# Factors Influencing Adoption of Frugal Practices in Public Building Projects Delivery in Southwest, Nigeria

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**Abstract-The inefficient use of resources and the prevalence of substandard practices in public building projects pose significant challenges to sustainable development and economic growth, this has necessitated research into the drivers of adoption of frugal practices towards improvement in project delivery in the public sector. Specifically, this study examined the effect of factors responsible for the adoption of frugal practices on Public Building Projects Delivery among public universities in Southwest, Nigeria. The study adopted the survey research design which involved the use of a structured questionnaire. A total population of 709 and cond contractors building professionals across the public universities from Lagos, Osun and Ondo States. From the population, the study obtained a sample size of 251 professionals in the study area. The study's objectives were examined through using inferential statistics through structural equation modelling in partial least squares (PLS-SEM) with the aid of SMART-PLS. Findings revealed cashflow challenges emerge as a significant factor influencing project delivery, with substantial explanatory power, this underscores the need to address cashflow challenges and factors of frugal practices to enhance project delivery efficiency. The study therefore recommended among others that stakeholders should implement measures to enhance financial planning and management. Strategies such as securing project funding in advance, establishing transparent budgeting processes, and negotiating favourable payment terms with suppliers can help mitigate cashflow constraints**

**Keywords:** ***Frugal practices, influencing factors, building project delivery, public universities, infrastructure development***

## 1. INTRODUCTION

In Nigeria's construction industry, the persistent issue of building failures and project abandonment continues to raise concerns. Despite numerous governmental and agency-led investigations pinpointing various causative factors, the role of frugal practices in these problems remains largely unexamined. Frugality, a virtue encompassing resource conservation and economic rationale, is significant to individuals and societies but is often misunderstood. While it involves voluntary restraint and sustainable choices, in construction, it may also lead to cutting corners, such as employing unqualified professionals and neglecting ethical standards, thereby compromising quality and safety (Argandoña, 2008; Aristotle, 2009; Daly, 2008). The prevalence of frugal practices in construction, aimed at minimizing costs, has been linked to compromised project quality. For instance, This is echoed by Amade (2015), who notes that many projects either fail or are abandoned mid-execution due to poor planning and execution. Oyedele (2013) further asserts that these practices often lead to schedule delays, cost overruns, and low-quality projects, with building collapses being a prominent issue in urban centres. The dual challenge of insufficient funding and the pursuit of cost-saving measures exacerbates these problems. When funds are inadequate, projects are delayed or abandoned, a phenomenon noted by Adebisi, Ojo, and Alao (2018). They identify inadequate client funding and contractor bankruptcy as key factors. On the other hand, frugal practices, such as inadequate planning and hiring unqualified professionals to cut costs, lead to project failures and stakeholder dissatisfaction.

Despite the critical role of frugal practices in construction outcomes, there is a lack of comprehensive research on their effects. Kaassers (2002) observes that the outcomes of frugal practices are under-researched, especially in the construction industry. Most studies on frugality focus on behavioral patterns and consumer

perceptions rather than its impact on construction project delivery (Li et al., 2019; Young, 2017; Lastovicka et al., 1999). Moreover, while there is substantial literature on project constraints and failure factors (Nakhleh, 2019; Rugenyi & Bwisa, 2016; Nzekwe et al., 2015; Osuizugbo, 2019), the specific influence of frugal practices on these aspects is seldom addressed. This study aims to fill this gap by investigating the factors responsible for the adoption of frugal practices and their effects on public building project delivery in Southwest Nigeria. Understanding these factors and their impacts is crucial for improving project outcomes and preventing the adverse effects associated with frugality in construction. The insights gained could guide stakeholders, including project managers, consultants, contractors, material suppliers, and clients, in making informed decisions that enhance project cost performance and overall success (Durdyev, 2020).

## 2. LITERATURE REVIEW

Factors Influencing Adoption of Frugal Practices

In the field of construction and project planning, professionals are frequently tasked with the challenge of maximizing resource utilization while balancing conflicting aspects of project delivery (Rezaian, 2011). In developing countries like Nigeria, the construction industry faces a myriad of challenges, as noted by Bala, Bello, Kolo, and Bustani (2009). One significant issue is the delay in payment, which often leads to project delays, as contractors are unable to continue the project using their own finances. This situation can result in projects being completed at costs higher than originally estimated, a view supported by Ogunsemi and Jagboro (2006) and Adeola (2011). In addressing sustainability and climate change, it is essential to adopt frugal practices that reduce consumption behaviours and maintain sustainable social practices (Suarez, Hernandez, Gil-Gimenez, & Corral-Verdugo, 2020). Frugal practices in innovation are crucial for resource-constrained environments, and Hossain et al. (2022) have developed a comprehensive framework that identifies the antecedents, mediators, and consequences of such practices. They categorize mediators into four broad classes: the innovation task, resource constraints, scalability constraints, and institutional constraints.

Innovation Task: Entrepreneurs need to engage in iterative experimentation and consider diverse strategies to develop frugal products (Hossain et al., 2022).

Resource Constraints: Entrepreneurs face challenges in accessing necessary resources, such as raw materials, skills, capital, and technologies. In response, they often resort to locally sourced alternatives or recycled materials (Hossain et al., 2022).

Scalability Constraints: Entrepreneurs find it difficult to scale their ventures despite the high potential for addressing unmet demands for basic services like housing, healthcare, and education (Hossain et al., 2022).

Institutional Constraints: The absence of supporting institutions, such as those providing start-up incubation, seed grants, and business services, poses significant challenges for frugal entrepreneurs in developing countries (Hossain et al., 2022).

Hossain (2020) also analyzed the triggers and motivations behind frugal practices, noting that successful outcomes are achieved when internal and external motivations align. Additionally, the diffusion of frugal innovations often occurs from low-income to high-income markets. Cai, Ying, Liu, and Wu (2019) studied the antecedents and consequences of frugal innovation from a resource-constrained perspective. They found that cost innovation and affordable value innovation positively impact the performance of emerging-market firms, particularly those with capabilities for institutional leverage and bricolage. Krohn, Petersen, and Herstatt (2019) conducted a systematic literature review and focus group discussions to identify key factors influencing frugal innovation in organizations. They identified 32 influencing factors, which were further refined through expert discussions. Ślęzak and Jagielski (2018) highlighted that frugal innovations manifest in various ways across different domains, including social, business, and technological innovations. They emphasized that frugal innovations should be valuable for customers and beneficial for companies and stakeholders. Hossain et al. (2021) categorized the antecedents of frugal innovation into personal, business, and societal drives. These drives motivate entrepreneurs to pursue frugal innovations to improve health and living standards, exploit business opportunities, and address social issues. Soni and Krishnan (2013) explored frugal innovation, identifying three types of frugal innovators: grassroots-level, domestic-enterprise

level, and MNC-subsidiary level. They found that factors like organizational benefits, creation of social value, and access to new markets positively affect frugal innovation. Pepper et al. (2009) examined the values motivating socially conscious and frugal consumer behaviours, finding that such behaviours are primarily driven by low personal materialism and income constraints.

## 3. METHODOLOGY

The study adopted a cross-sectional survey research design to collect primary data through questionnaires from construction professionals in public universities across Lagos, Ondo, and Osun States in Southwest Nigeria. A multi-stage sampling technique was used, starting with the purposive selection of states and universities, followed by stratified random sampling of 251 respondents from a population of 708 professionals, including architects, builders, quantity surveyors, and structural engineers. The questionnaire, divided into sections covering socio-demographic information and study variables, was validated through a pilot study and expert review to ensure reliability and accuracy. Data analysis was performed using Partial Least Square-Structural Equation Modelling (PLS-SEM) to explore the relationships between variables.

## 4. RESULTS AND DISCUSSION

### 4.1 Demographic Characteristics of Respondents

Table 4.1 shows the demographic characteristics of the respondents. The table revealed the distributions of respondents across different locations, genders, professions, types of construction projects executed, positions on projects, educational qualifications, years of experience, professional groups, and the adoption of frugal practices. Understanding the demographic characteristics of respondents provides insights into their perceptions and experiences with respect to frugal practices and cost reduction strategies. Table 4.1 further shows the distribution of the respondents across different locations in the Southwest region of Nigeria, with the highest representation from Ondo 75 (or 37.1%) followed by Osun 65 (or 32.2%) and Lagos 62 (or 30.7%),). This distribution ensures a representative sample from various locations within the study area, which enhanced the study's validity. Similarly, the gender distribution of the respondents revealed that the majority were male (or 86.1%), while females constituted a smaller percentage (or 13.9%). It was not surprising as the male gender dominated the building construction industry due to the nature of work. This agrees with the findings of Dim *et al., (*2018) that men are the most dominant workers in the construction industry. This implies that construction industry workers are dominated by males in Southwest Nigeria. The table also shows that most of the respondents belonged to various professional associations relevant to the construction industry. These included architects (30.2%), builders (28.73%), quantity surveyors (26.7%), and structural engineers (14.4%). This diversity of professions ensures a multifaceted view of frugal practices in public building projects. A majority of the respondents (73.8%) reported their involvement in building projects, while

Table 4.1: Demographic Characteristics of Respondents

| Demographic Variables | Options | Frequency | Percentage |
|---|---|---|---|
| Location | Lagos | 62 | 30.7 |
| | Ondo | 75 | 37.1 |
| | Osun | 65 | 32.2 |
| | Total | 202 | 100.0 |
| Gender | Male | 174 | 86.1 |
| | Female | 28 | 13.9 |
| | Total | 202 | 100.0 |
| Type of Profession | Architect | 61 | 30.2 |
| | Builder | 58 | 28.7 |
| | Quantity Surveyor | 54 | 26.7 |
| | Structural Engineer | 29 | 14.4 |
| | Total | 202 | 100.0 |
| Type of Construction Projects Executed | Building project | 149 | 73.8 |
| | Building and Civil Engineering projects | 39 | 19.3 |
| | Civil Engineering project | 14 | 6.9 |
| | Total | 202 | 100.0 |
| Position on the Project | Contractor | 75 | 37. 1 |
| | Professional | 127 | 62.9 |

| | | | |
|---|---|---|---|
| | Total | 202 | 100.0 |
| | | | |
| Highest Educational Qualification | ND/NCE Tech | 0 | 0 |
| | HND | 30 | 14.9 |
| | PGD | 33 | 16.3 |
| | BSc/B.Tech/B.Eng | 74 | 36.6 |
| | MSc | 45 | 25.3 |
| | PhD | 14 | 6.9 |
| | Total | 202 | 100.0 |
| Years of Experience | 1-10 | 29 | 14.3 |
| | 11-20 | 89 | 44.1 |
| | 21-30 | 58 | 28.7 |
| | 31-40 | 26 | 12.9 |
| | 41-50 | 0 | 0 |
| | Total | 202 | 100.0 |
| Professional Level of Respondents | Associate | 38 | 18.8 |
| | Graduate | 50 | 24.8 |
| | Corporate | 103 | 50.9 |
| | Fellow | 11 | 5.5 |
| | Total | 202 | 100.0 |

Source: Field Survey, 2024

(12.3%) worked on both building and civil engineering projects, and (6.9%) focused solely on civil engineering projects.This information is crucial as it reflects the nature of projects the respondents were engaged in, which may influence their exposure to frugal practices. The respondents' positions on projects they were involved in varies. Some were contractors (50.5%), some and the majority identified as professionals (66.2%). This breakdown is important because it highlights the diverse roles and responsibilities of individuals engaged in public building projects. The educational qualifications of the respondents range from lower levels, such as ND/NCE Tech (0.0%) and HND (14.9%), to higher levels, including PGD (16.3%), BSc/B.Tech/B.Eng (36.6%), MBA/MSc/M.Tech (25.3%), and PhD (6.9%). This diversity in educational background seems to influence their understanding and decision-making regarding frugal practices. The respondents' years of experience in building projects delivery span different ranges. The majority have 1-10 years of experience (14.3%), followed by those with 11-20 years (44. 1%), 21-30 years (28.7%), 31-40 years (12.9%), and 41-50 years (0.0%). The findings highlight the experience levels within the respondent pool, which may have impacted their knowledge and adoption of frugal practices. The professional group affiliation of respondents includes associates (18.8%), graduates (24.8%), corporate members (50.9%), and fellows (5.5%). This background information provides insights into their professional affiliations and their potential exposure to industrial practices and standards, thereby, enabling them to adequately responded to the questionnaires.

4.2 Effect of Factors influencing Adoption of Frugal Practices on Public Building Projects Delivery in the Study Area

4.2.1 Measurement Model for Factors Responsible for Adoption of Frugal Practices on Public Building Projects Delivery

For the objective of the study, in order to ascertain the effect of the sub-constructs' frugal practices adoption factors and public building projects delivery among public universities with Lagos, Ogun, and Osun State Nigeria, the study considered the use of path analysis as used in the second objective. This involved ascertaining the quality of data obtained from the survey by conducting the measurement model. For this objective, the algorithm for the reflective construct was considered. The examination of the measurement quality for a reflective model involved assessment of construct reliability, validity, and discriminant validity based on the guidelines proposed by Hair et al (2019). The variables under consideration comprise the exogenous constructs of frugal practices adoption factors with 9 indicators and classified into FactorA ((factA) with items fact1,2,6,7 &8 and FactorB (factB) with items fact3,4,5&9; and the endogenous sub-constructs of projects delivery which comprises 3 constructs and 19 indicators. The variables include cost performance (fCost) with items eff6,8,9,11,15,17,18 and 19; time/schedule (fTime) with items eff1,2,4,710,12,14, and16; and client satisfaction (fSatisfaction) with items eff3,13&15. Table 4.2 shows that the construct reliability and validity, measured using Cronbach's Alpha (CA), surpassed the recommended threshold of 0.7 following the

criteria outlined by Hair et al. (2019). Table 4.2 shows the composite reliability values ranging from 0.856 to 0.922, exceeding the threshold value of 0.7 suggested by Hair et al. (2019). Table 4.2 also presented the average variance extracted (AVE) values for each construct, ranging from 0.548 to 0.666, thus surpassing the threshold value of 0.50 considered desirable, indicating that the construct explains more than half of the variance in its indicators (Hair et al., 2019). In this study, the AVE values were deemed satisfactory, affirming the convergent validity on the construct level.

Table 4.2 Construct reliability and validity Factors Responsible for Adoption of Frugal Practices and Project Delivery

| | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | Average variance extracted (AVE) |
|---|---|---|---|---|
| FCost | 0.900 | 0.903 | 0.920 | 0.590 |
| fSatisfaction | 0.749 | 0.766 | 0.856 | 0.666 |
| FTime | 0.903 | 0.909 | 0.922 | 0.599 |
| FactA | 0.836 | 0.854 | 0.878 | 0.548 |
| FactB | 0.831 | 0.844 | 0.888 | 0.665 |

**Source:** Field Survey, 2024

The study conducted a thorough assessment of discriminant validity in order to measure the distinct nature of each construct from others within the model, to affirm its uniqueness of individual constructs. Cross-Loadings, the Fornell-Larcker criterion, and the heterotrait-monotrait ratio (HTMT) of correlations were utilized for this assessment. The Cross-Loadings criteria required that each indicator's outer loading on its associated construct should surpass any cross-loading on other constructs within the model. The findings presented in Table 4.3 confirmed the fulfilment of this criterion, indicating the distinctiveness of each construct. The Fornell–Larcker criterion compared the square root of each construct's Average Variance Extracted to its highest correlation with any other construct. As demonstrated in Table 4.4, this criterion was met, further supporting the distinctiveness of the constructs. The HTMT ratio, recognized as a superior method for discriminant validity assessment, was employed. This ratio represents the between-trait correlations of the constructs. Based on the threshold values proposed by Henseler et al. (2015), values exceeding 0.90 indicate a lack of discriminant validity. However, a more conservative threshold of 0.85 or lower is recommended for constructs that are conceptually more distinct. Table 4.5 displayed the HTMT results, revealing that none of the construct values surpassed 0.90, thereby meeting the quality criteria for outer measurements and first order in the model. The HTMT results, therefore, concluded that the quality criteria for outer measurements were met.

Table 4.3 Cross loadings for Factors Responsible for Adoption of Frugal Practices and Project Delivery

| | fCost | fSatisfaction | fTime | factA | factB |
|---|---|---|---|---|---|
| eff1 | 0.489 | 0.437 | 0.713 | 0.438 | 0.522 |
| eff10 | 0.657 | 0.520 | 0.769 | 0.411 | 0.462 |
| eff11 | 0.798 | 0.550 | 0.552 | 0.576 | 0.376 |
| eff12 | 0.700 | 0.566 | 0.843 | 0.517 | 0.565 |
| eff13 | 0.659 | 0.854 | 0.562 | 0.604 | 0.450 |
| eff14 | 0.508 | 0.446 | 0.865 | 0.340 | 0.637 |
| eff15 | 0.777 | 0.524 | 0.538 | 0.601 | 0.488 |
| eff16 | 0.654 | 0.501 | 0.815 | 0.480 | 0.636 |
| eff17 | 0.830 | 0.492 | 0.473 | 0.666 | 0.415 |
| eff18 | 0.793 | 0.511 | 0.484 | 0.666 | 0.355 |
| eff19 | 0.777 | 0.432 | 0.596 | 0.604 | 0.445 |
| eff2 | 0.417 | 0.518 | 0.713 | 0.383 | 0.599 |
| eff3 | 0.480 | 0.841 | 0.662 | 0.429 | 0.588 |
| eff4 | 0.391 | 0.409 | 0.736 | 0.226 | 0.493 |
| eff5 | 0.475 | 0.749 | 0.304 | 0.511 | 0.228 |
| eff6 | 0.678 | 0.537 | 0.524 | 0.569 | 0.282 |
| eff7 | 0.482 | 0.552 | 0.718 | 0.282 | 0.486 |
| eff8 | 0.708 | 0.457 | 0.596 | 0.522 | 0.336 |
| eff9 | 0.773 | 0.610 | 0.558 | 0.537 | 0.400 |
| fact1 | 0.445 | 0.400 | 0.269 | 0.650 | 0.381 |

| | | | | | |
|---|---|---|---|---|---|
| fact10 | 0.524 | 0.501 | 0.335 | 0.776 | 0.433 |
| fact2 | 0.415 | 0.348 | 0.263 | 0.692 | 0.451 |
| fact3 | 0.331 | 0.355 | 0.476 | 0.397 | 0.737 |
| fact4 | 0.340 | 0.384 | 0.587 | 0.325 | 0.836 |
| fact5 | 0.457 | 0.480 | 0.642 | 0.477 | 0.879 |
| fact6 | 0.750 | 0.586 | 0.493 | 0.835 | 0.354 |
| fact7 | 0.590 | 0.435 | 0.357 | 0.746 | 0.415 |
| fact8 | 0.623 | 0.485 | 0.451 | 0.727 | 0.314 |
| fact9 | 0.495 | 0.484 | 0.616 | 0.467 | 0.802 |

**Source:** Field Survey,2024

Table 4.4 Fornell-Larcker criterion Factors Responsible for Adoption of Frugal Practices and Project Delivery

| | fCost | fSatisfaction | fTime | factA | factB |
|---|---|---|---|---|---|
| FCost | 0.768 | | | | |
| fSatisfaction | 0.667 | 0.816 | | | |
| FTime | 0.699 | 0.638 | 0.774 | | |
| FactA | 0.775 | 0.633 | 0.505 | 0.740 | |
| FactB | 0.506 | 0.529 | 0.718 | 0.516 | 0.815 |

Source: Researcher's Field Report (2024)

Table 4.5 Heterotrait-monotrait ratio (HTMT) Factors Responsible for Adoption of Frugal Practices and Project Delivery

| | fCost | fSatisfaction | fTime | factA | factB |
|---|---|---|---|---|---|
| FCost | | | | | |
| fSatisfaction | 0.807 | | | | |
| FTime | 0.778 | 0.760 | | | |
| FactA | 0.865 | 0.781 | 0.553 | | |
| FactB | 0.574 | 0.647 | 0.815 | 0.630 | |

Source: Field Survey,2024

4.2.2 Structural Path Analysis of Factors Responsible for Adoption of Frugal Practices on Public Building Projects Delivery

The analysis of path coefficients of the disaggregated factors responsible for adoption of frugal practices and project delivery sub-constructs in Table 4.6 and Figure 4.1 and 4.2 aligns with the criteria proposed by Hair et al. (2019) to ascertain statistical significance, where a P-value less than or equal to 0.05 and a T-value greater than or equal to 1.96 (at 95%) are considered significant. In the context of the analysis presented, a relationship between an independent variable and a dependent variable is also considered to be significant at 90% when T-statistics falls within a range where it is greater than or equal to 1.65, and the associated P-value is greater than 0.05 but less than 0.1. This indicates a moderate level of statistical significance. This approach allows the researcher to examine the relationships between various frugal practices adoption factors and public building project delivery among public universities in Southwest, Nigeria. In assessing collinearity of the inner model, a key consideration was the Variance Inflation Factor (VIF). According to the guidelines by Hair et al. (2017), VIF values are ideally expected to be below 3.0 for conservative measures and not exceeding 0.5 for more stringent criteria. Table 4.26 presented findings indicating that all the inner VIF value observed was 1.362, which affirms that collinearity was not a concern, as all VIF values were within the acceptable range. Table 4.6 presents the path coefficients for the relationships between factors responsible for adoption of frugal practices and disaggregated project delivery sub-constructs. The path coefficients, beta values, T statistics, and P values are utilized to assess the strength and significance of these relationships. The results indicate significant relationships between factors responsible for the adoption of frugal practices and the disaggregated project delivery sub-constructs in public universities in Southwest Nigeria. Starting with the path coefficients, it is observed that all six paths exhibit statistically significant relationships.

For instance, the path coefficient (Beta) for the relationship between factor A and cost performance (fCost) is 0.701, with a T statistic of 14.851 and a p-value of 0.000. This indicates a strong positive relationship between factor A and cost performance. Similar significant relationships are observed for factor A with satisfaction (fSatisfaction) (factA -> fSatisfaction, Beta =0.490, T Statistics = 10.796), and time/schedule (fTime) (factA -> fTime, Beta = 0.183, Tstatistics = 2.032), as well as for factor B with fCost (factB -> fCost, Beta =0.145, T Statistics =2.045), fSatisfaction (factB -> fSatisfaction, Beta =0.276, T statistics =3.374), and fTime (factB -> fTime, Beta = 0.624, T statistics = 6.829).

Moving to Table 4.7 Figure 4.3 and 4.4, which present the path coefficients for factors responsible for adoption of frugal practices and aggregated project delivery, both paths are significant. Factor A exhibits a higher path coefficient (Beta = 0.528, T Statistics = 10.996) compared to factor B (Beta = 0.387, T Statistics = 4.932). This suggests that factor A has a stronger influence on aggregated project delivery, with cashflow challenges (fact6) emerging as the most impactful indicator within this construct. Considering R-square values, based on the study of Cohen (1992), as reported in Tehseen *et al.*, (2019), it was suggested that $R^2$ values of 0.26, 0.13 and 0.02 should be considered as substantial, moderate and weak respectively. The model demonstrates substantial explanatory power. The factors responsible for adoption (A and B) explains 64% of the variance in project delivery, with cashflow challenges playing a significant role. Regarding effect sizes (f-square), based on the threshold by Cohen (1992) the values of the f-square effect size 0.02, 0.15 and 0.35 are considered as small, medium and large significant effects of the exogenous constructs respectively. Both factors A and B exhibit significant effects. Factor A's large significant effect (f-square = 0.569) underscores the importance of addressing cashflow challenges and factors of frugal practices for improved project delivery. Meanwhile, factor B's effect size, though smaller (0.305), still suggests a large effect on project delivery.

Table 4.6 Path coefficients Factors Responsible for Adoption of Frugal Practices and Disaggregated Project Delivery sub-constructs

| | Beta | SD | T statistics | P values | VIF |
|---|---|---|---|---|---|
| factA -> fCost | 0.701 | 0.047 | 14.851 | 0.000 | 1.362 |
| factA -> fSatisfaction | 0.490 | 0.045 | 10.796 | 0.000 | 1.362 |
| factA -> fTime | 0.183 | 0.090 | 2.032 | 0.042 | 1.362 |
| factB -> fCost | 0.145 | 0.071 | 2.045 | 0.041 | 1.362 |
| factB -> fSatisfaction | 0.276 | 0.082 | 3.374 | 0.001 | 1.362 |
| factB -> fTime | 0.624 | 0.091 | 6.829 | 0.000 | 1.362 |

Source: Field Survey, 2024

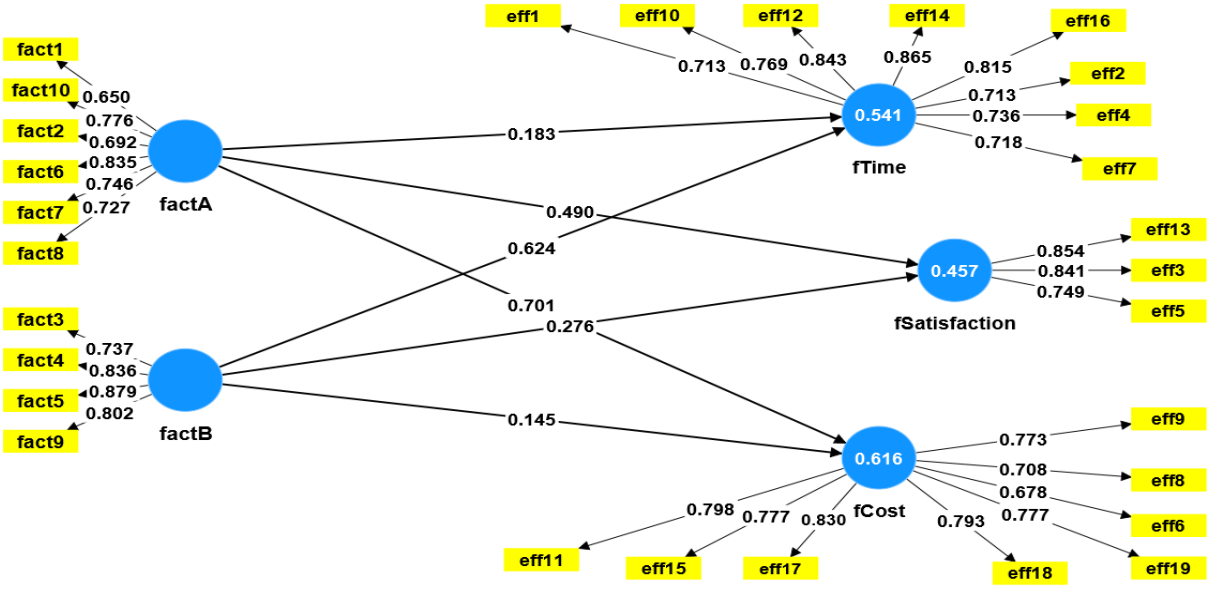


Figure 4.1 Algorithm for Disaggregated Factors Responsible for Adoption of Frugal Practices and Project Delivery

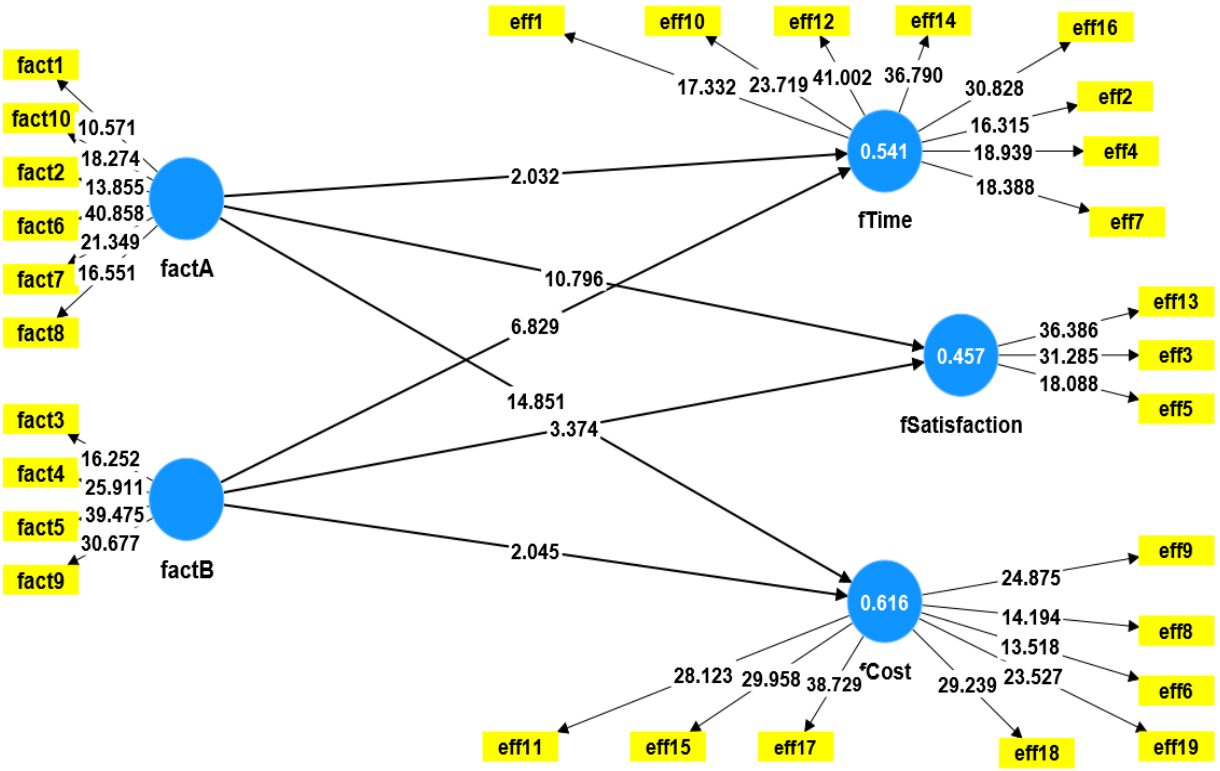


Figure 4.2 Bootstrapping for Disaggregated Factors Responsible for Adoption of Frugal Practices and Project Delivery

Table 4.7 Path Coefficient for Factors Responsible for Adoption of Frugal Practices and Aggregated Project Delivery

| Path | Beta | SD | T statistics | P values | VIF | f-square | R-square |
|---|---|---|---|---|---|---|---|
| factA -> Project Delivery | 0.528 | 0.048 | 10.996 | 0.000 | 1.363 | 0.569 | 0.640 |
| factB -> Project Delivery | 0.387 | 0.078 | 4.932 | 0.000 | 1.363 | 0.305 | |

Source: Field Survey, 2024

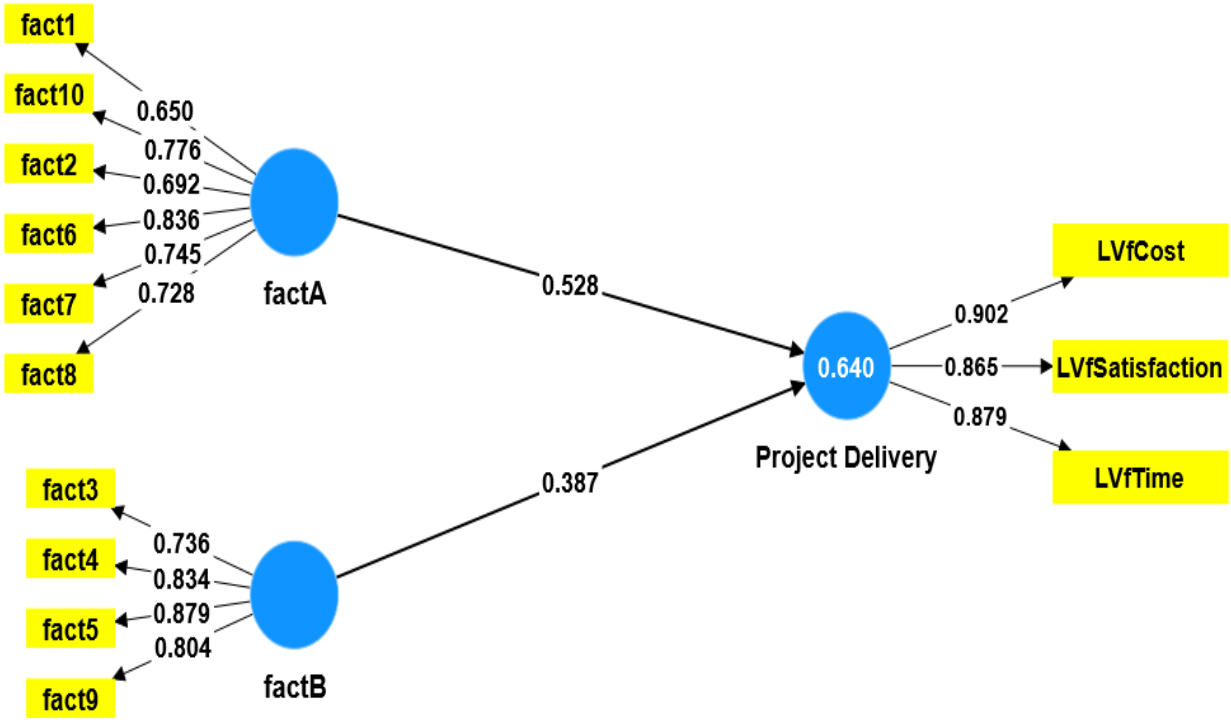


Figure 4.3 Algorithm for Factors Responsible for Adoption of Frugal Practices and Aggregated Project Delivery

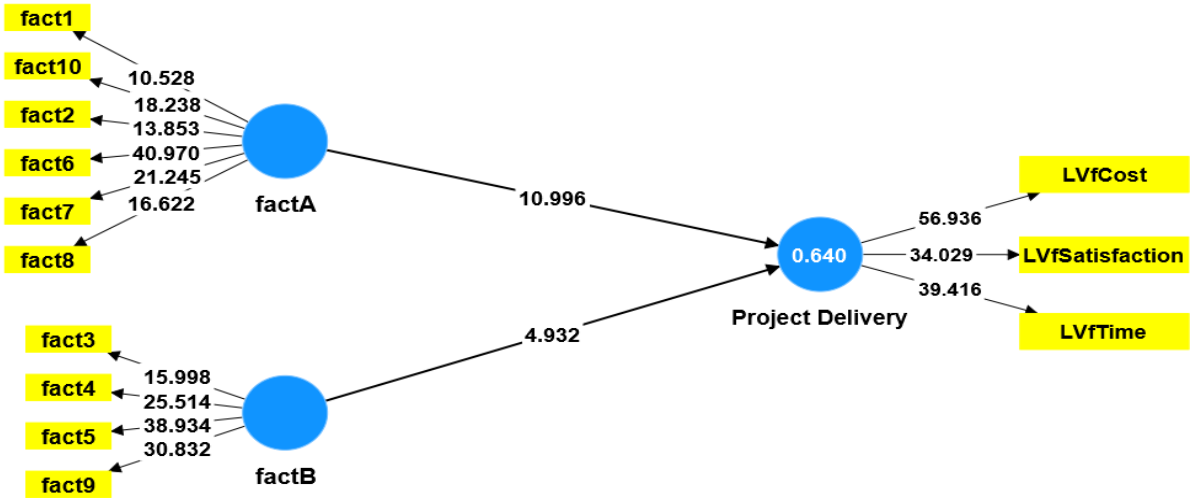


Figure 4.4: Bootstrapping for Factors Responsible for Adoption of Frugal Practices and Aggregated Project Delivery

These findings underscore critical implications. Cashflow challenges, highlighted by factor A, emerge as a central impediment affecting project delivery within public universities. Addressing these challenges can significantly enhance cost performance, satisfaction, and adherence to project timelines. Stakeholders must prioritize initiatives aimed at mitigating cashflow challenges and other frugal practices to bolster overall project delivery efficiency and effectiveness. Effective management strategies, such as optimizing resource allocation and financial planning, are imperative to navigate cashflow challenges and ensure smooth project execution within public university settings.

The findings of this study corroborate with findings from previous studies in the literature. For instance, Oyeyipo and Ojelabi (2021) investigated impact of frugal practices, including locally sourced materials and cost-saving measures, on construction project performance in Nigeria. The findings support the significant influence of frugal practices on various project delivery aspects, aligning with the results indicating strong relationships between frugal practices adoption factors and project delivery sub-constructs. Afolabi et al. (2019) research explored the application of frugal innovation in housing delivery in Nigeria, focusing on cost-effective strategies and locally sourced materials. The findings emphasize the importance of addressing challenges like cashflow constraints and material shortages, supporting the significance of factors such as cashflow challenges (fact6) in influencing project delivery, as highlighted in the present study. Fagbenle et al. (2020) examined the influence of contractors' bidding strategies, including the preference for the lowest bidder, on project performance in Nigeria. The findings resonate with the present study's results, highlighting the significant relationship between intention to award contracts to the lowest bidder (factorA) and project delivery sub-constructs, particularly cost performance and satisfaction. Moreover, Olawale and Sun (2017) assessed factors affecting cost and time control in construction projects, providing insights into challenges like cashflow constraints and material shortages. The findings support the importance of addressing such factors to enhance project delivery efficiency, aligning with the implications drawn from the present study's results.

## 5. CONCLUSION AND RECOMMENDATION

This study was carried out to determine the factors influencing adoption of frugal practices in Public Building Projects Delivery in Southwest, Nigeria. The study examined the measurement model for all constructs and indicators, and the subsequent structural model for disaggregated and aggregated factors. The measurement model assessment involved construct reliability, validity, and discriminant validity. Construct reliability and validity were generally satisfactory, with Cronbach's Alpha (CA) and Composite reliability (CR) values surpassing threshold values. The average variance extracted (AVE) values confirmed the convergent validity. Discriminant validity was affirmed through cross-loadings, the Fornell-Larcker criterion, and heterotrait-monotrait ratio (HTMT) of correlations, meeting established

criteria. The structural model assessment included collinearity checks and analysis of path coefficients, coefficient of determination (R-square), and effect size (f-square). Findings from the structural path analysis reveal that cashflow challenges emerge as a significant factor influencing project delivery, with substantial explanatory power. Factors responsible for adoption, represented by path coefficients, explain a considerable portion of the variance in project delivery outcomes. For instance, factor A exhibits a higher path coefficient ($\beta = 0.528$) compared to factor B ($\beta = 0.387$), suggesting the stronger influence of factor A on aggregated project delivery. These findings underscore the need to address cashflow challenges and factors of frugal practices to enhance project delivery efficiency.

To address cashflow challenges and factors responsible for the adoption of frugal practices, stakeholders should implement measures to enhance financial planning and management. Strategies such as securing project funding in advance, establishing transparent budgeting processes, and negotiating favorable payment terms with suppliers can help mitigate cashflow constraints.

Future studies could investigate the influence of external factors, such as economic conditions and regulatory frameworks, on the adoption of frugal practices in the construction industry. By examining how macroeconomic trends and regulatory changes impact decision-making processes within construction firms, researchers can better understand the broader context in which frugal practices are implemented. This would provide valuable insights into the external pressures and incentives that drive the adoption of sustainable and cost-effective construction practices.

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