



Vancouver, Canada

May 31 – June 3, 2017/ *Mai 31 – Juin 3, 2017*

OPERATIONALIZING PERFORMANCE IN PUBLICLY LISTED AEC FIRMS: THE DOMINANT DIMENSIONS

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Abstract: Organization performance is one of the most important constructs in management research, whereas determination of organization performance is essential for gaining robust results. Many organizations are investing considerable amount of resource implementing measures that reflect all dimensions of their performance. It is reported in the literature that consideration is being given to what should be measured today, but little attention is being paid to the question of what should be measured tomorrow. Despite numerous topics that have been demonstrated in the literature on performance, limited attention is paid to its measurement in empirical studies. The operationalization of organization performance provides rich implications for both researchers and practitioners. This issue is becoming more prominent in construction industry (AEC firms: Architect, Engineers and General Contractors), where the industry processes are typically prone to risks, which ultimately affects organizations' performance. The main objective of the paper is to explore various factors contributing to the performance of construction firms, making it more predictable, rather than measuring a single-item indicator. The article is capturing the different operationalization aspects of performance in construction industry. It presents an extension to the work done by one of the co-authors on Dominant Dimensions of Performance. Furthermore, the paper addresses two issues in the proposed performance operationalization, (1) the dimension, establishing which measures are appropriate to the research context: and (2) selection and combination of measures, establishing which measures can be usefully combined. Therefore, an overall concept rather than narrow, strictly economic criteria will be presented.

1 INTRODUCTION

In management studies, although researchers are typically focusing on the selection and measurement of their explanatory (Input) variables, organization performance was widely used as a response (Output) variable, whereas limited attention is paid to its measurement in empirical studies (Richard et al. 2009). Despite the growing recognition of strategic planning in the field of construction as evidenced by the works of many authors (e.g., Kangari 1988, Landford et al. 1993, Kale and Arditi 1999, and Katsanis 1998), however, approaches of operationalizing organization performance are still limited and understudied (Deng and Smyth 2013). As (Kale and Arditi 2002) have noted, many of the published works in construction industry are largely descriptive in nature and rely on anecdotal evidence. In addition to that, existing performance measurement models do not assist in understanding where the organization is positioned compared to the other firms, or how the organization will perform in the future, nor if the firm is improving over time. It is clear that more empirical findings are required to refine existing conceptual models and

furnish a better picture of corporate issues encountered by construction firms. The importance of performance as a measure of organizational effectiveness in construction industry organizations has been identified as a critical research issue (Katsanis 1998) and could provide rich implications for both researchers and practitioners.

2 PERFORMANCE IN CONSTRUCTION INDUSTRY

Existing research on construction industry (referred in different scholars as building industry or Architects, Engineers and General Contractors “AEC”) is dominated by project level studies. It is a project-based industry where each product (project) represents a large proportion of a firm’s total sales (Kaka and Lewis 2003), and known to be a contract-based industry in which each contract has considerable influence on the firm’s financial performance. Focus of research in the construction industry was dominated by issues and problems at the project level leading to organizational issues gaining very limited interest (Deng and Smyth 2013) and lacking of studies on long-term strategic issues at organization level (Yee and Cheah 2006). The study of (Lin and Shen 2007) shows that approximately 68% of reviewed Project Management studies in construction are focused on the project level.

In this context, the success of projects is generally regarded as an antecedent to construction firm success (Phua 2007), whereas organization performance in the construction industry is typically measured at the project level (Choi 2014), and each project stakeholder assesses project success on the basis of evaluation dimensions that fit within his/her own agenda or within the interests of the group they represent (Nielsen 2006). It is probably fair to conclude that the bulk of the published work on construction management is on the management of construction projects, rather than on the firms (Choi and Russell 2005, Winch 1989).

However, successful projects are likely to be a function of the general “health” of the construction organizations undertaking the projects in terms of strategic functions/activities. Hence, as reported by (Seaden et al. 2003) organization is the key factor that influences project tasks completion and project performance. Therefore, measuring project-level performance for only a few “even well chosen” metrics does not translate into robust evaluation of an entire firm (El-Mashaleh et al. 2007). Furthermore, the success of the firm depends in turn on strategic decisions, because these decisions determine the business mix of the firm (Choi and Russell 2005). The need for such strategic decisions, especially amongst construction firms, is due to the volatility of the construction market (Ibrahim and Kaka 2007). For sustainable competitiveness of construction organization, management must shift their focus from project level more towards the organization strategic direction (Vorasubin and Chareonngam 2007).

According to (Lin and Shen 2007), the number of papers focusing on measuring project level performance is much greater than those focusing on organizational-level performance because of the project-based nature of the construction industry. However, the same study indicated that the number of those later papers during the last three years has increased significantly showing a growing interest in performance measurement in construction. It can be attributed to several reasons; first, the boom in research on performance measurement in construction is a continuation of the rapid development of performance measurement in other sectors during the 1990s. The second reason is the increasing complexity of construction projects that require appropriate measurement tools to improve performance. The development of construction project management as well as building technology is another reason for growing interest on performance measurement.

3 THE DOMINANT DIMENSION OF PERFORMANCE

The importance of performance as a measure of organizational effectiveness in construction industry organizations has been identified as a critical research issue (Katsanis 1998) and could provide rich implications for both researchers and practitioners. It is argued by (Kaplan and Norton 1992) that economic performance of an industry is a function of the industry’s structure, and dimensions of performance can be very diverse and even subjective and context-sensitive (Katsanis 1998). Each industry has its specific variables and performance meaning and it is essential for the specifics of the industry to be counted when developing an organizational outcome measure.

In the context of the construction industry (or building industry), organizational outcome requires the identification, consideration and analysis of factors, tangibles as well as intangibles, that affect the outcome specifically applicable for this industry. (Katsanis 1998) in his research studied how each enterprise within the building industry (Architects, Engineers, and General Contractors) organizes their business. Using a multiple case study method, he studied the relationships between strategy, structure and performance in those three enterprises that operate under the current construction business environment. His research has introduced the concept of Dominant Dimensions of Performance which are grouped in three categories (business, practice and project performance). Those categories are linked to each enterprise of the construction industry (refer to Figure 1).

Business Related	Apply to:
Financial Performance Business Volume Growth Client Base Growth Staff Growth Continuity/Future/Stability Reputation/image	E/A/GC GC A GC A/GC GC
Practice Related	
Reputation Project Quality – Prestige Employee/Self Satisfaction The Process of Architecture/Related Inventiveness Ageless Projects	E/A E/A E/A A A A
Project Related	
Client Satisfaction Project Quality •Time •Cost •Technical •Aesthetic Quality of Work •Zero Defects •On Time •On Budget	A/GC A/E A/E A/E A/E A GC GC GC GC

Figure 1: The Dominant Dimensions of Performance (Katsanis, 1998)

In the realm of building industry, the Dominant Dimensions of Performance has provided several contributions towards the understanding of construction organization performance. More specifically, there were three main conclusions that provided significant insights towards this paper, and can be summarized as follow;

1. Although performance indicators tended to be financial for engineers and general contractors, with architects are more commonly focusing on issues of professional reputation, the financial performance has become important for all enterprises. Those should make financial performance a priority to balance the other appreciations of success.
2. Construction is an industry that is based on two levels of organizational objectives, those are;
 1. The temporary objectives of the project and the organization that is set up to build it, and

2. The permanent objectives of the involved firms, whereas the second objective includes the desire for firms to enhance their position in the marketplace.

This unique structure of the industry where organizations are operating in a discrete domain (project by project basis), is presented in the research through its third proposition, where “performance – usually broadly defined – is translated into measures of short to medium term financial performance which have repercussions on firm strategy and structure”.

And finally,

3. Having identified the relevant elements of performance, the suggested next step by (Katsanis 1998) is to empirically measure its dimensions and to assess how performance evaluation produces information about the environment.

Expanding on those three core ideas, this paper is proposing a multifaceted organization performance construct, or an operationalization approach for organization outcome.

4 ORGANIZATION OUTCOME – OUTPUT VARIABLES

In management studies, organization performance was widely used as an "Dependent – or Output Variable" (e.g., Ruigrok et al. 2013, Nielsen 2010, Auden et al. 2006, Diaz-Fernandez et al. 2014, Nielsen and Nielsen 2012, Hutzschenreuter and Horstkotte 2012, Angriawan 2009, Daily et al. 2000, Boone and Hendriks 2009, Carpenter 2002, Clark and Soulsby 2007, Cannella et al. 2008). However, the method of calculating organization performance was subject to slight differences between the studies. For example, Total Returns to Shareholders (TRS) was used by (William and Slocum 2012), Return Index (Nielsen 2010) and Return on Assets (ROA) (Diaz-Fernandez et al. 2014, Nielsen and Nielsen 2012, Hutzschenreuter and Horstkotte 2012, Angriawan 2009, Carpenter 2002, Cannella et al. 2008), while (Auden et al. 2006) suggested to use (ROA) but averaged over 3 years. Some other studies used combination between the Return on Assets (ROA) and Return on Sales (ROS) (Boone and Hendriks 2009, Clark and Soulsby 2007), while (Ruigrok et al. 2013) is also accepting (ROA) and (ROS) but to be averaged over 2 years. (Daily et al. 2000) is proposing a combination of three measure, those are Return on Assets (ROA), Return on Investment (ROI) and market-to-book ratio. Finally, (Lee and Park 2006) suggestion is to control the firm performance, and to be calculated by (ROA).

Given that performance is multifaceted and dynamic, selection of performance measures may affect the research results and interpretations (Deng and Smyth 2013). More importantly, conceptualizing and measuring firm performance depends on various issues, such as research questions, disciplinary focus, and data availability (Venkatraman 1987). Therefore, this paper is suggesting a generic reform of the “Business Related” aspects of the Dominant Dimensions of Performance. In Table 1 below, (Financial, Growth, Reputation and Continuity) are four different dimensions that found to be generic between all three enterprises of construction industry (Architects, Engineers and General Contractors).

Table 1: Generic Dominant Dimensions of Performance

Dimension	Katsanis, 1998	Enterprise*
Financial	Financial Performance	E / A / GC
Continuity	Continuity / Future / Stability (Business)	A / GC
Reputation	Reputation / Image	GC
	Reputation	E / A
Growth	Business Volume Growth	GC
	Client Base Growth	A

* A = Architect, E = Engineers, GC = General Contractors

Presenting organization outcome in dimensions, domains or categories are aligned with some previous studies. For example, (Venkatraman and Ramanujam 1986) presented three domains of business performance: (1) financial performance; (2) business performance (financial performance and operational performance); and (3) organizational effectiveness. Another example is the methodology proposed by, (Kim and Arditi 2010) where they applied 13 performance indicators under seven dimensions i.e., financial stability, customer satisfaction, business efficiency, learning and growth, job safety, technological innovativeness, and quality management, to measure firm performance. The suggested four dimensions in this paper (and their indicators which will be presented later) are also important in determining financial as well as non-financial dimensions of performance. It is, in reality, responding to the different other contemporary performance measurement frameworks which started to develop in full force by the late 1980s and into the early 1990s (Brignall et al. 1991, Azzone et al. 1991).

5 OPERATIONALIZATION OF PERFORMANCE: SUGGESTED MEASURES

In literature, two issues are argued to be addressed in any firm performance-related study: (1) the dimension: establishing which measures are appropriate to the research context, and (2) selection and combination of measures: establishing which measures can be usefully combined (Richard et al. 2009, Deng and Smyth 2013). This approach is consistent with the widely-accepted idea that organization outcome (or performance) is multidimensional and should include broader dimensions rather than more narrow, strictly economic criteria (e.g., Kaplan and Norton 1992, Richard et al. 2009, Venkatraman and Ramanujam 1986). Furthermore, performance measures are the means for determining the status of a success factor. A single success factor can be assessed using multiple measures. Terms such as indicators, metric and measurements are often used as synonyms for the term measure. However, (Ho et al. 2000) stated that there is an essential difference between these terms. According to them, the major difference between measurement and indicators is that the former is direct representation of the scale of the organization (internal) whereas the latter are figures that are comparable between organizations (external).

Table 2 shows the suggested measures, based on a literature review, a total of six different measures that could capture the overall organization outcome.

Table 2: Proposed Organization Outcome

Dimension	Link to Dominant Dimensions	Measures
Financial	Short Term Performance	Profitability Liquidity
Continuity	Medium Term Performance	Cash Flow Stability Capital Structure
Reputation Growth	Balance other appreciations of success	External Customer Satisfaction (Reputation) Internal Customer Satisfaction (Shareholder Value)

The description of those measures are detailed as below:

1. *Profitability*: sometimes referred to as positive financial performance, profit margin (Choi 2014), growth in revenue (Kim and Arditi 2010) and effective capital investment (Vorasubin and Chareonngam 2007). This measure has been calculated differently in various studies. For example, it is calculated as the sales volume (Choi and Russell 2005), as the growth in revenue (Kim and Arditi 2010), or defined as the pre-tax operating margin (Seaden et. al. 2003). In this paper, profitability is defined following the suggested measure by (El- Mashaleh et al. 2007) which equals the net profit after tax as a percentage of total sales.

2. *Liquidity*: also, known as access to capital or leverage. This measure is particularly necessary for construction firms because of financial cash flow fluctuations resulting from delay of payment by owners (Vorasubin and Chareonngam 2007) and the requirement of financial support (Chen 2011). In the same vein, (Cheah et al. 2004) concluded that some firms failed due to a lack of liquidity and/or high leverage. Liquidity is a relative measure of the “nearness to cash” of the assets and liabilities of a firm. The nearness to cash, in turn, refers to the length of time before assets can be converted into cash in order to cover short-term liabilities and obligations (Yee and Cheah 2006). It is particularly important in the contracting business, since a sufficient level of working capital is often vital to soften the effects of a timing mismatch between cash inflows and outflows. Liquidity has been widely measured in literature by the ratio of the total debt of the organization (Yee and Cheah 2006, Vorasubin and Chareonngam 2007, Chen 2011, Nielsen 2010, Nielsen and Nielsen 2012).
3. *Cash Flow Stability*: the financial stability of an organization is commonly used / quoted in different models proposed by different researchers (Phua 2007, El-Mashaleh et al. 2007). Depending on profitability alone will only provide a great view of where the company has been but does not provide much guidance for the future (Kim and Arditì 2010), while Cash Flow Stability represents how the organization was efficiently managing its cash flow (Vorasubin and Chareonngam 2007). It is measured by the ratio of annual revenue to total asset.
4. *Capital Structure*: in corporate finance theory, the proportion between debt and equity has strategic implications on a firm’s outlook, since it can both create opportunities and impose limitations (Grinblatt and Titman 2002). Capital structure is believed to be closely related to risk management. This is because debt per se would impose additional financial risks, such as the risk of bankruptcy, if a firm is unable to meet its debt service obligations. In this research, Capital Structure is calculated as a ratio of total debt to the value of total assets (Yee and Cheah 2006). Effectively, it measures the proportion of the assets of a firm that is financed by debt rather than equity.

All of the above measures are related to the Financial Wealth of an organization (whether on the short or medium span). From the Resource-Based Theory, the intangible strategic assets are also to be considered to complement the organization competency (Wethyavivorn et al. 2009). Intangible resources including human resources, reputations, customer loyalty, valuable relationships, and technological as well as managerial competencies are necessary complementary sources of advantage (Vorasubin and Chareonngam 2007). In this paper, the intangible resources are defined by two main indicators; External Customer Satisfaction and Internal Customer Satisfaction.

5. *External Satisfaction – Reputation*: it was mostly known as a subjective indicator in practice, and frequently used by researchers in construction to quantify the performance of construction firms (Deng and Smyth 2013). Excellent reputation development was ranked as the number one strategic asset in developing capabilities in construction industries (Wethyavivorn et al. 2009). 65% of the respondents of The Economist in a 2002 survey reported customers as their main focus (Kim and Arditì 2010), reflecting its importance in a project-based and various stakeholders involved industry. Client satisfaction is closely related to the intangible organizational reputation (Ho and Lin 2013), which is found to be the one of most important elements in explaining organizational performance (Carmeli and Tishler 2004). It affects the profitability of an organization. This measure was operationalized by repeated business (Kim and Arditì 2010), more specifically in this research, the growth in sector specific revenue is calculated (i.e. growth in organizations' outcome in the largest sector revenue: e.g., education, healthcare, leisure, etc.). Similar methodology has been utilized by (Ibrahim and Kaka 2007).
6. *Internal Satisfaction – Shareholder Value*: The objective of any organization is to manage a sustained performance that leads to superior returns for shareholders in the short and long term (Deng and Smyth 2014). According to neoclassical economic theory, the true owners of a publicly traded firm are its shareholders. This means that the firm’s management should focus on increasing the shareholders’ economic wealth (Choi 2014). The primary objective of modern firms is to increase shareholder value (Akalu 2001). In other words, sustained efforts to increase the firm’s value are the core elements of managing construction firms. In this paper, increasing shareholder value refers to the total market value of an organization, which is calculated as the Price / Earnings ratio.

Table 3: Proposed Measurement Methods

Nr.	Measures	Measurement Method
1	Profitability	Profit Margin = Net Profit After Tax / Total Revenue
2	Liquidity	Current Ratio = Current Asset / Current Liability
3	Cash Flow Stability	Asset Turnover Ratio = Ratio of Annual Revenue to Total Asset
4	Capital Structure	Ratio of Total Liability to the Total Assets
5	External Customer Satisfaction (Reputation)	Averaged Growth in Revenue in Major Sectors
6	Internal Customer Satisfaction (Shareholder Value)	P/E Ratio = Price / Earnings

6 CONCLUSION

The objective of introducing a new construct for Organization Outcome is to explore various factors that contribute to the operationalization of performance in construction firms, making firm performance more predictable in practice, rather than measuring a single-item indicator. (Venkatraman and Ramanujam 1986) argue that multiple-approach conceptualization of organization outcome can enhance the quality of business performance operationalization. Past research has strongly suggested the reliance on multiple measures to adequately capture firm performance (Daily et al. 2000). The special conditions of the construction industry, where the accounting cycle (accounting is based on time frame more than a year due to the project's lifecycle), imposes certain approaches for data collection and analysis. Whether a researcher is looking for a statistical correlation, mathematical modelling or a trend recognition, the accurate definition of those variables is critical to the success of any methodology and its validation.

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