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Resource-Based View in Construction Project Management Research: A Meta-Analysis

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Abstract: Resource-based view (RBV) is the theory that has been adopted as the theoretical background in construction project management (CPM) research to examine the impact of resources and capabilities on firm performance. Its primary assumption is that firms' performance and competitive advantages are enhanced by properly utilising valuable resources and capabilities. This paper aims to examine the effect of various constructs and relations used in preceding research by proposing a conceptual framework in the lens of RBV, which combined the multiple paths found in the literature. Then, hypotheses were developed to test the research framework empirically. This paper reports a meta-analysis of 20 journal papers published in the Scopus database in the area of CPM. The findings indicate that all the relationships between resources, capabilities, competitive advantage and performance were verified as significant. Moreover, the review pointed out that using capabilities and sustained competitive advantage in a mediated model is better than the direct effect model. Finally, a flowchart combining all the variables, construct, and paths was developed based on the results.

1. Introduction

One of the most important goals of construction project management (CPM) research is to examine integrating new resources, technologies, and strategies on the construction firms' performance [1]. A Conceptual Framework (CF) relating variables as dependent, mediator, and independent is constructed when examining such relationships or impacts among variables.

The resource-based view (RBV), proposed by Wernerfelt in 1984, is one of the most dominant theoretical views in the strategic management literature. RBV has been adopted as a significant theory to examine how resources can influence a firm by driving competitive advantage and enhancing performance. Consequently, RBV is frequently used as a lens when developing CF in CPM [2].

Although the adoption of RVB to develop CF makes a great deal of sense and a large number of papers examining the impact of resources on firms using its lens have been published [3], the frameworks are inconclusive; multiple paths, relationships, and variable mediator variables are used. In addition, there has been some criticism on the conceptualisation of the RBV [2]. Consequently, it is helpful to conduct meta-analysis research to compare developed CFs and examine the inconsistencies in CPM literature.

This paper aims to report the findings of a meta-analysis on CF developed in the lens of RBV (RBV-CF) in journal papers published in the Scopus database in the area of CPM since 2015. Following the methodology and framework proposed by [4], to examine the effect of various constructs and mix measures used by preceding research. As a result, a framework was proposed and tested; then, a flowchart was constructed.

2.   Literature Review and Research Framework

2.1   RBV Theory

The growth and maturity of the RBV theory were due to the contribution of many scholars in recent years [5]. The primary tenants of the RBV are familiar to scholars, and a detailed review is beyond this research scope. [6] summarised selected critical papers in the development of RBV over three product life cycle stages; introduction, growth, and maturity. According to Jay Barney, an RBV pioneer, it took the RBV twenty years (1991-2011) to be mature enough to be called a theory, referring to it as resource-based theory (RBT) [7]. Since its development in 1984, RBV has been reviewed, subjected to criticism, applied in various fields, and extended by many researchers [8].

One of the strengths of RBV is its ability to be theoretically conceptualised and thus empirically tested. Hence, scholars tend to adopt RBV in their theoretical framework and as a lens for constructing the CF.

2.2   RBV Key Constructs

A literature review reveals four key constructs in the RBV-CF; resources, capabilities, competitive advantage (SCA), and performance. Those constructs represent three types of variables; independent, mediators, and dependent. According to the RBV assumption, firms' performance and competitive advantages are enhanced by properly utilising valuable resources and capabilities. Resources and capabilities are independent variables that influence performance and capabilities as the dependent variables. Similarly, according to the argument, the effect of resources on performance requires other factors; capabilities and SCA became the mediator that affects the relationship between performance and resources [9].

Firm Resources. Resources are essential for the initial function, and without these factors, the firm could be unable to achieve development. The RBV theory explains and predicts the relationship between firms resources and competitive advantage. According to [10], who is considered the first to introduce RBV theory, resources and products are two sides of the same coin. Returns could be increased by identifying and acquiring the critical resources, and the firm's performance is indirectly driven by the resources used in the production [11].

Firm Capabilities. The second theoretical approach within RBV argues that the effect of resources on performance requires other factors. Emerging from [12] dynamic capabilities research, resource was also classified into resources and capabilities. According to this classification, resources were defined as factors controlled or owned by the organisation; these resources could be transferred into the final product/service using the organisation's assets and machines. Capabilities were defined as the capability of the organisation to deploy resources to achieve the desired end [13].

Firm Performance. Firm performance is the most significant and most commonly used dependent variable in the RBV-CF. Existing previous research has used various types of performance in their frameworks; Operational performance, business performance, organisational performance, environmental performance, firm performance, and others [14].

Sustainable Competitive Advantage. While performance and competitive advantage terms are frequently used interchangeably, they are conceptually distinct [15]. Firm competitive advantage and SCA were introduced to RBV by [16]. According to his research, when a firm is implementing a valuable strategy that other competitors do not simultaneously implement, it is said that it has a competitive advantage. Similarly, when a firm is executing a beneficial strategy that other competitors

do not at the same time implement and when competitors cannot duplicate the benefits of this strategy, then it is supposed that the firm has a sustained competitive advantage.

3.   Research Framework and Hypotheses

The research framework was developed based on the literature review and [4] research, as illustrated in Figure 1. According to the research framework and the reviewed papers, it was concluded that RVB-CF follows one of four paths.
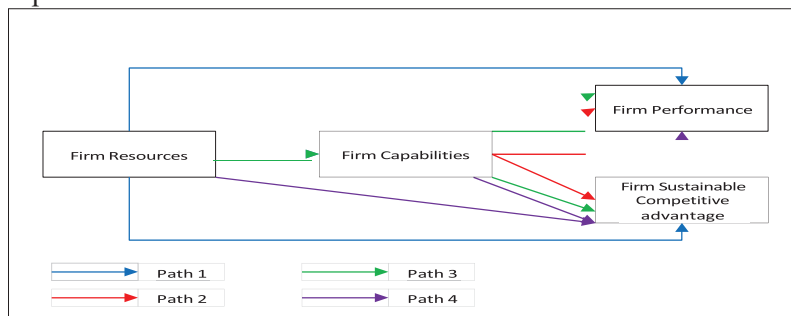

Figure 1.   The RBV-CF paths

As indicated from the paths illustrated in Figure 1, Path 1 and 3 are used when existing studies aimed to investigate resource impact on performance in direct (Path1) and indirect (Path3) ways. Capabilities in CPM research is seen as a mediator rather than an independent variable. Finally, the SCA is usually seen as a mediator rather than a dependent variable. The construction companies focus more on enhancing the performance rather than the SCA (paths will be furthered discussed in the SLR results). Based on the proposed framework and those paths, this research hypotheses could be formulated as shown in Figure 2.
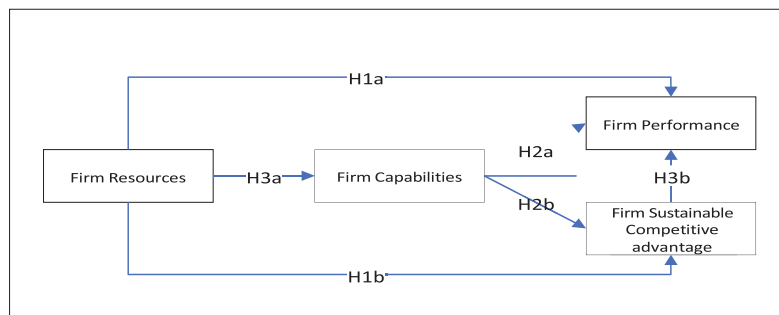
Figure 2.   The framework of this resear

4.   Methodology

4.1   Meta-Analysis

Meta-analysis is a quantitative approach to summarise quantitative studies [17]. A meta-analysis isa systematic tool which uses evidence from previous empirical studies to help researchers summarise relationships between variables. The meta-analysis is used to draw insight into relationships with no validation and direction consensus.

4.2   Data Collection

Meta-Analysis is usually carried out using large databases that contain a broad set of publications and effective search mechanisms, which allow complex logical expressions to be used. Scopus databasewas selected in this research. Multiple keywords were used to search relevant papers, including "Conceptual model/ framework AND Resource-based view/R.B.V." for the interval from 2015 to 2019

since the search was conducted in early 2020 to capture papers published in the last five years. The initial research resulted in a total of 139 papers. After several refinements in the search, 46 papers wereselected for the review using the preferred reporting item for systematic reviews and meta-analysis: thePRISMA statement (http://www.prisma-statement.org/). When screening the papers for the Mata- analysis, the availability of the data-analysis results, namely; correlations and sample size, is the used criteria [17]. From the results of 46 publications, only 20 were suitable for our Meta-Analysis (Figure 3).

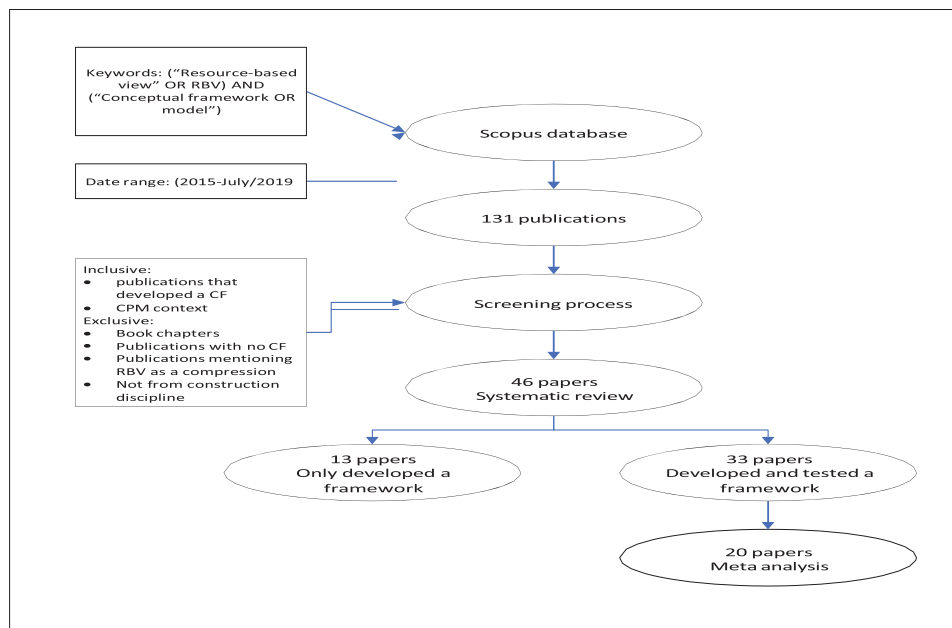

Figure 3.   PRISMA flow of information diagram

5.   Meta-analysis: results and discussion

5.1   Descriptive Results

A total of 107 functional correlations were reported in the 20 identified papers. Table 1 summarisesthe descriptive results of those correlations. As concluded from the descriptive results, papers between 5-17 and correlations between 6-32 are used to study each relationship. Moreover, it was noticed that most studies are significant, but inconsistent findings also exist in identified published research.

5.2   Hypothesis Testing

Hedges' gs were calculated for all the studies and relationships. The estimated effect size is characterised as medium (>0.60) for the resources-performance and resource-capability connection, while it was characterised as large (>0.80) for the remaining identified relationships (Table 2). Moreover, table 2 shows that all the relations were heterogeneous ($I^2=84.4-94.7$).

	Table 1		Descriptive results for identified correlations		
HYP.*	**REL.***	**NO. OF STU.***	**NO. OF REL.***	**SIG.***	**NOT SIG.**
H1a	RES>>PER	17	32	25	7
H1b	RES>>SCA	6	9	7	2
H2a	CAP>>PER	16	22	20	2
H2b	CAP>>SCA	5	6	5	1

HYP	REL	NO	STU		SIG
H3a	RES>>CAP	14	32	22	10
H3b	SCA>>PER	5	6	5	1

* HYP (hypothesis), REL (Relatioship), NO (number) , STU (studies), SIG (significant)

Table 2. Summary of meta-analysis results

	EFFECT SIZE & 95% CI							TEST OF NULL		HETEROGENEITY			
	NO of Rel	Sample	Hedges' g	SE	Var	Lower limit	Upper limit	Z-value	P-value	Q-value	DF	P-value	I^2
RES>>PER	32	3825	0.679	0.025	0.001	0.630	0.728	27.223	0.000	198.835	31	0.000	84.409
RES>>SCA	9	1096	0.877	0.053	0.003	0.773	0.980	16.632	0.000	54.282	8	0.000	85.262
CAP>>PER	22	3582	0.883	0.032	0.001	0.822	0.945	27.968	0.000	295.435	21	0.00	92.892
CAP>>SCA	6	1095	0.954	0.063	0.004	0.830	1.078	15.121	0.000	70.257	5	0.000	92.883
RES>>CAP	32	3366	0.771	0.024	0.001	0.724	0.818	32.225	0.000	589.812	31	0.000	94.744
SCA>>PER	6	777	1.007	0.069	0.005	0.872	1.143	14.553	0.000	78.221	5	0.000	93.608

The analysis examined six fundamental relations found in CF developed through the lens of RBV. Effect sizes with their 95% CI are presented in table 2. Reliability, number of studied connections, and total sample size of each relationship are also summarised in table 2. The results show that firms' resources were found to have a significant positive impact on the firm's performance and SCA, which support hypotheses H1a and H1b. Regarding the impact of a firm's capabilities, H2a and H2b are also supported with a significant positive relationship. H3a and H3b support that there is a significant positive effect between variables. The z-value scores and their corresponding P-values ($P< 0.05$) further strengthen the above results.

Based on the results, the correlation between SCA and performance is ranked as the highest (Hedges' g= 1.007). This is consistent with the argument that SCA is an antecedent to performance, proposing that SCA and performance should be empirically tested as related but separated variables [18]. However, the 95% CI of the SCA/ performance relationship is considerably broad (0.87-1.14); this may result from the mixed findings in the literature. The correlation between the firm's capabilities and SCA and performance was high with Hedges's > 0.80, which is relevant to Teece, Pisano [12] dynamic capability view.

Considering the impact of the firm's resources, it was found that the resource impact on performance was lower than the impact of the resources on SCA. The resource-performance relationship has a medium effect (Hedges' g= 0.679) size. In contrast, resource-SCA has a high effect size (Hedges' g= 0.878), which also supports [16] argument that SCA must be used as a mediator between resources and performance [14]. Nevertheless, resources were found to have a medium effect on capabilities with Hedges' g of 0.771. This outcome could be due to the argument that capabilities have a vital role as a mediator rather than focusing on its direct effect [14, 19].

6.   Conclusions and Recommendations

This research aims to examine the application of RBV in the CPM research by examining the relationship between RBV key constructs in the CPM domain. To achieve this objective, hypotheses were formulated and tested using the meta-analysis. In this research, 47 published studies on using RBV as a lens to construct CF were reviewed, concluding the following. First, using capabilities as a mediator between resources and performance in frameworks was used more than direct relation framework, supported by the meta-analysis results. Second, using SCA as a mediator and antecedent to performance were supported by the meta-analysis results. Nonetheless, few CF adopting this argument were found.

To begin with, the research investigated the link between the RBV and the CPM by reviewing the RBV assumptions. This contributes as a rationale for future researchers when deciding to chose RBV as their theoretical lens. Subsequently, The main objective of this paper was to report the findings of a meta-analysis on RBV in CPM research. The results of the research were summarised in the form of a flowchart. Fundamentally, a flowchart for constructing an RBV-CF was developed to assess future research while developing frameworks, varying from frameworks examining the direct relationship between only two constructs to frameworks examining multiple relationships with multiple constructs and mediators. Figure 4 illustrates the steps for constructing a CF with RBV as a theoretical lens.

Moreover, the findings of the Meta-analysis research contributes to the CPM research in significant ways. Foremost, the results provide evidence that a significant positive relationship exists between the multiple RBV construct in the CPM domain, which indicates that resources and capabilities are essential in enhancing the performance and SCA of construction firms. Secondly, the results revealed the effect size for each relation. Indicating which path should be adopted by CPM researchers to achieve the more significant effect size. Expressly, the research showed that by better understanding the relationships and the effect size, the following Path: (RES >>> CAP >>> SCA >>> PER) would achieve a higher impact and better results for construction companies. The findings presented in this research have drawn attention to the significance of SCA and its capabilities in mediating the relationship and ensuring that performance is enhanced by deploying the proper resources.

There are some limitations to the meta-analysis; collected data have different attributes at different times. Such different attributes are different firm sizes, national conditions, or economic environments. These factors could cause biased observations. Nonetheless, more robust conclusions could be derived from the meta-analysis aggregated results as they are derived from a large sample. The findings also indicate that more research may be needed to investigate why specific paths are chosen when constructing CF and what other mediators could be found.
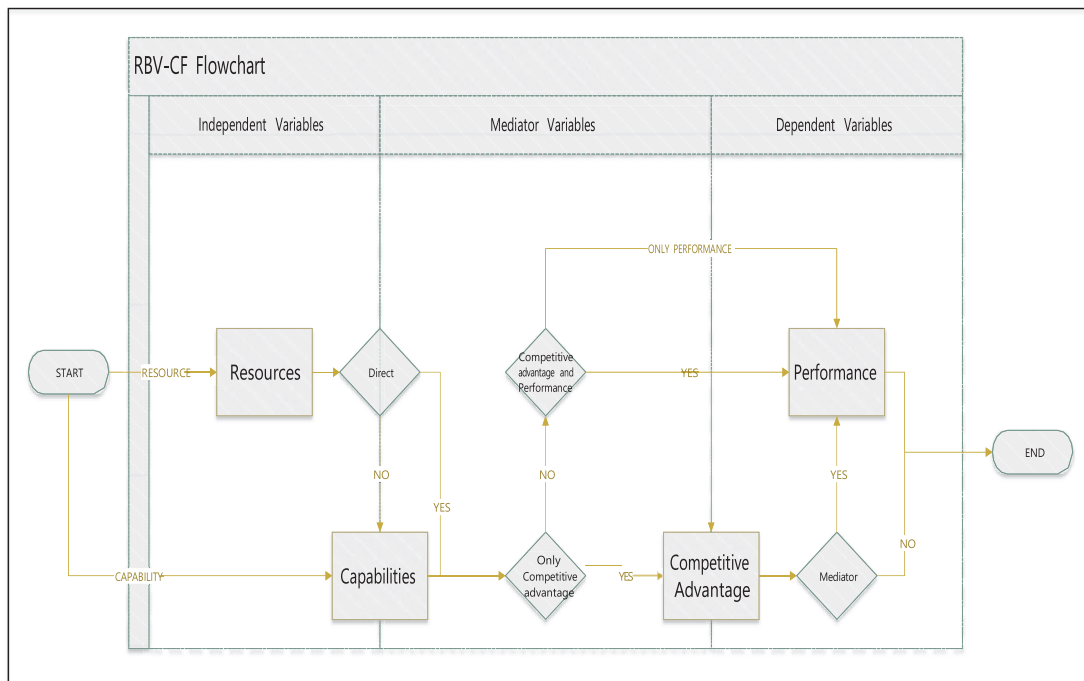

Figure 4.   RBV-CF Flowchart

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