

# Analysis of the Factors Affecting Syrian Construction Companies' Performance

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The goal of this study is to present the preliminary results of the reliability of the measurement scales used to gather data that investigates the effect of organizational factors on the performance of Syrian construction companies with “Institutional Pressures” as the potential moderator of the relationship between these factors and performance outcomes. The measurement scales have been adapted and subjected to content validity testing with academic and industry experts. This present paper reports the reliability of the measurement scales used for data collection from a sample of 20 building experts in Syrian construction organizations using a seventy-nine-item questionnaire instrument. The reliability of the measurement scales was tested by determining the internal consistency. This was done by computing the average inter-item correlations utilizing Cronbach alpha. The findings of the reliability test show Cronbach’s alpha values above the generally accepted threshold of 0.7. Hence, these findings provide the researcher with an insight into the reliability of the measurement scales of the construction firm's performance measures along with the specific organizational factors that may affect performance.

**Key words:** *Syrian Construction Companies, Performance Measures, Organizational Factors, Institutional Pressures, Reliability Test, Cronbach alpha.*

## Introduction

Extremely competitive forces within the construction industry are forcing administrators to enhance their firm’s performance constantly in order to withstand and survive their competition. This has turned into an international pursuit to keep pace with several countries and face the growing demands of socio-economic growth (Ofori, 2000; Beatham et al, 2004).



Construction firms have faced several challenges when seeking a suitable mechanism to deliver building projects (Datta, 2000). Furthermore, many such projects have been unsuccessful. This tendency is rising and the business environment has become chaotic, especially in developing countries (Luu et al, 2008). However, it is advisable that construction firms measure their performance in order to benchmark their standings relative to their rivals so that the applicable steps can be taken to reach their objectives (Luu et al, 2008). Moreover, it is believed that advancement can only be evaluated by measurement (Marr, 2019). The outcome of quantifying performance in these aspects will be used to develop strategies for the organization (Sousa and Aspinwall, 2010).

The hard part of measuring an organization's performance is not only in knowledge and practical experience but the proper use of instruments and methods in receiving the right data regarding performance, especially when what has to be measured is dynamic (Hubbard, 2009). Hence, construction organizations must be careful of most sources and data that might be utilized to measure their overall performance.

Although the performance outcomes right after measurement present benefits to those who implement it for functions such as evaluation, control, and the advancement of-business procedures, the factors that affect this performance are still not studied well enough on an organizational level (Wongrassamee et al, 2003). These factors can be utilized to place an organization's performance at the medium or high stage. Achievement of the peak level of performance is contingent upon the motives of execution (Sousa and Aspinwall, 2010).

As far as Syria is concerned, to date, few efforts have been made to identify indicators that could be utilized to measure the performance of construction projects. Indeed, no insight has been offered to the overall performance of these firms (Maya et al, 2015). To bridge this gap, it is necessary to examine the dimensions that can be used to measure the performance of an organization and examine the effect of the factors on that performance.

In preparation for a major survey, A pilot study is critical and is needed to evaluate the feasibility of the proposed data analysis techniques, as well as to test the reliability and improve the internal validity of the questionnaire items (Farm 2010; MacLean, 2013).

Sekaran and Bougie (2016) defined reliability as an indication of the stability and consistency with which the instrument measures the concept and helps to access the goodness of a measure. This study, therefore, reports the reliability results of the survey instrument used in the pilot study. This objective has been met by testing the internal consistency of the measurement scales through their Cronbach alpha values.

## Literature Review

Over the last few decades, several construction companies have shown an imperative for identifying their performance perspectives that represent a comprehensive coverage of all pertinent aspects of their business model. These perspectives highlight indicators that have been defined by the National Institute for Standards and Technology (NIST) as, "numerical information used to quantify the input, output and performance dimensions of processes, products, programs, projects, services and the overall outcomes of an organization," (NIST, 2019). Some authors have proposed the use of the original perspectives of Balanced Score Card (BSC) to evaluate the performance of construction companies (Yu et al, 2007). However, Lueg (2015) suggests that the original BSC ignores developments in industry-specific, social, and natural environments. Accordingly, other authors have added relevant perspectives to the original perspectives of the BSC to evaluate the performance of construction organizations (Ali et al, 2013; Jin et al, 2013) or they have replaced existing perspectives of the original BSC with new ones (Ozorhon et al, 2011).

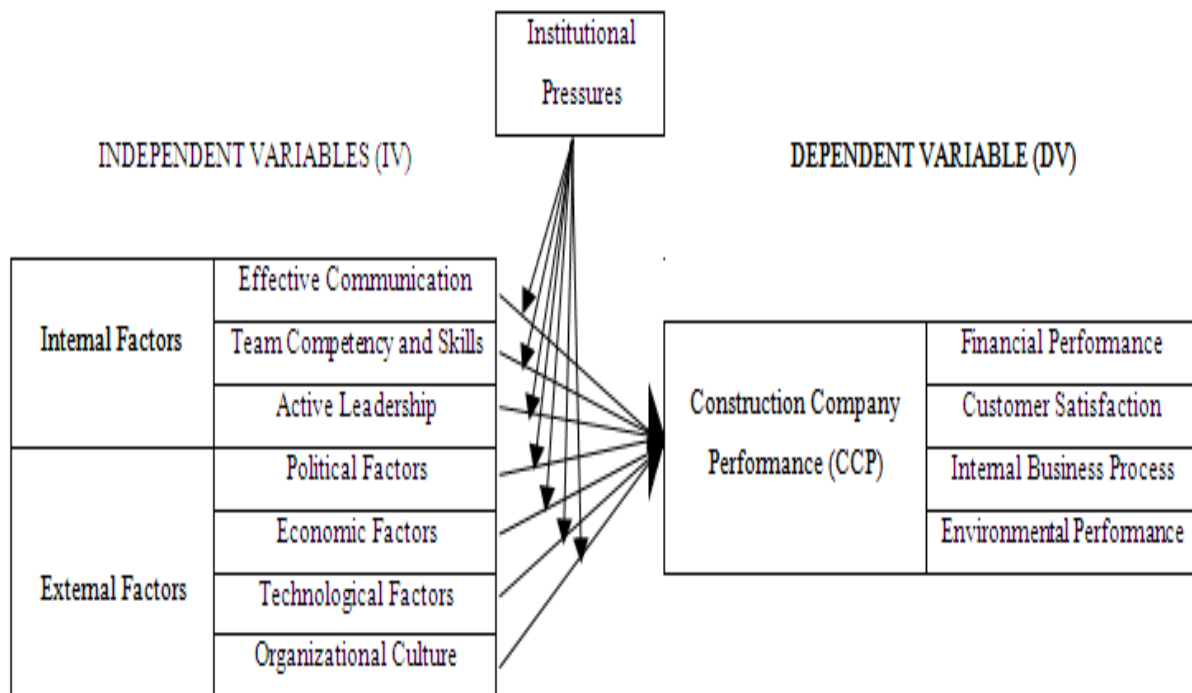
In Vietnam, Luu et al. (2008) integrated a matrix to assess the strategic performance of large contractors that combines a balanced scorecard (BSC) and strength-weakness opportunities-threats (SWOT) analysis. Similarly, In China, Jin et al. (2012) proposed performance measures based on BSC for evaluating the international construction performance of AEC firms. While in Iraq, Tofan et al. (2018) adopted five perspectives (financial, customer, social and environmental, internal business, and learning and growth) as performance measures. Hansen and Wernerfelt (1989) affirmed the relationship between organizational factors and a firm's performance, which is consistent with the study by Indris and Primiana (2015) in Indonesia, which confirmed that internal and external organizational factors affect small and medium industries (SMEs) performance. A positive relationship between internal, external organizational factors and construction performance management in Nairobi was assured by Jin (2018). It was noted that finance and organizational factors had influenced the performance of contractors delivering road projects on time in Gabon (Onana, 2018). From internal and external factors, competition was the only factor which had a significant association with the performance of SMEs in KwaZulu-Natal, South Africa (Sitharam and Hoque, 2016). There is a strong need for the formulation of a specific model that addresses the relationship between organizational factors and firm performance (Zhengge, 2015). The study results of Tung et al., (2011) reveal that organizational factors were associated with the effectiveness of PMS.

By an extensive literature review, the present study makes use of organizational internal factors (effective communication, team leadership and skill, and effective communication), while organizational external factors (political, organizational culture, technology and economic) were found to influence the construction firm's performance (see Fig 1). These factors were

chosen based on Adeleke et al. (2018). The reason for this is that these are the leading factors from the worldview that has been confirmed to influence construction performance.

The institutional theory asserts that conformity to institutional pressure enriches the survival chances of associations, and also reveals that organizational conformity to institutional pressure enriches the tactical advantages that associations receive (Colwell and Joshi, 2013). Zhu et al. (2008) claimed there is a moderating impact of institutional pressures on emerging green supply chain clinics and performance. Wang (2018) signalled that coercive and normative pressures positively and significantly influenced the execution of environmental management accounting, whereas mimetic pressure had no substantial effect on environmental issues and economic performance. Dubey et al. (2017) implied that both of these measurements of institutional pressures (i.e. coercive and normative pressures) are positively associated with this PMS, whereas the third measurement (i.e. mimetic pressures) does not impact PMS from Indian manufacturing corporations. Figure 1 illustrates the proposed research framework.

**Figure 1.** Conceptual framework



## Methodology

A deductive research approach using quantitative methods, a methodology widely adopted in social sciences, was carried out (Ryan, 2013). Farm (2010) as well as Aigbogun et al. (2017) asserted that the aim of a pilot analysis is to examine the reliability of measures as well as to

improve the contents of the questionnaire instruments. Reliability denotes that the set of items within a given scale are internally consistent with one another (Hair, 2014).

The research design of the present pilot study was based on a cross-sectional time horizon. Hence, the data was gathered at a single- point- in- time using a structured questionnaire (Cooper and Donald, 2014). A pilot study was executed within two months, which was conducted in Syria in August 2019. Multiple respondents represented different levels of operational positions (owner – contractor - consultant).

For a pilot sample, Treece (1982) proposed 10% of the main study size. Van Teijlingen and Hundley (2002) also proposed 10%. Based on the existing literature, Connelly (2008) recommends a pilot sample that consists of at least 10% of the size of the main study. According to Birks (2008), a pilot study mostly requires a range of 15-50 respondents. Isaac and Michael (1995) prescribed 10-30 participants and Hill (1998) prescribed 10-30 participants for pilots in survey research. Considering that this study is the pilot test of on-going research project, and following the practical suggestion proposed by Hill (1998), a total number of twenty (25) questionnaires were distributed with the return rate of twenty (20) which is sufficient for the pilot study analysis. This number represents a response rate of 80% of the total number of questionnaires distributed for the pilot survey; and 10% of the total target research population of the main study. The following subsections discuss the instrument design as well as the pilot and reliability tests.

### ***Instrument Design***

To assure the measurements of the variables, the items for this study were adapted from several sources. The questionnaire was divided into four parts: Part A, B, C, D.

Part A comprises items that provide the demographic profile of the respondents. This is essential in order to evaluate the suitability of the respondents in the survey, as well as their professional experience and knowledge in various types of construction projects. These items were adapted and modified from the background section of preceding literature (Gyadu-asiedu, 2009; Shebob et al, 2012; Mandisa, 2015; Maunula, 2014; Alsulamy, 2015; Alex, 2016).

Part B is comprised of items categorized in line with the dimensions of company performance measurement (Financial Performance, Customer Satisfaction, Internal Business Processes, and Environmental Performance). These items were adapted and modified from previous related studies (Luu et al. 2008; Jin and Deng, 2012; Al-Sulaihi and Al-Gahtani, 2013; Maya et al. 2015; Sonson et al. 2017; Tofan and Breesam, 2018).

Part C includes the factors affecting company performance outcomes, which is divided into two categories: Organizational Internal Factors (effective communication, team competency, skills, and active leadership) and Organizational External Factors (political factors, economic factors, technological factors, and organizational culture). These items were adapted and modified from previous related studies (Kumaraswamy and Chan 1998; Sun and Meng, 2009; Abu Bakar et al. 2012; Adeleke et al. 2018).

Part D consists of items categorized according to the dimensions of Institutional Pressures (coercive pressures, normative pressures, and mimetic pressures). These items were adapted and modified from previous related studies (Dubey et al. 2017; Iliya Nyahas et al. 2017).

A rating scale aids the researcher in calculating the standard deviation and the mean feedback on variables; it is also the mid-point of the scale (Sekaran and Bougie, 2016). Krosnick and Fabrigar (1997) argued that any scale between 5-7 points has a propensity of a high reliability and validity measurements when compared to a shorter or longer rating. However, Hinkin et al. (1997) and Garland (1991) implied that the alternative of this dimension scale chiefly is dependent on the selection of the researcher because there is no one superlative way of building a scale. An appropriate method for one research problem might not be appropriate for another. It was further argued by Krosnick and Fabrigar (1997) that the conduct created by respondents would be to meet or maximize the survey. Thus, the responses have been anchored on a 5-point Likert's scale ranging from: *1- Strongly Disagree; 2- Disagree; 3- Neutral; 4- Agree; 5- Strongly Agree*, in order to prevent the respondents from choosing an impartial position, which might lower the total reliability of the questionnaire.

Furthermore, the respondents have been given a choice to take part in the survey in either English or Arabic. A certified Arabic translator has been engaged to translate the English copy of the questionnaire into Arabic. Two other Arabic experts have been solicited to translate the Arabic version into English and compare it with the original English copy. This was done to ensure the equivalence of both versions (Chen et al. 2009; Dillman, 2013). The respondents have also been assured of their rights to privacy and confidentiality.

In order to determine the reliability of the scales in the questionnaire, the collected data has been analysed statistically using SPSS version 26.0. The reliability level of scales in the questionnaire has been verified by calculating the Cronbach alpha coefficient value of the items (Sekaran and Bougie, 2016).

Moreover, all of the constructs and variables in this study are multidimensional. The detail of the constructs and their analogous dimensions are depicted in Table 1.

**Table 1:** Source of the Questionnaire Measures

S/N	Variables	Constructs	Dimensions	Source	Remarks
1	Dependent variables	Firm Performance measurement dimensions	Financial Performance Customer Satisfaction Internal Business Processes Environmental performance	(Luu et al. 2008), (Jin and Deng, 2012), (Ali et al. 2013), (Maya et al. 2015), (Sonson et al. 2017), (Tofan and Breesam 2018).	Adapted
2	Independent variables	Organizational external factors  Organizational internal factors	Organizational culture Economic factor Technology factor Political factor Active leadership Team competency and skills Effective communication	(Abu Bakar et al. 2012) (Adeleke et al. 2018) (Sun and Meng, 2009), (Kumaraswamy and Chan, 1998)	Adapted
3	Moderating variable	Institutional Environment	Institutional Pressures	(Gunasekaran et al. 2015) (Gunasekaran et al. 2017) (Iliya Nyahas et al. 2017)	Adapted

### ***Pilot and Reliability***

The pilot study of this research was conducted in Damascus, Syria. The number of respondents consists of various occupation levels (owner – contractor – consultant) who work in various construction projects throughout Syria. Prior to carrying out the pilot study, content validity was conducted with four experts. Three of them are in academia. One was a practitioner. The feedback from the content validity was used to refine the measures in preparation for the pilot study.

According to Hair et al. (2014) a crucial step in the pilot test is to examine the reliability of the measurement scales in order to avoid any measurement errors. Having said that, an internal consistency reliability test was employed in this study.

The internal consistency of the measures had been ascertained by calculating the average inter-item correlations utilizing Cronbach alpha. Measures are generally reliable with the occurrence of greater correlation between other measures, or greater Cronbach alpha. There is a conventional lower limit of 0.70 for the Cronbach alpha, which is generally accepted. This is supported by George and Mallery (2003) who stated that in order for instruments to be considered reliable, the acceptable value of the Cronbach alpha coefficient needs to be 0.70 or greater.

Reliability testing was performed for all items except those related to the demographic profile of the respondents.

## Results and Discussion

Table 2 and Table 3, shown below, highlight the descriptive statistics for each demographic factor in this study, while Table 4 shows the reliability test results of the measurement scales.

**Table 2:** Summary of the Descriptive Profile of Respondents

Demographic Factor	Category	Frequency	Percentage (%)
Position in your company	Project Manager	3	15
	Engineer (Architect, structural, electrical, mechanical, Planner ...)	14	70
	Site Manager	3	15
Building construction do you engage in	Industrial buildings	2	10
	Administrative buildings (Infrastructures and services buildings).	18	90
Length of service in present role	Less than 5 years	7	35
	5-10 years	4	20
	10-15 years	1	5
	15-20 years	5	25
	more than 20 years	3	15
Level of education	Vocational Study	1	5
	BSc	17	85



	MSc	2	10
	PhD	0	0
Gender	Male	11	55
	Female	9	45

**Table 3:** Summary of the descriptive profile of the companies

Demographic Factor	Category	Frequency	Percentage (%)
The principal business activities of your company.	Government officials (Specialist, Professional, Mayors & Engineer)	20	100
The size of your company	Small (Number of employees < 50)	0	0
	Medium (Number of employees < 250)	3	15
	Large (Number of employees > 250)	17	85

**Table 4:** Reliability Test Results of the Measurement Scales

Constructs	Cronbach Alpha	No. of items
Financial Performance	0.904	10
Customer Satisfaction	0.823	10
Internal Business Process	0.909	19
Environmental Performance	0.903	10
Political Factors	0.897	4
Economic Factors	0.905	4
Technology Factors	0.909	4
Organizational Culture	0.781	5
Effective communication	0.712	2
Team Competency and Skills	0.906	3
Active Leadership	0.778	3
Coercive Pressures	0.778	3
Normative Pressures	0.856	2
Mimetic Pressures	0.779	3

According to the results seen in Table 4, all of the scales met the required Cronbach's Alpha and were considered reliable (Cronbach, 1951; George and Mallery 2003; Hair et al. 2014) The reliability result of this study revealed that the variables depicted in Table 4 are appropriate in being used for the main data collection for the analysis of this and future research.



## **Conclusion**

This study tests the reliability of the measurement scales used to measure the constructs for the present study. A set of questionnaires were distributed to 10% of the main target research population to determine the reliability of the measurement items, in addition to testing the comprehensibility of the instructions, and the wordings of the instrument. This study reports the reliability results of the measures. The reliability test for the internal consistency of scales used in the questionnaire was verified by calculating the Cronbach alpha coefficient value of a set of items. Reliability testing was constructed separately for each measurement. According to the results, all of the scales met the required Cronbach's Alpha (above 0.7) and were thus considered reliable. This result assures the ability of the survey questionnaire to create reproducible and consistent results. Therefore, it is expected that future studies empirically validate the proposed framework of this study.



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