. The salient findings revealed that socio-political-related risk factors were the major causes of risks during construction project delivery, these factors include labour strikes and disputes due to union issues, excessive influence by government on court proceedings regarding construction project disputes, and constraints on the availability and employment of expatriate staff. In addition, the study revealed the impact of external related risks on projects and organisational performance, and it was found that cost overrun was ranked the most significant on project performance and disputes between parties to the contract was ranked the most significant on organisational performance. In the context of the South African construction industry, previous studies tended to focus more on internal risks as opposed to external risks. Therefore, this study makes a contribution to the body of knowledge on the subject within a previously unexplored context. The study provides insights with regard to the sources of external related risks associated with construction project within the context of the South African construction industry.

Keywords: Construction project; construction stakeholders; external related risk; project performance; socio-political risk

1. INTRODUCTION
The construction industry is susceptible to risks, particularly external related factors because of the unusual characteristic of construction processes, such as long time periods, challenging environment, complex procedures, monetary force and different organisational structures (Zou, Zhang and Wang, 2006). Kuang (2011) opined that construction projects have a number of features, including specific goals, limited time periods, financial constraints and economic demands, particular organisational and legal contractual terms, complication and systematic characteristics. According to Tah, Thorpe and McCaffer (1993), external risks are those factors that are predominant in the external environment of projects, including risk related to inflation, fluctuations in currency exchange rate, change in technology, client-

related changes, politics, inclement weather conditions and major accidents or natural disasters. Furthermore, external risk is relatively uncontrollable and there is the need to continually examine and predict its occurrence in the context of a company's strategy (Zavadskas, Turskis and Tamošaitiene, 2010; Tah *et al.*1993). Any investment project is a complicated system, but this is even more so for construction projects, as there are several external risk aspects and complex relations, which will impact the project. Therefore, if external risk factors are not considered, the factors will cause damage because of the inevitable decision-making errors (Kuang, 2011). Construction in South Africa faces many external risks. According to Chihuri and Pretorius (2010), some of the major external risks associated with construction projects in South Africa are: lack of power (electricity crisis), skills shortages, and escalating costs in construction materials. In a similar vein, Shunmugam and Rwelamila (2014) attributed the lack of progress in the South African construction industry to the rapid upsurge in fuel prices, poor performance of the local currency (Rands) compared to other major currencies, including the British pound and the US dollar, combined with a high level of inflation. Shunmugam and Rwelamila (2014) add that one of the worst blows to the industry surfaced in 2011, where some of the biggest construction firms were charged with anti-competitive behaviour. Gitau (2015) stated that programming and design may entail risks such as over-design, poor constructability, poor estimating and scope creep. On the other hand, the construction phase is susceptible to external risks relating to inflation, escalating costs in building materials and delays in obtaining permits. It is evident from the above discussion that construction projects are faced with many external risks which often impact on project delivery adversely in terms of cost, time, quality, safety and environment. In addition, the magnitude of these effects as well as the frequency of occurrence have not been adequately assessed. Therefore, the study aims to investigate the most significant factors that contribute to the major causes of external risk during construction and its impact on construction project performance. The purpose of the study is pursued by analysing quantitative data obtained from randomly selected construction professionals based in Cape Town, South Africa. The structure of this paper presents brief discussions with regard to the extant literature pertaining to sources of external risks and its impact of project performance. The methodological approach for collecting and analysing the data is outlined in the subsequent section. Thereafter, the findings from the survey are presented and discussed. The final section presents the conclusions of the study.

2. LITERATURE REVIEW

2.1 Taxonomy of external risk factors influencing construction project performance

An extensive amount of literature has been published with respect to external related risk factors influencing construction project performance (Al-Shibly, Louzi and Hiassat, 2013; El-Sayegh, 2008; Qammaz, 2007; Van Thuyet, Ogunlana and Dey, 2007). According to Qammaz (2007), external risks may originate from outside the project and in most cases, are out of the control of contractors. Rezakhani (2012) for instance, categorised the external risk factors into two groups namely unpredictable/uncontrollable and predictable/controllable. Al-Shibly *et al.* (2013) also identified eight primary external risk factors including: economic and globalisation dynamics; environmental constraints; government; unanticipated circumstances; statutory requirements; political controls; health and safety issues outside the control of the project team, and socio-cultural issues. Qammaz (2007) opined that the sources of external risk include adverse physical conditions, design, managerial complexities, client's financial resources, techniques and technology, extent of subcontractor availability, and availability of resources. Furthermore, Banaitiene and Banaitis (2012) stated that external risks may be categorised into three main groups such as lack of knowledge regarding social conditions, as well as lack of knowledge regarding the local economy and political situations. The authors further indicated that unfamiliar and new procedural formalities, regulatory frameworks and governing authorities may also influence construction project performance. According to Li and Liao (2007), political risks are related to amendments to government laws or legislative systems, regulations and policies, as well as inadequate administration systems. Economic risks are related to inconstancy of economy in the country, repayments and defaults in the manufacturing industry, inflation and funding issues. Zavadskas, Turskis and Tamošaitiene (2010) analysed Lithuanian economic activities related to construction. The economic disasters in the Lithuanian construction industry were attributed to contractors' inability to assess the probability of the risk events and their cost impact. According to Ginevičius and Podvezko (2009), social risks are increasingly significant to any effort at risk allocation and describe a situation whereby the project outcome can be significantly influenced due to political interference and social pressures from role-players having vested interests in a project.

2.2 Effect of external risks on construction projects

The effect of external risk on project delivery can be detrimental in a number of ways. The most serious consequences of external risk identified by Radujkovic and Car-Pusic (2004) were cost and time overruns. This is corroborated by Wang and Chou (2003) who asserted that external risks and uncertainties associated with construction projects, causes cost overrun, schedule delay and lack of quality both during the progression of the projects and at the end. Baloi and Price (2001) argue that poor cost performance seems to be the norm rather than the exception in most construction projects, and both clients and contractors suffer significant financial losses due to cost overruns. These events are among the most common outcomes which contribute to project failure scenarios. Cerić (2003) also adds that external risk may have a detrimental impact on budgeted costs, the duration of the project and the project quality.

2.2.1 Effect of external risk on the cost of project

Cost overruns are very common in the construction industry. Few projects are accomplished within approved costs (Subramani, Sruthi, and Kavitha 2014). A study conducted by Shen, Wu and Ng (2001) revealed that increase in the cost of a project as a result of policy change was ranked as the most common cause. Baloyi and Bekker (2011) maintained that the common causes of construction cost overruns are fluctuations in the price of construction materials, additional work or changes to work emanating from clients, time overruns caused by contractors, poor estimates and material take-off and delay in payments.

2.2.2 Effect of external risks on project time

Timely accomplishment of a construction project is regularly perceived as a major determinant of project success by clients, contractors and consultants (Bowen, Hall, Edwards, Pearl, and Cattell, 2012). However, if a project is delayed due external factors, the timeframe is either extended or accelerated, which consequently results in additional project cost. Gajewska and Ropel (2011) indicated that schedule overrun leads to an upsurge in project costs that must be incurred by either the clients or contractors as a result of deviation from the works. For example, unexpected ground conditions are seen as the second most serious external risk to project delays (Shen, 1997). In addition, the fluctuation in labour market does typically affect project progress (Shen, 1997).

2.2.3 Effect of external risks on project quality

According to Schiffauerova and Thomson (2006), the effective way to enhance customer satisfaction is by improving quality. However, any serious attempt to improve quality must be considered with the costs associated with achieving quality. Rezaian (2011) suggested that project managers and management accountants endeavour to reduce the total cost, time and risk while maximising the overall quality. Bodicha (2015) stated that external risk events such as acts of God, financial and economic risks, physical risks, political and environmental risks associated with the construction industry will have a detrimental effect on the quality of project outcome. In addition, the PMI (2008) reported that the occurrence of external risks may positively or negatively influence at least one of the project's objectives, including quality.

3. METHODOLOGY

3.1 Design and sample size

In order to achieve the aim of the study, a quantitative research design was adopted, and the sample consist of randomly selected construction professionals in the Western Cape Province. Specifically, only construction firms registered on the CIDB database formed part of the study, whereas in the category of consulting firms, only those registered on the Professions and Projects Register were sampled. The population of this study involved architects/designers, construction project managers, contractors, engineers, quantity surveyors, and risk management teams in the Western Cape. With regard to consulting firms, the list was extracted from the 2018 Professionals and Projects Register. It can be seen from Table 1 that 637 registered professionals formed the total population within the Western Cape. In addition, the population for contractors was obtained from the CIDB database for contractors. It is evident that 750 contractors registered between Grades 3 to 9 were used as the population. Therefore, the total population for the study amounted to 1387, as depicted in Table 1.

Table 1: List of combined professionals and contractors

Population	No
Professional	637
Contractors (Grades 3 to 9)	750
Total	1387

To determine a suitable representative sample, the formula recommended by Czaja and Blair (2005) was used:

$$= \frac{z^2 \times p(1-p)}{c^2}$$

Where:
ss = sample size
z = standardised variable
p = percentage picking a choice, expressed as a decimal
c = confidence interval, expressed as a decimal
Considering the above parameters, the sample size was calculated as follows:

$$\text{ss} = \frac{1.96^2 \times 0.5(1-0.5)}{0.1^2} = 96.04$$

From the above computation, the required sample size for the questionnaire survey is 96 respondents. Nevertheless, this figure is required to generate a new sample size from the research population using the following formula, as suggested in Czaja and Blair (2005):

New ss = $\frac{ss}{\frac{1+ss-1}{pop}}$

Where:
pop = population

New *ss* = $\frac{96.04}{\frac{1+96.04-1}{1387}}$ = 89.88

From the foregoing calculations, the appropriate sample size is approximately 90 respondents. A study conducted by Takim, Akintoye and Kelly (2004) reveals that the response rate in a survey could range between 20 – 30%. Thus, in order to make provision for non-response, the sample size was adjusted accordingly. With this in mind, a suitable assumption of 30% in relation to the response rate was considered, and the appropriate sample size was derived as follows:

$$Survey\ ss = \frac{new\ ss}{response\ rate}$$

$$Survey\ ss = \frac{90}{0.3} = 300\ respondents$$

Based on the preceding calculation, it is worth noting that the survey sample size is approximately 300 construction professionals. A random sampling method was adopted to select 300 professionals from the population.

3.2 Survey Administration and data analysis

A questionnaire survey was designed for the study, where closed and open-ended questions were developed to solicit respondents' opinions concerning the major causes of external risks during construction projects and the detrimental effect on project parameters. The research instrument for the survey was divided into different sections, with each section aimed at achieving a particular objective of the study. Section A, the background information, was the first section of the questionnaire. The information collected includes the gender, age, qualification, experience, organisation's role and the respondents' current position in the industry. The second section (section B) collected data with respect to the major causes of external risks during construction projects. A Likert scale question where 1 = Not critical at all, 2 = Slightly critical, 3 = Somewhat critical, 4 = Critical, and 5 = Very critical was used to collect information regarding major causes of external risks. Section C, the third section of the questionnaire, requested information concerning the effect of construction risks on project performance. A Likert scale where 1 = Minor extent, 2 = Near minor extent, 3 = Some extent, 4 = Near major extent, and 5 = Major extent was used to collect information regarding the effect of construction risks on project performance. It is worth noting that 60 respondents, representing 20% of the sample size, willingly participated in the survey. The data was statistically analysed using descriptive and inferential analyses. Descriptive statistics used in this study consist of frequency distribution and measurement of central tendency, such as mean and standard deviation. For the purpose of the research study, the internal reliability was tested on scales questions using Cronbach's coefficient alpha. Inferential statistics was used to validate the data collected through the analysis of variance (ANOVA). The ANOVA was used for establishing whether or not there was a significant difference in agreement of respondents concerning the respective factors.

4. FINDING

4.1 Research Participation

In the first section of the questionnaire, the respondents' general information was collected. The information related to gender, age group, years of experience and level of education from the completed questionnaires was analysed.

Table 2 presents the background information of the respondents. With regard to gender of the respondents of the survey. It is shown that the sample was made up of 11.7% females and 88.3% males. The higher percentage of male respondents indicates the norm of higher participation ratio of males in the construction industry. Concerning the age groups of the respondents. It is evident that 3.3% of the respondents were below the age of twenty-five. The age group between twenty-five to thirty years made up 21.7% of the study participants.

The highest percentage of respondents fell between the ages of thirty-one and forty, representing 28.3% of the total respondents. The age group between forty-one to fifty made up 23.3% of the study participants. The age group between fifty-one to sixty years made up 10% of the study participants. The table indicates that 86.7% of the survey respondents were not older than sixty years of age, while 13.3% of the respondents were above sixty years of age, suggesting that most of the respondents were middle-aged. Regarding academic qualifications, 33.3% of the respondents held a bachelor's degree as their highest educational qualification, 31.7% held a diploma certificate, 20% held a master's degree, 6.7% held a honours degree, 5% held a postgraduate diploma, 1.7% held a Matric certificate, and 1.7% held other qualifications. With respect to work experience of the survey participants in the construction sector. The descriptive analysis revealed that respondents with less than 5 years' work experience in the construction industry represented 25% of the total respondents. Respondents having five to ten years' construction work experience represented 16.7% of the total, while 58.3% of the respondents had been working in the construction sector for more than ten years. The years of experience of respondents were sufficient to achieve the purpose of the study, as a significant 58.3% of the study respondents had more than ten years of work experience in the construction industry. This is not to suggest that the input and work experiences of the respondents working only between 1-5 years is not significant this research.

Table 2: Background information of the respondents

	Gender	Frequency	Percentage
	Female	7	11.7
	Male	53	88.3
	Total	60	100.0
	Age of respondents	**Frequency**	**Percentage**
	Under 25	2	3.3
	25 - 30 years	13	21.7
	31 - 40 years	17	28.3
	41 - 50 years	14	23.3
	51 - 60 years	6	10.0
	Over 60 years	8	13.3
	Total	60	100.0
	Type of qualifications	**Frequency**	**Percentage**
	Matric certificate	1	1.7
	Diploma	19	31.7
	Bachelor's degree	20	33.3
	Honours degree	4	6.7
	Postgraduate diploma	3	5.0
	Master's degree	12	20.0
	Other	1	1.7
	Total	60	100.0
	Years of working experience	**Frequency**	**Percentage**
	Less than 5 years	15	25.0
	5 – 10	10	16.7
	Over 10 years	35	58.3
	Total	60	100.0

4.2 Causes of external risks during construction project

Environment-Related risk

Respondents were asked to rate the level of contribution of environment-related risks as major causes of external risks during construction project; where U = Unsure, 1 = Not critical at all, 2 = Slightly critical, 3 = Somewhat critical, 4 = Critical, 5 = Very critical, and a mean value (MV) ranging between 1.00 to 5.00. It should be noted that 3/5 (60%) factors' MVs are > 3.00, which indicates that generally the risk factors were seen as significant in contributing to poor project performance. Table 3 shows that incomplete environmental analysis had the highest ranking with MV = 3.63, however, the level of contribution according to the respondents can be deemed to be between somewhat critical to critical/critical since the MV fell within the range of > 3.40 to ≤ 4. 20. Stringent regulation having an impact on construction firms' poor attention to environmental issues had the second highest ranking, with MV = 3.28, and new alternatives required to avoid, mitigate or minimise environmental impact had the third highest ranking, with MV = 3.10, this indicates that the degree of contribution of these risk factors can be deemed to be between slightly critical to somewhat critical/somewhat critical since the MVs fell within the range of > 2.60 to ≤ 3.40. Overall, the level of contribution of environment-related risk factors to major causes of external risks can be deemed to be between slightly critical to somewhat critical/somewhat critical, since the AMV = 3.15.

Table 3: Environment-related factors as major causes of risks during construction

Environment-related	**Unsure**	**Response (%) Not critical……………………….Very critical**					**MV**	**SD**	**Rank**
		1	**2**	**3**	**4**	**5**			
Environmental analysis incomplete	5.0	8.3	5.0	20.0	23.3	38.3	3.63	1.50	1
Stringent regulation having an impact on construction firms' poor attention to environmental issues	5.0	6.7	15.0	20.0	35.0	18.3	3.28	1.38	2
New alternatives required to avoid, mitigate or minimise environmental impact	5.0	13.3	11.7	28.3	20.0	21.7	3.10	1.48	3
Force Majeure: such as natural disasters	6.7	25.0	15.0	10.0	10.0	33.3	2.92	1.80	4
Weather and seasonal implications	6.7	11.7	21.7	28.3	16.7	15.0	2.82	1.43	5
Average mean value	3.15								

Socio-Political-Related

The participants of the survey were requested to indicate the level of influence of socio-political-related risk to major causes of external risks during construction project; where U = Unsure, 1 = Not critical at all, 2 = Slightly critical, 3 = Somewhat critical, 4 = Critical, 5 = Very critical, and a mean value (MV) ranging between 1.00 to 5.00. It is notable from Table 8 that 4/6 (67%) of the MVs are > 3.00, which indicates that generally socio-political-related factors may be slightly critical in contributing to the major causes of external risk during construction project. The hierarchy of the descriptive analysis shows that labour strikes and disputes due to union issues had the highest ranking, with MV = 3.75. Excessive influence by government on court proceedings regarding construction project disputes had the second highest ranking, with MV = 3.25. Governments' inconsistent application of new regulations and laws had the third highest, with MV = 3.05. Given that the MVs for the labour strikes and disputes due to union issues is > 3.40 to ≤ 4.20, respondents' concurrence is deemed to be between somewhat critical to critical/critical. On the other hand, respondents' degree of concurrence is considered to be between slightly critical to somewhat critical/somewhat critical for excessive influence by government on court proceedings regarding construction project disputes, and governments' inconsistent application of new regulations and laws since the MV is > 2.60 to ≤ 3.40. Overall, the level of contribution of socio-political-related risk factors to major causes of external risks can be considered to be between slightly critical to somewhat critical/somewhat critical since the AMV = 3.16.

Table 4: Socio-political-related factors as major causes of risks during construction

Socio-political-related	Unsure	Response (%) Not critical..............................Very critical					MV	SD	Rank
		1	2	3	4	5			
Labour strikes and disputes due to union issues	6.7	0.0	11.7	16.7	23.3	41.7	3.75	1.45	1
Excessive influence by government on court proceedings regarding construction project disputes	11.7	6.7	8.3	20.0	25.0	28.3	3.25	1.66	2
Constraints on the availability and employment of expatriate staff	8.3	8.3	16.7	15.0	40.0	11.7	3.05	1.47	3
Governments' inconsistent application of new regulations and laws	10.0	8.3	15.0	25.0	16.7	25.0	3.05	1.61	4
Insistence on use of local firms and agents	6.7	6.7	28.3	15.0	25.0	18.3	3.0	1.47	5
Customs and import restrictions and procedures	10	13.3	15.0	21.7	25.0	15.0	2.83	1.56	6
Average mean value	3.16								

Right of Way-Related

This section examined the degree of contribution of right of way-related risk to major causes of external risks during construction project; where U = Unsure, 1 = Not critical at all, 2 = Slightly critical, 3 = Somewhat critical, 4 = Critical, 5 = Very critical, and a mean value (MV) ranging between 1.00 to 5.00. It is noticeable from Table 5 that 2/12 (17%) of the MVs are > 3.00, which indicates that generally right of way-related factors may be considered as slightly critical in contributing to the major causes of external risks during construction projects. The hierarchy of the descriptive analysis shows that need for "permits to enter" not considered in project schedule development had the highest ranking, with MV = 3.27. Discovery of hazardous waste in the right of way phase had the second highest ranking, with MV = 3.07. Right of way datasheet incomplete or underestimated had the third highest with MV = 3.00. Given that the MVs for need for "permits to enter" not considered in project schedule development is > 2.60 to ≤ 3.40, respondents' concurrence is deemed to be between slightly critical to somewhat critical/somewhat critical. Concerning the second ranked factor, discovery of hazardous waste in the right of way phase, and the third ranked factor, right of way datasheet incomplete or underestimated, respondents' degree of concurrence is considered to be between slightly critical to somewhat critical/somewhat critical since the MVs are > 2.60 to ≤ 3.40. Overall, the level of contribution of right of way-related risk factors to major causes of risks can be considered to be between slightly critical to somewhat critical/somewhat critical since the AMV = 2.91.

Table 5: Right of Way-related factors as major causes of risks during construction

Right of Way-related	Unsure	Response (%) Not critical……………………………Very critical					MV	SD	Rank
		1	2	3	4	5			
Need for "permits to enter" not considered in project schedule development	6.7	11.7	5.0	23.3	28.3	23.3	3.27	1.53	1
Discovery of hazardous waste in the right of way phase	8.3	18.3	1.7	16.7	36.7	16.7	3.07	1.62	2
Right of way datasheet incomplete or underestimated	8.3	10.0	11.7	25.0	30.0	13.3	3.00	1.47	3
Expired temporary construction easements	8.3	10.0	11.7	28.3	31.7	8.3	2.92	1.41	4
Unforeseen railroad involvement	8.3	18.3	5.0	30.0	18.3	20.0	2.92	1.60	5
Condemnation process takes longer than anticipated	10.0	11.7	5.0	36.7	21.7	13.3	2.90	1.49	6
Resolving objections to right of way appraisal takes more time and/or money	8.3	13.3	10.0	26.7	33.3	8.3	2.88	1.44	7
Utility relocation requires more time than planned	6.7	8.3	20.0	33.3	20.0	11.7	2.87	1.35	8
Inadequate pool of expert witnesses or qualified appraisers	11.7	13.3	10.0	20.0	30.0	13.3	2.85	1.61	9
Acquisition of parcels controlled by a state or federal agency may take longer than anticipated	16.7	6.7	8.3	23.3	30.0	13.3	2.85	1.66	10
Utility company workload, financial condition or timeline	10.0	10.0	15.0	26.7	30.0	6.7	2.78	1.43	11
Seasonal requirements during utility relocation	10.0	18.3	13.3	21.7	26.7	8.3	2.63	1.52	12
Average mean value	2.91								

4.3 Effect of External Risks on Project and Organisational Performance

Project Performance

Respondents were asked to rate the level of contribution of the effect of external risks on project performance; where U = Unsure, 1 = Minor extent, 2 = Near minor extent, 3 = Some extent, 4 = Near major extent, and 5 = Major extent, and MV ranging between 1.00 and 5.00. In Table 6, it is evident that all the MVs are greater than 3.00; generally, the findings imply that the survey participants can be deemed to observe that external risk associated with construction projects may contribute in a serious way to poor project performance. With regard to the mean rankings, cost overrun had the highest ranking, with MV = 4.50, quality degradation had the second highest ranking, with MV = 4.26, time overrun had the third highest ranking, with MV = 4.22, and the fourth ranked factor was low productivity on site, with MV = 4.20. The MVs of the top three ranked factors indicate that the respondents' degree of concurrence can be deemed to between a near major extent to major/major extent, since the MVs are > 4.20 to ≤ 5.00. Health and safety had MV = 3.87 and ranked fifth, whilst the impact of the environment on project performance was ranked sixth with a MV = 3.65. The extent of negative impact of these factors on project performance can be considered to be between some extent to a near major extent/near major extent, since the MVs are > 3.40 to ≤ 4.20. Overall, the level of contribution of effect of external risks on project performance is considered to be between some extent to a near major extent/near major extent, since the AMV = 4.12.

Table 6: Effect of construction risks on project performance

Project performance	Unsure	Response (%) minor extent …………………… major extent					MV	SD	Rank
		1	**2**	**3**	**4**	**5**			
Cost overrun	0.0	3.3	1.7	5.0	21.7	68.3	4.50	0.93	1
Quality degradation	1.7	0.0	8.3	8.3	20.0	56.7	4.26	1.13	2
Time overrun	0.0	1.7	3.3	15.0	31.7	48.3	4.22	0.94	3
Productivity	0.0	1.7	6.7	10.0	33.3	48.3	4.20	0.99	4
Health and safety	0.0	3.3	8.3	28.3	18.3	41.7	3.87	1.16	5
Environment	0.0	11.7	6.7	20.0	28.3	33.3	3.65	1.33	6
Average mean value	4.12								

Organisational Performance

Respondents were asked to rate the level of contribution of effect of external risks on organisational performance; where U = Unsure, 1 = Minor extent, 2 = Near minor extent, 3 = Some extent, 4 = Near major extent, 5 = Major extent, and MV ranging between 1.00 and 5.00. In Table 7, it is evident that all the MVs are above the midpoint score of 3.00, which indicates that in general the respondents can be deemed to perceive that external risks associated with construction project may contribute towards the major end of the scale to organisational performance. With regard to the mean rankings, disputes between parties to the contract had the highest ranking, with MV = 4.03. The customer/client dissatisfaction had the second highest ranking, with MV = 3.98. The loss of future work had the third highest ranking, with MV = 3.93. Contractual claims had MV = 3.80 and ranked fourth, disruption of the project plan had MV = 3.55 and ranked fifth, inter-organisational conflict had MV = 3.52 and ranked sixth. The least ranked factor was reduced profit margin, with MV = 3.37. Respondents' concurrence to the first six factors can be considered to be between some extent to a near major extent/near major extent, since the MVs are > 3.40 to ≤ 4.20. On the other hand, the degree of concurrence for the seventh ranked, reduced profit margin can be considered to be between near minor extent to some extent/some extent, since the MV is > 2.60 to ≤ 3.40. Overall, the level of contribution of external risks on organisational performance is considered to be between some extent to a near major extent/near major extent, since the AMV = 3.74.

Table 7: Effect of construction risks on project performance

Organisational performance	Unsure	Response (%) minor extent …………………… major extent					MV	SD	Rank
		1	**2**	**3**	**4**	**5**			
Disputes between parties to the contract	0.0	1.7	8.3	15.0	35.0	40.0	4.03	1.02	1
Customer/client dissatisfaction	1.7	3.3	5.0	21.7	21.7	46.7	3.98	1.21	2
Loss of future work	0.0	6.7	6.7	18.3	23.3	45.0	3.93	1.23	3
Contractual claims	0.0	3.3	6.7	30.0	26.7	33.3	3.80	1.09	4
Disrupt the project plan	1.7	8.3	8.3	25.0	28.3	28.3	3.55	1.31	5
Inter-organisational conflict	0.0	6.7	8.3	26.7	43.3	15.0	3.52	1.07	6
Reduced profit margin	3.3	5.0	11.7	28.3	35.0	16.7	3.37	1.23	7
Average mean value	3.74								

4.4 Testing of Hypotheses

The hypotheses to be tested are as follows:

H1: There is no statistically significant difference between the construction participants' perceptions with regard to the major causes of external risks during construction
H2: There is no statistically significant difference concerning the perception of construction professionals and the detrimental effect of risks on project performance

The ANOVA test was conducted to ascertain if there was no statistically significant difference concerning the construction participants' perceptions and the major causes of external risks during construction. The ANOVA test in Table 8 revealed no significant differences concerning construction participants' perceptions and the major causes of external risks, including, environment-related, and socio-political-related risks since the significance level is $p > 0.05$. However, the ANOVA test revealed a significant difference with regard to construction participants' perceptions and right of way-related risk since $p<0.05$. Hence, the hypothesis that construction participants' perceptions do not vary significantly with regard to the major causes of risks during construction could therefore be accepted. The results are reported in Table 8.

Table 8: ANOVA test for the major causes of risks during construction

		Degrees of Freedom	F	Sig
Environment-related	Between Groups	12	1.189	0.319
	Within Groups	47		
	Total	59		
Socio-political-related	Between Groups	12	1.353	0.222
	Within Groups	47		
	Total	59		
Right of way-related	Between Groups	12	1.999	0.046
	Within Groups	46		
	Total	58		

The ANOVA test was carried out to establish if there was no statistically significant difference concerning the perception of construction professionals and the detrimental effect of external risks on project performance. The ANOVA test in Table 9 revealed that there were no significant differences between the perception of construction professionals and the detrimental effect of risks on project performance, including effects on organisation and effects on project performance, since the significance level of $p > 0.05$. Hence, the hypothesis that the perceptions of construction professionals do not vary significantly with regard to the detrimental effect of risks on project performance could therefore not be rejected. The results are reported in Table 9

Table 9: ANOVA test for effect of risks on project performance

		Degrees of Freedom	F	Sig
Effect on organisation	Between Groups	12	0.759	0.687
	Within Groups	47		
	Total	59		
Effect on Project performance	Between Groups	12	1.118	0.371
	Within Groups	44		
	Total	56		

5. DISCUSSION OF FINDINGS

The quantitative findings reveal that factors that contribute to the major causes of external risk during construction projects are widespread within the South African construction industry, and these factors subsequently impact negatively on project and organisational performance.

Overall, socio-political-related factors were ranked 1st with an AMV = 3.16. The survey participants rated some of the key factors relating to socio-political-related risk as follows: labour strikes and disputes due to union issues with MV = 3.75; excessive influence by government on court proceedings regarding construction project disputes with a MV= 3.25, and constraints on the availability and employment of expatriate staff with MV = 3.05. These findings are supported by Calzadilla, Awinda and Parkin (2012) and Zou, Zhang and Wang (2007). For example, Calzadilla *et al.* (2012) reveal that political situations such as national workers; strikes, nationalisation of basic industries and labour unions may lead to poor productivity on site, which subsequently affects project performance. Zou *et al.* (2007) also stated that the role of government with respect to mitigating political risks in order to create an enabling environment for project development cannot be overemphasised. Nonetheless, overly-prescriptive requirements and bureaucratic approval procedures on the part of government departments may impact on project delivery. Furthermore, Singh, Deep and Banerjee (2017) identify several political risks and among them are limitations regarding the availability and employment of expatriate staff.

Additionally, environment-related factors underlying the major causes of external risks in construction project are ranked second, with AMV = 3.15. Some of the key factors relating to environment-related risk include: environmental analysis incomplete (MV = 3.63); stringent regulation having an impact on construction firm's poor attention to environmental issues (MV = 3.28), and new alternatives required to avoid, mitigate or minimise environmental impact (MV = 3.10).

Furthermore, right of way-related factors influencing the major causes of external risks in construction project are ranked third, with AMV = 2.91. Some of the key factors relating to right of way-related risk include: need for "permits to enter" not considered in project schedule development with a MV= 3.27; discovery of hazardous waste in the right of way phase with a MV= 3.07, and right of way datasheet incomplete or underestimated with a MV = 3.00. This finding aligns with Caltran's (2007) assertion that: lack of provision for entry permits during project schedule development, uncovering of harmful waste in the right of way and right of way datasheet incomplete or underestimated results in poor project performance.

With regard to the negatively impact of risks on project and organisational performance, the hierarchical ranking of the average means for the effect of risks on construction projects indicates that the effect on project performance is ranked first, since the AMV = 4.12. The survey participants rated some of the key factors relating to project performance as follows: cost overrun, with MV 4.50; quality degradation, with MV 4.26, and time overrun, with MV 4.22. These findings are supported by Ali and Kamaruzzaman (2010), Bodicha (2015), and Vaardini (2015). For example, Ali and Kamaruzzaman (2010) state that the major factor contributing to cost escalations in construction projects was ascribed to either poor or imprecise cost estimates. Therefore, the most significant mechanism to adopt in order to control construction project costs would be accurate project costing and financing. Bodicha (2015) also reveals that external risk factors such as incidents as a result of force majeure, economic and financial risks, environment-related and political risks can definitely impact on the project outcome in terms of cost and quality. Furthermore, Vaardini (2015) reveals that time overruns have serious repercussions on project performance and suggests that the factors influencing time overrun during construction projects can be categorised into 12 major groups, consisting of 70 sub-factors.

Organisational performance is ranked second, with an AMV of 3.74. The respondents rated some of the key factors relating to organisational performance. The first is disputes between parties to the contract, with MV = 4.03. This finding is akin to previous studies undertaken by Sithole (2016), who argues that disputes between parties may lead to waste of resources on contracts, and subsequently undermine the concepts of sustainability and value-for-money in contracts, thus affecting the overall health of the construction industry. The second is customer/client dissatisfaction, with MV = 3.98, and is consistent with the findings of Nkado and Mbachu (2002), who contend that client dissatisfaction has serious repercussions for the construction industry and its service providers. For instance, developers/clients would be reluctant to invest their resources in an industry that performs poorly with respect to financial returns. The third is loss of future work, with MV = 3.93, and consistent with the findings of Love, Davis, Ellis and On Cheung (2010).

6. CONCLUSIONS AND RECOMMENDATION

There is a growing awareness of the need for the identification and categorisation of external related risks within both developed and developing countries. Reason being that, external related risks in construction project have become an inevitable feature that negatively influence project delivery. While a number of studies have been conducted in relation to risk in construction projects, limited research has been conducted relative to external related risks amongst construction stakeholders in South Africa. Therefore, the research investigates the causes of external risks in construction project delivery and the effect on project and organisational performance. This involved a questionnaire survey of contractors and consultants involved with construction projects. The results demonstrated that external related risks factors may be classified as environment-related, socio-political-related, and right of way-related factors. The most critical factors relative to environment-related risks include incomplete environmental analysis, stringent regulation having an impact on construction firm's poor attention to environmental issues, and new alternatives required to avoid, mitigate or minimise environmental impact. Concerning socio-political-related risks, the most critical factors include labour strikes and disputes due to union issues, excessive influence by government on court proceedings regarding construction project disputes, and governments' inconsistent application of new regulations and laws. Right of way-related risks include permits to enter not considered in project schedule development, discovery of hazardous waste in the right of way phase, and right of way datasheet incomplete or underestimated. Form the stakeholders' perspective, the impact of external risks on project performance include cost overrun, quality degradation, and time overrun, whereas the effects of external risks on organisational performance include disputes between parties to the contract, customer/client dissatisfaction, and loss of future work.

This study is relevant to both construction practitioners and researchers within the South African construction industry. Risk management team could use the identified external related risk factors as a sound basis to develop a risk probability model that is tailored to the practice of South Africa. With regard to theoretical underpinning, researchers could focus on the adoption and application of risk-based thinking as a process approach for identifying, assessing and analysing, as well as managing and controlling external related risk in the construction industry. Finally, the study contributes to the aspirations of the construction industry development board (CIDB) which seeks to promote performance improvement within the South African construction industry. The identification and classification of the external risks could serve as basis for construction stakeholders in terms of improving decision-making as whether or not to carry out projects.

It is important to note that the paper has its limitations. The first is that the study was conducted using a quantitative approach and the basic premise behind it was to ascertain whether or not there is a significant difference in the perceptions of construction participants' regarding the major causes of external risks as well as the detrimental effect of risks on project performance. In addition, the geographical area of the research was the Western Cape Province of South Africa, hence, only construction professionals based in the Cape Peninsula area were surveyed. For this reason, future research would focus on extending the dataset to encapsulate the whole of South Africa using a mixed-method approach. In terms of statistical tools, it is recommended that the Pareto analysis could be adopted as a tool, based on the 80/20 principle, in order to assist in identifying which risk events may be considered as the vital few and which ones can be classified as the trivial many. Further research should also focus on the development of a risk probability model for predicting the occurrence of risk events in all the project phases. The risk probability model may be adopted as a project management tool to assist project participants to discover which factors could influence the occurrence of risks during the design and construction phase of the project.

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