

Moderating Effect Of Firm Size Between Project Management Practices And Project Performance In Libyan Construction Companies.

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ABSTRACT

The most significant factors that affect project performance are the project management practices. A construction project's planning is an important part of the project management process, and it has a big impact on how the project turns out in the end. The project team works to determine the budget, define the project's scope, and develop a timeline for finishing the work during the planning phase. Project management in Libyan companies has been the subject of several studies, although few of these have focused on project performance inside the company. This study examined the following variables: project planning, project implementation, project monitoring and controlling, project closure, and project performance, with the dependent variable being project performance. The study uses company size as a moderating variable to examine any potential relationship between the moderating effect of firm size on project performance and the independent variables. We adopt three theories to support this study. This study incorporates the resource-based theory, the construction management theory (CMT), and the psychological contract theory. The study employed a quantitative research technique, utilizing a questionnaire, and included 49 construction companies in Tripoli, Libya, as participants. After data collection, the study used SmartPLS and SPSS to analyze the data. The findings indicated that Project implementation has significant effect on the firm size interaction and association between Project implementation and Project performance. Implications and limitation are also discussed in this study.

Keyword: Construction Management, Project management, Project performance, Resource Based Theory, firm size, project management methods, project planning, project implementation, and project closure



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INTRODUCTION

The project management practices have a substantial impact on the prevalence of project performance. It is necessary to adopt project management practices that significantly impact the project performance in order to increase the levels of project performance. The influence of project performance, which it has a substantial impact and influence to control the level of project performance and can be used as an effective tool to maintain good level of performance of the companies (Younus et al, 2022).

The performance of a project is a primary consideration in any project, and different strategies are usually employed to ensure better project performance. Over time, the studies have attempted to examine the different project management practices affecting construction projects' performance. Time and cost are two critical indicators of project success; however, studies have been highlighted that 9 out of 10 projects experience cost overruns due to improper estimation (Ling et al., 2009; Suk et al., 2017; Unegbu et al., 2020), another

study also stated the cost overruns are highly as 183% (Odeck, 2014; Love et al., 2012), suggesting that the project management practices are not effective. Therefore, this study intent to investigate budget and how the cost of project implement and manage when the project start.

The project management practices, specifically in project phase, which are; Scope, budgeting, Work breakdown structure, scheduling, communication plan and Risk management, have a substantial influence on the performance of Construction projects. In the past few years in Libya, there has been an increase in the number of developers bringing in different models of construction to the construction sector. However, there exist several critical elements that have arisen in relation to the project performance executed by the developers (Kiula et al,2017). According to Musyoka (2017), the success of these construction project often depends on the project management practices employed in particular projects.

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While the reviewed studies have examined the link between project management practices and the performance of most public and other construction projects, Project management practices play a crucial role in the performance of most public and other construction projects. Properly implemented project management techniques can help ensure that projects are completed on time, within budget, and to the satisfaction (Musyoka, Gakuu, & Kyalo 2017).

The studies focusing on the influence of project management practices on the performance of Construction projects in Libya could not be found. Furthermore, public and private construction projects are faced with different circumstances and challenges. Therefore, the current study attempts to address the gap by project planning, project implementation, project monitor and control, project closure on the performance of Construction projects, and it was limited to the Construction projects in Libya.

LITERATURE REVIEW

It is impossible to overstate the significance of facilities or products produced by the construction industry in achieving national development. Construction projects house all other economic activities, such as the provision of buildings for the Securities Exchange Commission, banking sectors, courts of law (Algwyad & Talib, 2019). The distinctive and project-specific conditions in which the customers, investors, and contractors of the construction business work affect the caliber of the sector's products. Architects, engineers (civil, mechanical, electrical, acoustic, etc.), cost consultants, management consultants, contractors, subcontractors, suppliers of building materials, clients, and users are significant players in the construction sector (Elsonoki & Yunus, 2020).

Over the past five decades, there have been a number of developments in the Libyan construction industry. According to Abdalla, Azam and Albattat (2022), Libya's construction industry had a little economic influence in the early 1950s, when the nation had just recently attained independence from Italian colonial authority. During these early years, where one generation may pass on learned construction skills to another, construction was only seen as a social activity. The construction materials efficiently communicated the morality and cultural orientation of the inhabitants (Elsonoki & Yunus, 2020). Following the coup in 1969, as well as during the beginning of the second five-year plan for the Kingdom of Libya (1969–1974), the Libyan construction industry was essential to the development of the country's economic and social structure.

The construction industry in Libya, especially in Tripoli, is vulnerable to potentially hazardous situations that put the safety of all workers and the company at risk. This is due to its critical nature and extensive infrastructure. As a result, during the past five years there have been more accidents, fatalities, and injuries (Algwyad & Talib, 2019). In Libya, the construction industry's reputation may have improved overall. As a

result, many Libyans dislike working in the construction business. The bulk of laborers are brought in from Egypt and Tunisia, two nearby countries (Elsonoki, et al., 2020).

This degradation in Libya's construction sector has been ongoing for some time. Other variables influencing construction safety in Libya, notably in Tripoli, include tight competitive tendering techniques, worker age and experience, a lack of worker training, and management's major focus on production while ignoring safety problems (Elsayah, 2016). Safety is one of the barriers to the development of Libya's construction sector. The issue should be addressed throughout the route in order to improve the building sector's safety performance in Tripoli.

According to Elsonoki and Yunus, (2020), the building industry is unusual in that it may encourage the expansion of other industrial sectors. As a result, the development of the construction sector should not be seen as a distinct entity, but rather as having an impact on national development as a whole. World-class researchers must be employed in order to identify and address the causes of the construction industry's failings in terms of cost and time performance. The reasons and remedies for typical failures seen in the construction sector will be the main topics of this research. The building industry is vital when attempting to encourage economic growth (Alhowaish, 2015). Infrastructure development and job creation are two more areas that can have a significant influence.

The construction sector is vital for achieving modern economic progress since it is crucial for creating new job opportunities and improving current infrastructure (Fei et al, 2021). Due to its significant contribution to the Gross Domestic Product (GDP), this sector plays a vital role in driving economic growth. The construction sector contributes around 4% to the Gross Domestic Product (GDP) of the United States (Bryniuk, 2023). Furthermore, the industry plays a crucial role in job generation, in addition to its significant impact on the economy. Individuals with varying degrees of proficiency may encounter a plethora of employment opportunities within this field. The presence of a varied workforce in the workplace contributes to the promotion of fairness and inclusivity, hence facilitating the advancement of a more equitable and just labour market (Vohra et al, 2015). This holds particularly true in the construction sector. As a result, the building sector holds a significant role.

2.1 Project Management Studies in The Context of Libya Construction Industries

Research on project management in Libya's construction sector uncovers a multitude of interconnected factors that impact the ultimate outcomes. The key subjects addressed in this context encompass the significance of efficient communication, tactics for reducing risk, ecological concerns, and the identification of essential elements for achieving success. When considering Libya's distinctive

socioeconomic and political circumstances, each of these aspects plays a role in enhancing the overall efficiency and effectiveness of construction projects in the country. A wide range of studies have illuminated these issues. In a study conducted by Mohamed Imhmed Abuazoom and his colleagues in 2019, the researchers examined the influence of human resources management HRM practices on the overall quality of building projects in Libya. The long-term ability of a company to maintain a competitive advantage is mostly attributable to Human Resource Management (HRM). In the construction sector of Libya, there is a notable absence of comprehensive research that examines employment practices and industrial relations. Although it is beneficial for creating labour contributions, this fact still holds true. The study utilised a quantitative research approach and focused on individuals in managerial positions as key responders. The data collection adhered to the rules of the simple random sample technique. Statistical data indicates that two crucial human resource management methods, namely information exchange and self-management, have a considerable influence on the quality of project performance. Multiple conflicting theories have arisen from analyses of recent research on HRM and its impact on project quality performance. The concept of implementation is crucial in human resource management techniques as it directly impacts the organization's ability to accomplish its goals and cultivate a cohesive workforce. The primary objective of the study is to improve the quality performance of construction projects by creating an innovative and motivating human resource management framework.

Elkrghli, S., and Almansour, gathered data for a study done in 2024 using a quantitative methodology and questionnaires. The primary motivation for this research was to identify the factors that impact the management of building risks in Benghazi city. 140 questionnaires were analysed to investigate the risks associated with city construction projects and the corresponding management techniques. The study highlighted human resource, technical, resource, financial, legal, managerial, and temporal risks as the most significant factors in construction risk management. These results emphasise the crucial requirement for effective risk management in construction projects, which is essential for achieving sustainability goals. By implementing effective risk management systems, the likelihood of success for construction projects can be significantly increased. This is achieved through the reduction of risks, improvement in performance, and maximisation of efficiency. The results offer a comprehensive understanding of the factors that influence construction risk management in Benghazi city.

Elsonoki, M. M., and Yunus published a study in May 2020 that presented first findings from an evaluation of virtual engineering (VE) techniques and the factors influencing the adoption of VE in Libya's civil construction industry. By employing a quantitative methodology, the study successfully accomplished its study objectives. Before conducting Delphi research, a

pilot test was performed to initiate the process. The purpose of this was to ensure that the participants in the Delphi study have a thorough understanding of the questions they answered. The pilot test had a total of thirty (30) individuals. The pilot study affirms and verifies the structure of the questionnaire that was employed in the Delphi survey to pre-validate it. Throughout the four rounds of the Delphi poll, which involved 31 participants, only minor adjustments were made. Subsequently, the data was examined with SPSS version 20. The Cronbach Alpha can range from 0.69 to 0.92 for the study factors. Based on the outcomes of the reliability test, it seems to fall within the allowed range. The study determined the appropriate size of the primary survey sample by employing Slovin's approach. The researchers determined that a minimum of 390 individuals were required to complete the survey in order to conduct the analysis. This was achieved using a traditional random sampling technique.

METHOD

This study employs a quantitative methodology to investigate the impact of firm size, planning, implementation, monitoring, and evaluation and project Clouser on project performance.

3.1 SAMPLE OF THE STUDY

The construction projects in Tripoli will be the subject of this investigation. Therefore, the entire 49 companies cannot be chosen in this study that is why the researcher need to use sample design to choose from the population. This study uses probability sampling, particularly simple random sampling, in which all project managers, project supervisors, and contractors from 49 licensed construction firms in Tripoli, Libya, are included. As the study's respondents, the project managers, project supervisors, and contractors from each organization will be provided. 339 questionnaires will be randomly distributed across construction businesses in order to get the data.

3.2 Reliability of the Instrument

To ensure reliability, this study will employ the internal consistency method. Cronbach's alpha coefficient must be calculated to ascertain the degree of correlation between the various items under investigation. Sekaran (2016) argued that reliability coefficients closer to 1.0 are preferable, but those less than 0.60 are considered poor; thus, coefficients in the 0.70 range are acceptable, while those greater than 0.80 are desirable. In this study, a coefficient greater than or equal to 0.7 is considered sufficient (Sreevidya & Sunitha, 2011). The table 3.7 measure the reliability of pilot test of each construct in this study. The result is in line with previous literature on reliability as most of the result is between the 0,7 to 0.8. Project closure has the value of 0.874 which is the highest range while project implementation has 0.713 range of lowest value among the variables.

Table. 1 Reliability

variables	items
Project Planning	0.884

Project implementation	0.713
Monitoring and controlling	0.771
Project closure	0.874
Company Size	0.783
Project performance	0.746

Testing the Measurement Model, Outer Model, Using the PLS Approach

The partial least squares structural equation modelling (PLS-SEM) technique was used to assess measurement model or the outer model before testing the hypotheses. Similarly, Deal (2006); Hair et al. (2012); and Henseler et al. (2009) suggested two methods (measurement model and the structural model), which were recommended by Gerbing (1988). Therefore, this study tested using the measurement model and the structural model.

The outer model is a basic link between the latent constructs and their indicators (Anderson and Gerbing, 1988; Tabachnick and Fidell, 2007). As indicated by Henseler et al. (2009), the estimation of the model should be evaluated through the convergent validity and

discriminant validity based on the average variance extracted (AVE), and composite reliability.

The indicator reliability was evaluated using the outer loadings and cross-loadings. These were evaluated in terms of certain limits; for instance, Fornell & Larcker (1981); Henseler et al. (2009); Hair et al. (2010); and Hair et al. (2014) indicated that items loading at less than 0.5 could be removed. The use of the outer model is to verify whether the items are loading and measure the intended concept or construct. Hence, the items can measure the validity and reliability of each construct.

The construct is used to measure the indicators for such as project closure, the loading of each item on their indicators, the loading is higher than the suggestion of Hair et al. (2010) who recommended that the loading of each item should be above 0.5. Meanwhile, the minimum loading in this study is item under the indicator of customer knowledge, while the maximum loading is under the indicator of legal and regulations. Below figure 4.2 shows the link between each construct or variables as connection they were connected to the dependent variables project performance.

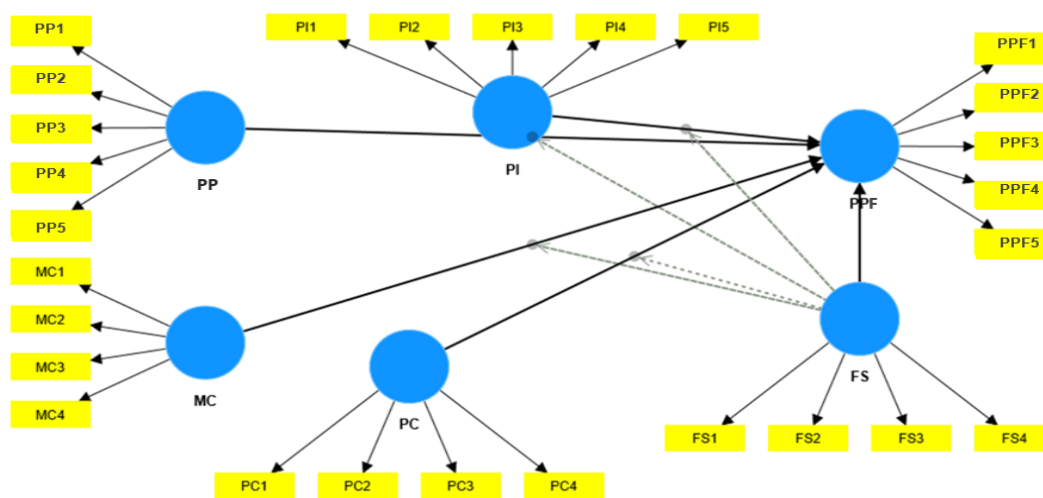


Figure 4.1

The Link Between Each Construct or Variables as Connection They Were Connected to The Dependent Variables Project Performance

Figure 4.2 illustrates the frameworks of this study and shows how each items links to each indicator. Therefore, items are used to measure each 1ndicators and it must leading higher than 0.5 as mention in previous section. Meanwhile, the below Figure 4.2 revealed measurement of each item towards the indicators.

The illustrate how items connect to each indicator which is called outer loading, the outer loading explain how items on each construct measure above the recommendation of Hair et al. (2010). Therefore, the minimum loading of each item is above 0.5 suggested from previous literature. In order to make indicator to make the recommendation by hair et al. (2010) for AVE, Cronbach Alpha and composite reliability some items were deleted in order to increase the indicators value or loading high.

4.13 Indicator Reliability

In this study, PLS-SEM was utilized to evaluate each indicator or item on each construct in order to measure

the outer loading of each item that was linked together to develop a construct or indicator. In addition, different studies have recommended a variety of scales to measure the loading of the items, cross-loadings, composite reliability and AVE (Ringle et al., 2005). The range for each item should be more than 0.70 (Hair et al., 2011; Henseler et al., 2009), while Hulland (1999) stated that the outer loading or any item that is less than 0.5 should be removed from the measurement model. Essentially, Hair et al. (2014) recommended that any item with an outer loading below 0.5 should only be deleted from the measurement in PLS-SEM if the composite reliability or the average variance extracted is above the suggested threshold value.

4.14 Internal Consistency Reliability

Internal consistency reliability is the form of reliability used to evaluate the consistency of the results across items in the same test. It determines whether the items measuring a construct are similar in their scores (Hair et al., 2014; Hair et al., 2010; Sekaran & Bougie, 2010; Litwin, 1995). Furthermore, the internal consistency reliability is evaluated in terms of the Cronbach Alpha score (Cronbach, 1951). The estimation here depends on the inter-correlation of the items, whereby every one of the items is expected to have the same external loadings (Hair et al., 2014). Moreover, the primary purpose of PLS-SEM is that of an indicator of the reliability of an individual item. In this manner, because of the drawbacks of the Cronbach Alpha score, a more robust

measure for surveying the internal consistency reliability, referred to as the composite reliability, is proposed; as examined in Starkweather (2012).

Additionally, for the criteria for the appraisal of the internal consistency reliability utilizing composite reliability, and in light of Nunnally and Bernstein (1994), Hair et al. (2011) recommended that the composite reliability should be more than 0.70, or a range of 0.60-0.70 is considered satisfactory in exploratory research. The quality of the internal consistency reliability is deemed lacking when the estimations of composite reliability are under 0.60, while values over 0.90 indicate an invalid measure, as this shows the items are measuring a similar idea (Hair et al., 2014).

Based on the composite reliability for all the latent constructs calculated using the smartPLS standard algorithm, the outcome demonstrated that all the latent constructs have met and surpassed the minimum estimation of 0.70 (Hair et al., 2011; Henseler et al., 2009). Additionally, the composite reliability is between 0 and 1; a bigger loading signifies the reliability of a higher level (Hair et al., 2014; Hayduk & Littvay, 2012; Rossiter, 2002; Drolet & Morrison, 2001). Table 4.12 shows the results of the internal consistency reliability from the smartPLS.

Table 4.1 Indicator loading and internal consistency reliability

Constructs	Items	Loading	Composite Reliability	Cronbach's Alpha
Firm Sizes	FS1	0.885	0.873	0.862
	FS2	0.830		
	FS3	0.827		
	FS4	0.817		
Monitoring and controlling	MC1	0.892	0.971	0.937
	MC2	0.938		
	MC3	0.911		
	MC4	0.923		
Project Closure	PC1	0.711	0.806	0.771
	PC2	0.617		
	PC3	0.858		
	PC4	0.863		
Project Implementation	PI1	0.766	0.847	0.830
	PI2	0.825		
	PI3	0.773		
	PI4	0.710		
	PI5	0.770		
Project Planning	PP1	0.796	0.882	0.867
	PP2	0.775		
	PP3	0.776		

Project Performance	PP4	0.871	0.894	0.887
	PP5	0.816		
	PPF1	0.842		
	PPF2	0.838		
	PPF3	0.842		
	PPF4	0.853		
	PPF5	0.772		

Table 4.12 demonstrates the loading and the results for the Cronbach's Alpha and composite reliability. It shows that the result is in line with Hair et al. (2014) being between 0 and 1. The minimum value for composite reliability is project closure with the value of 0.806, the high value range for the composite reliability is monitoring and controlling with the value of 0.971. Similarly, Cronbach's Alpha in this study is above the satisfactory level, monitoring and controlling with 0.937 which is good for running or measure the construct, and the minimum is for project closure. Therefore, this result in this study is considered good and reliable.

4.15 Content Validity

The measurement of content validity is the degree to which the items produced to measure a construct is capable of measuring the concept they are designed to measure (Hair *et al.*, 2010). Specifically stating, the items that were designed to measure a construct should present a higher loading on their construct compared to other constructs.

Bollen (2010) defined content validity as a concept to measure the idea or item and the analyst judges whether the measure fully represents the concept. Hair et al. (2010) said that the content validity of the measure is the point to which the items generated to measure a construct can appropriately assess the concept they were projected to measure. More particularly, all the items identified to measure a construct should load higher on their various constructs than on the alternative constructs. The outcomes in Table 4.13 indicated the content validity of the measures used, as illustrated in two ways. Foremost, the items show high loading on their respective constructs when compared to other constructs. Furthermore, the item loadings were significantly loading on their respective constructs confirming the content validity of the criteria used in the subject field; as illustrated in Table 4.13 (Chow & Chan, 2008).

Table 4.2 Cross Loading

Firm sizes	0.885	0.162	0.156	0.166	0.109	0.237
	0.830	0.140	0.120	0.153	0.158	0.227
	0.827	0.128	0.022	0.225	0.119	0.159
	0.817	0.123	0.177	0.205	0.141	0.235
	0.189	0.892	0.048	0.264	0.060	0.240
Monitoring and controlling	0.139	0.938	0.031	0.256	0.014	0.179
	0.135	0.911	0.113	0.340	0.011	0.164
	0.123	0.923	0.071	0.286	-0.001	0.148
	0.167	0.028	0.711	0.301	0.281	0.223
Project Closure	0.038	0.166	0.617	0.140	0.373	0.120
	0.103	0.147	0.858	0.325	0.364	0.250
	0.131	0.091	0.863	0.355	0.362	0.250
	0.287	0.384	0.282	0.766	0.204	0.310
Project Implementation	0.139	0.210	0.256	0.825	0.237	0.285
	0.169	0.229	0.295	0.773	0.209	0.205
	0.074	0.171	0.318	0.710	0.167	0.191
	0.127	0.148	0.348	0.770	0.214	0.226
Project Planning	0.144	-0.134	0.370	0.182	0.796	0.232
	0.145	0.055	0.326	0.231	0.775	0.200
	0.029	-0.141	0.279	0.144	0.776	0.226
	0.044	-0.049	0.413	0.186	0.871	0.239

	0.240	0.158	0.363	0.315	0.816	0.311
Project						
Performance	0.227	0.183	0.293	0.326	0.285	0.842
	0.219	0.184	0.248	0.329	0.269	0.838
	0.213	0.155	0.236	0.171	0.261	0.842
	0.230	0.177	0.233	0.237	0.236	0.853
	0.190	0.155	0.154	0.270	0.210	0.772

Table 4.13 explains how items on the intended construct loaded higher than other items on other constructs in the same row. For instance, the construct of firm size, all the items from FS1 to FS5 most loaded higher (0.5) and the intended construct and items most loading high than other items in the same row. This shows that there is a difference between the intended items (FS) and other items (constructs) in the same line of firm size. Therefore, the content validity of this study can be confirmed based on the results in table 4.13, which reveal a good result.

4.16 Convergent Validity

The convergent validity is referred to as the level to which a set of variables converge in their measurement of a specific concept (Hair *et al.*, 2010). In The convergent validity can be confirmed when there is a high degree of correlation between two different sources responding to the same measure (Sekaran & Bougie, 2014). The convergent validity is determined by the grade to which a set of variables converges in measuring a particular concept (Hair *et al.*, 2010). Thus, it is important that the items share more variance with the respective measure than other variables in a particular

model. To assess the convergent validity, examination of the factor loadings and the average variance extracted (AVE) is needed. All these were used simultaneously as suggested by Hair *et al.* (2010). In doing so, the item loadings were examined, and all the items have loadings of more than 0.4, which is an acceptable level according to the multivariate analysis literature (Hair *et al.*, 2010). In addition, Table 4.14 indicates that all the factor loadings were significant at the 0.01 level of significance. The intention of the AVE is to assess the amount of variance of the index, which is accounted for by the construct relative to the total due to the measurement error. If the AVE values are at least 0.5, it suggests that these sets of items have adequate convergence in measuring the particular construct (Barclay, Higgins, & Thompson, 1995; Bořow-Thies & Albers, 2010). Similarly, Hair *et al.* (2011) recommended that any item below 0.4 should be deleted from the other item on the same construct. For this survey, the average variance extracted (AVE) values ranged between 0.5 and 0.7, thus exceeding the 0.5 value recommended by Hair *et al.* (2013). This indicates the full degree of the construct validity of the criteria used.

Table 4.3 Convergent validity

Constructs	Items	Loading	Average Variance Extracted (AVE)
Firm Sizes	FS1	0.885	0.706
	FS2	0.830	
	FS3	0.827	
	FS4	0.817	
	MC1	0.892	
Monitoring And control	MC2	0.938	0.839
	MC3	0.911	
	MC4	0.923	
	PC1	0.711	
	PC2	0.617	
Project Closure	PC3	0.858	0.592
	PC4	0.863	
	PI1	0.766	
	PI2	0.825	
	PI3	0.773	
Project Implementation	PI4	0.710	0.592
	PI5	0.770	
	PP1	0.796	
	PP2	0.775	
	PP3	0.776	
Project Planning	PP4	0.871	0.652
	PP5	0.816	

Project Performance	PPF1	0.842	0.689
	PPF2	0.838	
	PPF3	0.842	
	PPF4	0.853	
	PPF5	0.772	

The results in Table 4.14 reveal that all the constructs in this study have a loading higher than 0.5, which is the baseline for the AVE scale or value recommended by Hair et al. (2013). The results for the constructs in Table 4.14 show that Project implementation and project closure is the lowest with the value of 0.592, while Project monitoring and controlling has the highest figure with 0.839. therefore, the result of this study in line with the previous study on value that determine the convergent validity, as the construct is measure or show the value is loaded higher to explained this study.

4.17 Discriminant Validity of the Measures

The discriminant validity of the measures indicates the degree to which one construct is differentiated from the others, which shows that the item makes use of different non-overlapping constructs. To support the construct validity of the outer model, it was necessary to establish

the discriminant validity. Therefore, if the discriminant validity of a measure is established, it means that the shared variance between each construct and its measures should be greater than the variance shared among distinct constructs (Compeau, Higgins, & Huff, 1999).

This work used the method of Fornell and Larcker (1981) to confirm the discriminant validity of the measures. As illustrated in Table 4.14, the square roots of the average variance extracted (AVE) for all the constructs were placed on the diagonal elements of the correlation matrix. As the diagonal elements were higher than the other elements of the row and column in which they are located, it confirms the discriminant validity of the outer model. Having established the construct validity of the outer model, it is presumed that regarding the hypotheses, the obtained results should be valid and reliable.

Table 4.4 Discriminant Validity

CONSTRUCTS	FS	MC	PC	PI	PP	PPF
FS	0.840					
MC	0.165	0.916				
PC	0.151	0.069	0.769			
PI	0.219	0.310	0.383	0.770		
PP	0.158	0.015	0.436	0.270	0.808	
PPF	0.261	0.207	0.285	0.326	0.306	0.830

Table 4.15 describes how the intended construct (in bold figures) is loading higher than other constructs on the same column and row. For instance, the construct of firm size loaded or measure with the value of 0.840 and there is no any other construct that loaded higher than its own construct on the same column. Similarly, following the construct of monitoring and controlling is in the same roll with the firm size is with the value of 0.165 with on the monitoring and controlling is 0.916 and there is no any construct that loaded higher than monitoring and controlling on the same Column.

Therefore, there is a significant correlation among the constructs of this study.

4.18 Assessment of the Inner Model and Hypotheses Testing Procedures

After the goodness of the outer model was confirmed, the next step was to test the hypothesized relationships among the constructs. Using PLS-SEM 4.3.4 the hypothesized model was tested by running the PLS Algorithm. The path coefficients were then generated, as illustrated in Figure 4.3 and Table 4.16

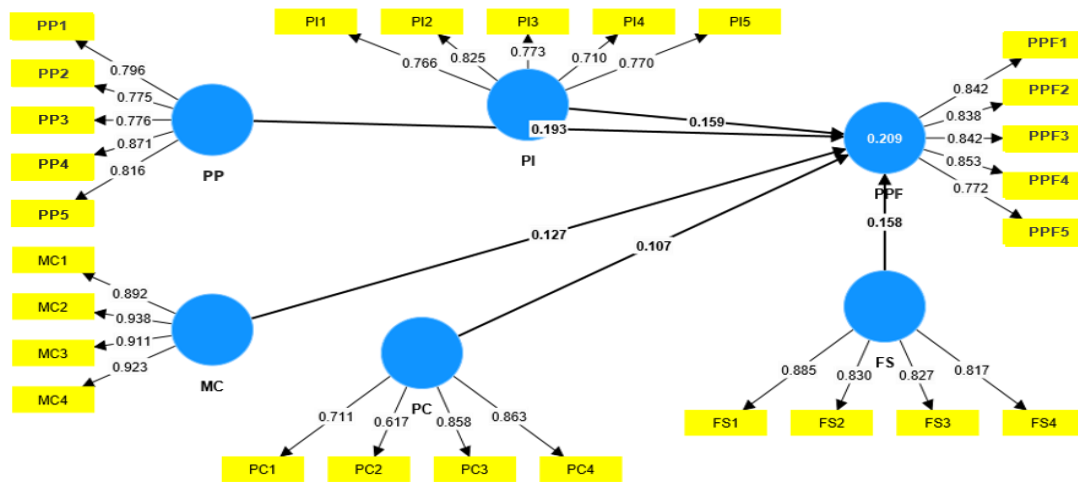


Figure 4.2 The Path Coefficients Were Then Generated

The figure shows how each item on each construct loaded with the suggest range value to determine the or valid the items and construct. The figure illustrates the items and constructs were loading and measure its own intended to measure with good result.

4.18.1 Hypothesis Test

There are nine hypotheses in this study; five (5) direct effect and four (4) moderating hypotheses as stated in the literature review chapter. Statistical t-values that are substantially different from 0 is said to be almost always statistically significant, however, it is largely depending on the degree of freedom, confidence interval and directionality of hypothesis, thus p. value is used to ascertain if the paths are significant (Hair *et al.*, 2014). In order to obtain the statistical t-values and the standard

error, the PLS bootstrapping resampling (Chin, 2010) was run with 500 bootstrapping samples. The bootstrapping sample is considered adequate, going by Henseler (2012) study. Similarly, Simar and Wilson (2011) set his bootstrapping samples as 500.

The below table 4.16 shows the result from direct measurement from the result analysis software.

Table 4.5 Result of hypothesis testing

Constructs	Beta (β)	T-value	P-value	Decision
Project Planning -> Project performance	0.139	2.180	0.029	Support
Monitoring and controlling -> Project performance	0.126	2.642	0.008	Support
Project implementation -> Project performance	0.205	3.170	0.002	Support
project closure -> Project performance	0.054	0.825	0.409	Not Support
Firm sizes -> Project performance	0.161	3.078	0.002	Support

*.P<0.1; **.P<0.5; ***.P<0.01

Table 4.16 presents the hypothesis results from PLS-SEM, which shows that the entire variables are supported in this study. Hence, the dependent variable is project closure, which can be predicted by Project implementation (PI), Project performance (PPF), Project Planning (PP), Monitoring and controlling (MC), Project closure (PC) company size (CS). The b value shows the relationship between the independent variables and the dependent variable and how they can influence or explain the dependent variable to support the current study. Therefore, the t-test associated with the p-value is undertaken in order to determine the result.

H₁, which refers to planning is supported (β = 0.139, t= 2.180, p<0.029) because the result shows significant relationship between project planning and project performance. Furthermore, project planning has a positive relationship with project performance.

H₂, Monitoring and controlling is supported and has a significant relationship at the 0.01 level of significance (β = 0.126, t= 2.642, p<0.08), indicating that there is a positive relationship between Monitoring and controlling with project performance.

H₃, Project implementation, the hypothesis is also supported and has a significant relationship at the 0.01

level of significance ($\beta = 0.205$, $t = 3.170$, $p < 0.02$) thereby indicating that there is a positive relationship between Project implementation and project performance.

H4, Project closure supports project performance, whilst Project closure has no significant relationship at the 0.05 level of significance ($\beta = 0.054$, $t = 0.825$, $p < 0.409$) thereby indicating that there is a no relationship between Project closure and project performance.

Lastly, H5, Firm sizes is also supported and has a significant relationship at the 0.01 level of significance ($\beta = 0.160$, $t = 3.553$, $p < 0.00$), and thus, indicates a positive relationship between Firm sizes and project performance.

4.18.2 Result of Moderating Hypotheses

As explained in the literature review section, according to Baron and Kenny (1986), a moderating variable is an

interacting term which is said to emerge when the relationship between independent and dependent variables is surprisingly weak or inconsistent relationship or no relationship at all, thus the moderating variable is introduced to reduce or strengthen the relationship. Similarly, according to Henseler and Fassott (2016), “moderating effects are evoked by variables whose variation influences the strength or the direction of a relationship between an exogenous and an endogenous variable” (p. 713). As cited in Henseler and Chin (2010) there are basically four (4) approaches to analysing moderation effect in PLS SEM; they are product indicator approach (Chin et al., 2003), a 2-stage approach (Chin et al., 2003; Henseler & Fassott, 2010), and an orthogonalizing approach (Little, Bovaird, & Widaman, 2006). The below figure 4.4 shows the significance moderating effect of firm size to the other constructs.

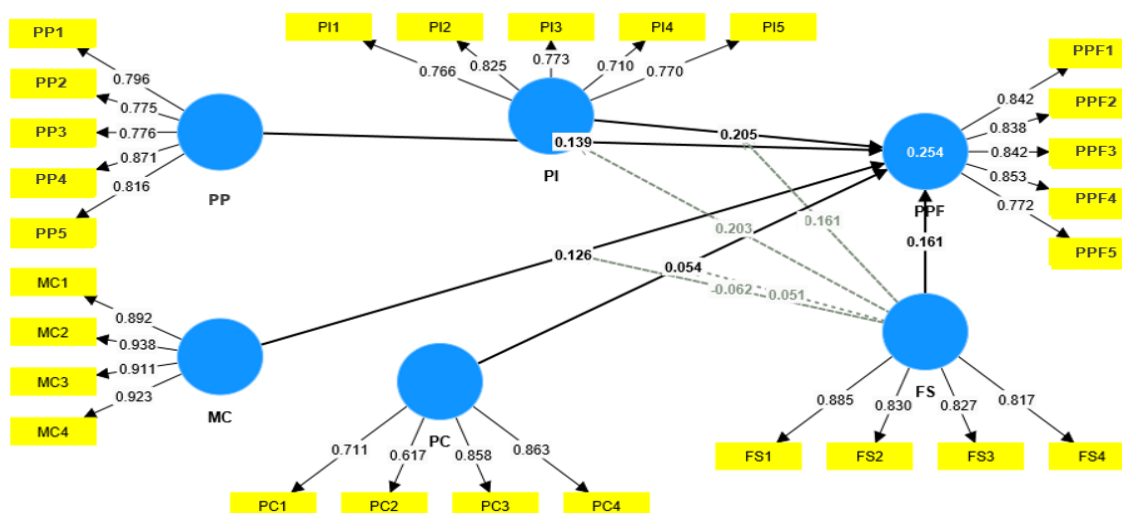


Figure 4.3

Table 4.6 Result of Moderating Hypotheses

Hypothesis	Path	Beta (O)	T-value	P-value	Decision
H ₆	Firm sizes x Project Planning -> Project performance	0.203	2.819	0.005	Support
H ₇	Firm sizes x Monitoring and controlling -> Project performance	-0.062	1.118	0.264	Not support
H ₈	Firm sizes x Project implementation -> Project performance	0.161	2.173	0.030	Support
H ₉	Firm sizes x project closure -> Project performance	0.051	0.732	0.464	Not support

Table 4.17 demonstrates the moderating result of this study using the firm size to test the relationship between the latent and endogenous variables. The results show that the P-values were calculated as demonstrated above. However, as illustrated in Henseler and Fassott (2010) and Hair et al. (2014), the interacting terms for all the moderating paths were created in the PLS structural model (Figure 4.2). As shown in Table 4.17, out of the four (4) moderating hypotheses, two (2) are

supported, while the other half did not show any evidence of moderating effect.

H₆, Project Planning ($\beta = 0.203$, $t = 2.819$, $p < 0.005$), the result illustrates the significance interconnection between the firm size with the strength relationship with Project Planning and Project performance.

With regards to H7 Monitoring and controlling supports Project performance, and also has no significant effect on the firm size ($\beta = -0.062$, $t = 1.118$, $p < 0.264$). In addition, there is no strength interaction and correlation between Monitoring and controlling and Project performance.

Unlike others, H8 Project implementation, is supported and has significant effect on the firm size interaction and association between Project implementation and Project performance ($\beta = 0.161$, $t = 2.173$, $p < 0.030$). Similarly, H9, Project closure, is also supported and has a significant effect on the company size ($\beta = 0.051$, $t = 0.732$, $p < 0.464$) and there is also no interaction of firm size with no strength between Project closure and Project performance.

DISCUSSION

The direct hypotheses result shows that there are nine hypotheses in this study; five (5) direct effect which four out of five variables were supported in this study while only one variable is not supported which project closure. Meanwhile, four (4) moderating hypotheses result testing shows out of the four (4) moderating hypotheses, two (2) are supported, while the other half did not show any evidence of moderating effect. The conclusion of this study is that the results of this study support previous literature, such as Hair et al. (2010) in that the AVE (Table 5.12) in this study is above 0.5 (0.5 to 0.8) while the CR is above 0.7 (0.8 to 0.9). Similarly, Cohen (1988) estimated that effect sizes of 0.02 = Weak, 0.15 = Moderate and 0.35 = Strong; hence, the effect size results of this study show that three constructs were weak, one construct was moderate, and two constructs had no effect. Additionally, according to Fornell and Cha (1994) the predictive relevant value should be > 0 ; the predictive relevance of this study is 0.2 and hence is acceptable. However, 5.18 demonstrates the hypotheses in that five direct relationships are supported; similarly, for indirect relationships, as 2 moderators is supported and 3 moderators are rejected.

The overall aim of this study is to apply and make extension to the field of project management practice on project life circle (project planning, project implementation, monitoring and controlling, and project closure). First, it is aimed to add on literature on project management by using firm size as moderator to this study, the existing ones in the literature and empirically validate the extension. Secondly, it is aimed to introduce a moderating variable to moderate the relationship among the variable in the project life circle on project management. Hypothesis for the relationships in the model was formulated, tested and findings were presented and discussed. Therefore, having discussed the findings of the study in the previous sections, there are implications of these findings to the body of knowledge and practice.

These implications and contributions are hereby discussed in the following section Furthermore,

discussions of the flaws in the methodology of previous literature were presented, thus the current study pay attention to those methodological flaws and improved them. These improvements therefore pose some implications, thus becomes methodological contributions. Subsequently, implications arising from the theoretical and methodological contributions generate practical implications and contributions, thus they are presented and discussed.

5.5.1 Theoretical Implications and Contributions

The theoretical contribution of this study is that the researcher combined the resource-based theory, Construction Management Theory (CMT) and Psychological Contract theory to provide a better understanding and explanation of project performance in construction companies, and to overcome the shortcoming in the resource-based theory, Construction Management Theory (CMT) and Psychological Contract theory, which are ignoring firm size as a means to determine the project performance. However, previous study neglected to use firm size in the context of project performance in construction companies. Therefore, this study used Construction Management Theory (CMT) and Psychological Contract theory to support and explain the project management, project implementation, monitoring and controlling, project closure. While the resource-based theory was used to explain the project performance in this context.

The outcome of this study has some theoretical implications. First of all, although the resource-based theory, Construction Management Theory (CMT) and Psychological Contract theory have been widely studied across contexts, both at individual (customer) and organizational (contractor) levels, however, there is no coherent attempt to investigate the phenomena in the perspectives of construction company in the area of project management with concern for project life circle or project phase. Therefore, this study implies that the project management theories have fall short of theorizing the impact of firm size on the project performance in construction companies of Libya. Secondly, the existing literature views project management in isolation, although there are areas of study which are interrelated with. Thus, the existing literature was fragmented. Consequently, the current study viewed firm size as a process of change project performance in the project life circle, especially in the context of construction companies.

From the managerial perspective, this study not only contributes to the theoretical perspective. It also contributes to the empirical knowledge to increase strength and increase the significance of firm size to determine the project performance. Meanwhile, the existence of the firm size to drive CEOs, managers and directors to understand the ability of project phases towards the project performance and the belief that understanding the importance of firm size can increase and strong the significance of project performance in the

construction companies, delay of project will be ease to understand problem, lack of budget estimation will be gone from the construction company. This study proved that these factors influence project performance in the context of Libya. Therefore, it proves and supports the notion that the resource-based view be generalized, especially in the Libya context.

This study has mentioned the perceived gap in the project performance literature and responds to the call to support significance importance of firm size and its effect on project performance, which lacks empirical research and the need to understand its factors and their influence on firm size and project performance. This study tested the validity and reliability of the project performance scale, which was adopted from the original theory or the studies that used the original theory in their studies.

This study is one of the few studies that investigate firm size to determine the construction company performance, particularly in Libya, as limited studies have focused on or investigated project performance in the context of project management. This study contributes to the body of knowledge on project performance in construct companies. This study combines theories, which have not been used together in previous studies. Similarly, it uses the moderating effect of the firm size as moderators are limited in previous studies. This study is among the few empirical studies that examine the firm size moderating the project planning, project implementation, monitoring and controlling, project closure.

5.5.2 Practical implications

Based on the results of the study, this current research has contributed to several practical implications in relation to project performance in the context of the construction companies in Libya. The findings of this study are important to policymakers, the ministry of works, agencies in charge of construction and project regulation, and financial institutions in terms of designing and making policies on project in construction companies in Libya.

The results of this study reveal that the project management, project implementation, monitoring and controlling project closure have significance relationship to strength project performance. Therefore, the findings will help the construction companies (CEO, directors, managers, and staff) in applying the project performance measures to understand the importance of firm size in construction companies

Also, the findings help the construction companies to strength and well as provide ways to improve the performance of the company efforts, both internally and externally, by developing a strong strategy and principles concerning project performance based on the results of this study.

5.5.3 Contribution to knowledge

The main contribution of this research is in enhancing the understanding of the relationships between integrated project management, project implementation, monitoring and controlling, project closure and project performance. This research has made assumptions that integrated firm size can enhance team collaboration; team collaboration can enhance project management, project implementation, monitoring and controlling, project closure can consequently enhance project performance. It has tested these assumptions and elaborated the fundamental characteristics of project management, project implementation, monitoring and controlling, project closure and firm size to explain their effect on project performance.

In addition, elaboration of the basic features of project management, project implementation, monitoring and controlling, project closure and project performance provided the author with a conceptual framework that illustrates how various features could lead to the enhancement of project performance. The research conducted also validated the “strength of influence” of these characteristics and answered “how” these features could lead to project phases and project performance. It captures the subjective view of many experienced project managers and provides a conceptual framework that can be used by project managers to deploy the various key characteristics identified in the research to enhance their relationship between project management, project implementation, monitoring and controlling, project closure leading to project performance.

5.5.4 Methodological Implications and Contributions

The measurement model modes were not specified for the two constructs that made the extension of project performance and firm size in construction companied to understand the strong or weak relationship with project planning, project implementation monitoring and controlling in the current study. Hence the current study specified the measurement model mode of the indicators, based on the guidelines provided in Hair et al. (2014). The 5 items each for firm size was measured reflectively based on their wordings and direction of causality etc.

Thirdly, although PLS-SEM has received remarkable application in the recent past, especially in the information system research, only a few of its application estimated some advanced level PLS analysis such as effect sizes (f^2), predictive relevance (Q^2) and effect size of the predictive relevance (q^2). Calculating these further enhance the understanding of the most important exogenous variable in explaining the R^2 of the endogenous latent variable in a given model and the predictive capability of the model. Furthermore, as the popular maxim articulates; a picture says a thousand words, a graphical representation of the moderation

plots was provided in the current study. This further enriched understanding of the moderation.

5.6 Limitations of the study

As it is the practice in scientific research, particularly project management research, there might be some theoretical and/or methodological issues that might enhance the reliability and validity of the research findings, but have not been fully taken care of, often because of some factors beyond the control of the researcher. These limitations are hereby enumerated and discussed.

First of all, this study focused on project performance alone, thereby neglecting process and measuring the performance, unlike in other theories on performance measure on project management. However, this is because the context of the study is lagging behind in terms of project life cycle or project phase with firm size on project performance. Therefore, the current study is constrained to study the project performance and firm size. However, the current study collected data in a cross-sectional manner.

lastly, this implies that there might be another variable which can add the variance explained of the endogenous latent variable in the model. Furthermore, the current study examined only the direct relationships (and moderating) of independent variables and project performance. Finally, the extended of firm size as moderator proposed in this study to check the impact or effect of large and small size of construction companies in the context of Libya.

5.7 Recommendation for Future Research

The limitation of the current study was highlighted and discussed in the previous section. Therefore, these limitations offer avenues for future researches. Hence this section discussed these avenues and offer recommendations for future researchers to explore these avenues.

The research is able to conceptualize a tool for practically assessing construction project performance. Further research would be carried out to subsequently improve upon the model to make it a versatile and robust tool for assessing the performance of construction projects. The need for future exploration in this area of research is clear as the project performance model is wide in scope due to mental model built into the equation and thus, improved understanding of construction system would create need for improving mental models and thus, improving the performance model.

As the government is making effort to ensure significant diffusion of project performance through the planning, implementation, monitoring and controlling, closure with the firm size investigations such as the current

study construction companies might significantly grow by following the clear process to achieve the project performance. Hence researchers can examine project performance through the financial performance in one study. For that reason, this study recommends future studies to collect data in longitudinal approach. This might enhance understanding of the phenomena, by examining whether project finance, government policy on construction companies truly leads in project management.

Considering the inability of the current study to gather large sample size due to logistics constraints, future studies should limit such constraints by obtaining substantial funding for their research. This increases the possibility of collecting large sample size that can sufficiently represent the population. Furthermore, if situation warrant access to comprehensive sampling frame, future studies should adopt more generalizable probability sampling technique such as simple random sampling, systematic, stratified random sampling techniques etc. This will enhance the generalizability of their findings. On the other hand, the extended model could be tested in another context; using covariance based structural equation modelling technique (CB-SEM). Although this might appear as replication, however it is important to test the model across context, using different estimation approaches. As the hallmark of scientific research assumed, the application of the extended model in similar context will further substantiate its replicability.

Similarly, in order to maintain parsimonious model this study might have ignored some important predictors of project performance. For that reason, this study recommends future researchers to expand the horizon of the current understanding of phenomena. The expansion could be in form of theoretically and contextually-driven factors that improves on what is currently known and understood.

this study adopted the quantitative method of research and depended on questionnaires as the only instrument for the data collection process. The respondents may not have had time to answer the questions properly in order to measure the variables under study. Therefore, future research may combine either quantitative and qualitative methods or use focus groups to investigate firm size and project performance in the context of Libya construction.

Finally, the moderating firm size can only moderate project management and project implementation with the interaction of project performance. Therefore, future studies can investigate and consider other moderating variables to strengthen the relationship and interaction.

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