

The Impact of Organizational Culture on Organizational Effectiveness in Construction Projects

Yuming Song^{1, a *}, Yun Le^{1, b}, Yaqin Wang^{2, c}

¹Department of Project Management and Real Estate, Tongji University, China

²Department of Electronic Commerce, Shanghai University of International Business and Economics, China

^atjsongyuming@163.com, ^bleyun@kzcpm.com, ^c031021065@fudan.edu.cn

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Abstract. A majority of research show that organizational culture is context-specific and it can impact organizational effectiveness positively. But few empirical studies have probed into the relationship in the context of project-based organizations. A survey was conducted of construction projects in China with the aim of better understanding the relationship. Based on 512 samples, the findings indicate that there exist differences in the relationship between four culture types and organizational effectiveness. The results show that clan and hierarchy cultures have greater positive effect on organizational effectiveness than market and adhocracy cultures. Moreover, this research examines the possible moderating effects of project size in the relationship between organizational culture and organizational effectiveness. The findings validate that project size has not moderated the impact of organizational culture on organizational effectiveness. Future research is necessary to identify other moderators in the relationship between organizational culture and organizational effectiveness.

Introduction

With the rapid development of construction industry in China, the scale, duration and complexity of construction projects increases constantly. However, the organizational effectiveness of construction projects is still in the poor level. It is a critical issue to improve the organizational effectiveness of construction projects in the complex and changeable environment in China. More researchers find that excellent organizational culture can not only improve the organizational effectiveness by changing the notions of organization members, but also provide the organization with source for sustainable competitive advantage.

The existing literature review shows that organizational culture plays a positive influence significantly on the long-term organization effectiveness [1, 2]. However, the previous studies in the relationship between organizational culture and organizational effectiveness are limited in the field of project management. On the other hand, the related research findings in western countries may not be applicable to Chinese context completely due to individualism-collectivism culture differences. The contextualized study has become more important in management research and a key factor in empirical research in China [3]. Therefore, it is necessary to further verify the impact of organizational culture on organizational effectiveness in Chinese context.

The purpose of this study is to validate the impact of organizational culture on organizational effectiveness in Chinese context. And this study attempts to explain which type of organizational culture can achieve higher level of organizational effectiveness in construction projects.

Theoretical Framework and Research Hypotheses

The Concept of Organizational Culture and Competing Values Framework. Different definitions on organizational culture can be found in the existing literature. Organizational culture is defined as a set of values, norms and assumptions shared by organizational members [4].

Organizational culture with the characteristics of values, scarcity and inimitability can be a source of sustained competitive advantage [5]. The majority of existing studies show that organizational culture is a key factor to attain organizational effectiveness [6, 19]. Although organizational culture is a multi-dimensional concept, most of organizational researchers admit a general consensus that it refers to values, norms, goals, beliefs and basic assumptions held by all members of an organization.

Quinn and Rohrbaugh [7] proposed a valuable analysis method of Competing Values Framework (CVF) in order to understand organizational effectiveness. The competing values framework was later utilized to assess organizational culture [8]. The CVF recognizes the nature of organizational culture along two major dimensions: stability/flexibility structure and internal/ external focus. The two dimensions form four quadrants to represent four culture types: the clan, the adhocracy, the market and the hierarchy.

Clan culture emphasizes high flexibility and internal focus. The main characteristics are teamwork and supportive environment. This type of culture values cohesiveness, participation, loyalty, and commitment [8]. *Adhocracy culture* emphasizes high flexibility and external focus. This type of culture values creativeness, adaptability and entrepreneurship [9]. *Market culture* put an emphasis on high stability and external focus. The main characteristics are goal attainment and competitive environment. This type of culture values competitiveness, efficiency and goal accomplishment [8, 10]. *Hierarchy culture* places an emphasis on high stability and internal focus. This type of culture values stability and formal procedures [8].

The Concept of Organizational Effectiveness. Different or even controversy definitions on the construct of organizational effectiveness exist in the existing literature. Organizational effectiveness refers to the degree in which an organization realizes its multiple goals [11]. Some researchers equate organizational effectiveness with organizational performance [12]. But more researchers reach a consensus that the concept of organizational effectiveness is wider. Organizational performance refers to task completion and goal accomplishment, whilst organizational effectiveness reflects the overall performance of an organization in all aspects, which is a key indicator to evaluate the growth and development of an organization in future [13, 14]. Many empirical studies on effectiveness in temporary organizations like projects focus on the “iron triangle” of cost-, time- and quality-related goals [15]. More research trends to complement increasingly external dimensions like level of stakeholders’ satisfaction towards the internal dimensions of organizational effectiveness [16].

Organization Culture and Organizational Effectiveness. The relationship between organizational culture and organizational effectiveness has always been the focus of management theory and empirical research. A majority of existing literature shows a positive relationship between organizational culture and organizational effectiveness. Organizational culture exerts its impact on an organization's effectiveness through directing the organizational members to behave in ways that are consistent with its culture [17]. According to empirical evidence, Kotter and Heskett [18] believed that organizational culture played an important role on firm outcomes and its long-term success. Organizational culture can exert positive impact on high performance and bring sustainable competitive advantage for an organization [19].

Based on the prior research, we propose the following hypothesis:

H1. Organizational culture has a positive effect on organizational effectiveness.

Although many researchers agree to the above assertion, there are arguments that different types of organizational culture may have no effect or even negative influence on organizational effectiveness. Based on the cross-culture research on the enterprises in ten developing and developed countries, Deshpande et al. [20] found that open and innovative organizational culture has a positive effect on organizational effectiveness. Zhang and Wang [21] conducted the empirical study and found that the cultures of clan, adhocracy, market and hierarchy had positive effects on organization learning, internal process, customer satisfaction and financial performance respectively. Gregory et al. [22] conducted the empirical research on a large sample of healthcare facilities from CVF prospective, and found that a positive relationship between group culture and organizational effectiveness such as patient satisfaction. Hence, we propose the following hypotheses:

H1a. Clan culture has a positive effect on organizational effectiveness.

H1b. Adhocracy culture has a positive effect on organizational effectiveness.

H1c. Market culture has a positive effect on organizational effectiveness.

H1d. Hierarchy culture has a positive effect on organizational effectiveness.

Moderating Role of Project Size. The relationship between organizational culture and effectiveness is also restricted by internal and external environment factors. Organizational culture may not have the same effects on organizational effectiveness under various environmental conditions. According to the existing literature, several researchers have suggested organization size may play a moderating role in the relationship between organizational culture and effectiveness. The empirical research validated customer-oriented organizational culture may lead to high firm performance, and the firm size moderated the relationship between organizational culture and performance [23]. Zhang et al. [24] examined the relationship between marketing orientation and firm performance from a cultural prospective, and found the moderating effects of ownership type and firm size in this relationship. Therefore, we develop the following hypothesis:

H2. Project size has a moderating effect between organizational culture and organizational effectiveness.

Table 1 The profile of respondents.

| Variable | Category | Number | Percentage |
|-----------|--------------------------|--------|------------|
| Gender | Male | 388 | 75.8 |
| Gender | Female | 124 | 24.2 |
| Age | >50 | 32 | 6.2 |
| Age | 41-50 | 90 | 17.6 |
| Age | 31-40 | 195 | 38.1 |
| Age | 21-30 | 193 | 37.7 |
| Age | <20 | 2 | 0.4 |
| Education | Master's or Ph.D. degree | 74 | 14.5 |
| Education | Bachelor's degree | 279 | 54.5 |
| Education | Associate's degree | 142 | 27.7 |
| Education | High-school diploma | 17 | 3.3 |
| Tenure | >20 | 68 | 13.3 |
| Tenure | 16-20 | 65 | 12.7 |
| Tenure | 11-15 | 105 | 20.5 |
| Tenure | 6-10 | 136 | 26.5 |
| Tenure | <5 | 138 | 27.0 |
| Position | Director | 69 | 13.5 |
| Position | Manager | 99 | 19.3 |
| Position | Superintendent/ Planner | 154 | 30.1 |
| Position | Specialist | 190 | 37.1 |

Research Method

Sampling and Data Collection. A quantitative survey was conducted in order to examine the relationship between organizational culture and organizational effectiveness in construction projects. The targeted respondents were identified as the medium/senior individuals who engaged in project management. In order to obtain a representative sample, the geographic mix of projects and specified mix of project size was intentionally diverse. All the data were collected via paper and online surveys. Ultimately, 512 survey responses were used in the data analysis. Table 1 presents the profile of respondents.

Measures. Multi-item scales were adapted for independent and dependent variables in the theoretical model. Organizational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn [8] was adopted for measuring the dominant organizational culture (independent variable) across six key facet: dominant characteristics, organizational leadership, management of employees, organizational glue, strategic emphasis and criteria for success. Each facet has four alternative statements with a total

of 24 items. All respondents were asked to rate the organizational culture on a five-point Likert scale with the highest score of 5 representing “totally agree”.

The measurement tool assessing organizational effectiveness (dependent variable) were adapted from Pinto et al. [25] and Cheung et al. [26] consisting of 10 items on “iron-triangle” and other “soft” indicators such as satisfaction of relevant stakeholders.

Data Analysis. In this study, structural equation modeling (SEM) is used with AMOS statistics package to assess the measurement model (factor analysis) and structural model (path analysis).

Results

Measurement Model Testing Results. The descriptive statistics of measures of organizational culture and organizational effectiveness was undertaken for the initial exploration of collected data. Table 2 shows the descriptive statistics for the constructs.

Table 2 Descriptive statistics for the constructs.

| Constructs | M | SD | 1 | 2 | 3 | 4 | 5 |
|---------------------------------|------|------|--------|--------|--------|--------|--------|
| 1. Clan culture | 3.88 | 0.66 | (0.85) | | | | |
| 2. Adhocracy culture | 3.69 | 0.73 | 0.82** | (0.88) | | | |
| 3. Market culture | 3.83 | 0.64 | 0.81** | 0.82** | (0.83) | | |
| 4. Hierarchy culture | 3.88 | 0.65 | 0.83** | 0.75** | 0.83** | (0.84) | |
| 5. Organizational effectiveness | 3.89 | 0.64 | 0.64** | 0.62** | 0.63** | 0.63** | (0.90) |

Note: Coefficient alphas are shown in parentheses on the diagonal, * $p < 0.05$, ** $p < 0.01$, $n = 512$.

Confirmatory factor analysis (CFA) was conducted to test the measurement models. Multiple fit indices were used to assess the overall fitness of measurement models as shown in Table 3.

Table 3 Evaluation of measurement models for the constructs.

| Variables | chi-square | df | p | NFI | CFI | GFI | RMSEA |
|------------------------------|------------|-----|--------|------|------|------|-------|
| Organizational culture | 692.90 | 237 | <0.001 | 0.91 | 0.94 | 0.89 | 0.061 |
| Organizational effectiveness | 116.41 | 32 | <0.001 | 0.96 | 0.97 | 0.96 | 0.072 |

Based on the above testing results, the scales in this study met the recommended levels. Additionally, the composite reliability for the constructs was above 0.7 level [27], providing evidences on reliability of each construct.

Structural Model Testing Results. A feasible model was selected based on the recommended overall model fit measures. Fig. 1 presents the results of the overall model fit in the structural model. The values of NFI, CFI and GFI were 0.955, 0.969 and 0.938 respectively, which were all above the acceptable level of 0.90 [28]. Furthermore, the value of RMSEA was 0.064, which was below the cut-off level of 0.08 [29].

H1 proposed a positive effect of organizational culture on organizational effectiveness. This hypothesis is supported because the standardized coefficient is 0.744 and statistically significant ($p < 0.001$). H1a proposed a positive effect of clan culture on organizational effectiveness. This hypothesis is supported significantly with a standardized coefficient of 0.286 ($p < 0.01$). H1b proposed a positive effect of adhocracy culture on organizational effectiveness. This hypothesis is partially supported because the standardized coefficient is 0.116 but not significant in statistics ($p > 0.05$). H1c proposed a positive effect of market culture on organizational effectiveness. This hypothesis is supported significantly with a standardized coefficient of 0.269 ($p < 0.05$). H1d proposed a positive effect of hierarchy culture on organizational effectiveness. This hypothesis is supported significantly with a standardized coefficient of 0.300 ($p < 0.001$).

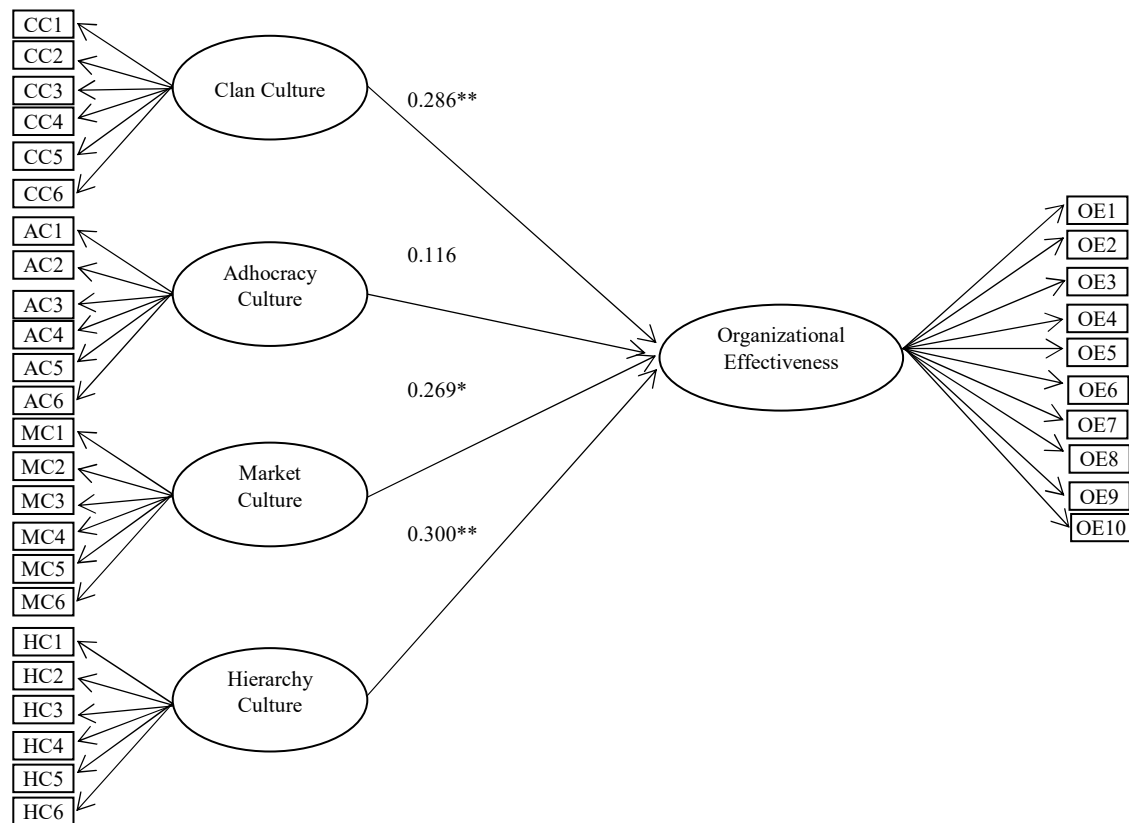


Fig. 1 Overall model SEM estimates results.

Table 4 Moderating effect for organizational effectiveness.

| Variable | Organizational Effectiveness | | |
|---------------------------------|------------------------------|-----------|-----------|
| | Model 1 | Model 2 | Model 3 |
| Control variable | | | |
| Project complexity | -0.001 | -0.033 | -0.030 |
| Project duration | 0.054 | 0.009 | 0.006 |
| Number of project members | -0.079* | -0.032 | -0.030 |
| Nature of superior organization | 0.030 | 0.025 | 0.026 |
| Independent variable | | | |
| Organizational culture (OC) | | 0.693*** | 0.660*** |
| Moderating variable | | | |
| Project size (S1) | | 0.061 | 0.055 |
| Project size (S2) | | -0.093 | -0.099 |
| Interaction | | | |
| OC×S1 | | | 0.089 |
| OC×S2 | | | 0.011 |
| F test | 2.559* | 66.381*** | 52.467*** |
| R-squared | 0.020* | 0.480*** | 0.485*** |

Note: * $p < 0.05$, *** $p < 0.001$, $n = 512$.

Moderating Effect of Project Size. Hierarchical regression analysis is used to examine whether project size has a moderating effect in the relationship between organizational culture and organizational effectiveness. Project size is classified into three categories by total investment value: small size (i.e. <\$5 million), medium size (i.e. \$5-50 million), and large size (i.e. >\$50 million). Table 4 summarizes the regression results for organizational effectiveness. From step 1 to step 3, this study entered the control variables, organizational culture/project size, and the interaction of organizational culture and project size. Additionally, two dummy variables represented project size in three categories.

Step 3 indicates that there is no significant interaction of organizational culture and project size for organizational effectiveness. Project size has not a moderating effect in the relationship between organizational culture and organizational effectiveness. Therefore, H2 is not supported.

Conclusions and Future Research

Conclusions. The research findings provide empirical evidence on several unresolved issues in the context of construction projects in China.

First, besides providing empirical evidence on the impact of organizational culture on organizational effectiveness, this study demonstrates there are differences in the relationship between four types of cultures and organizational effectiveness. The results support that clan and hierarchy cultures have greater positive effect on organizational effectiveness than the other two culture types. And adhocracy culture has minimal positive effect on organizational effectiveness but the influence is insignificant.

Second, project size has not a moderating effect in the relationship between organizational culture and organizational effectiveness. This study finding provides the chance for further exploration of other environmental factors encountered by project-based organization.

Third, this study verifies the related research results in western literature are also applicable in Chinese context, i.e. organizational culture has a positive effect on organizational effectiveness.

Future Research. The research findings also present the directions for future research. First, since the samples for this study focus on projects in the construction industry, more empirical research in other industries are meaningful for enriching the literature in project management. Second, since a project-based organization may encounter various environmental factors, future research is needed to identify other moderating variables in the relationship between organizational culture and organizational effectiveness. The cross-sectional research design represents a limitation of this study. The longitudinal design may be needed for further exploration in the relationship between organizational culture and organizational effectiveness.

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