CHAPTER III
RESEARCH METHODS

The research methodology provides a framework for examining the relationships between budget-related practices, revenue management procedures, e-procurement systems within IFMIS in Ghana, financial transparency, and accountability, and how economic factors and digital infrastructure moderate these relationships in the local government of Ghana. This methodical strategy includes research design, participants, population and sampling, research instrument, research procedures, data analysis, and ethical considerations. This research methodology aims to contribute to the field of PFM by shedding light on the financial management practices of Ghana's local government.

3.1 Research Design

This study adopts a quantitative approach, incorporating a factorial experimental design alongside a cross-sectional survey methodology. A factorial experimental design allows the simultaneous manipulation of two or more independent variables (factors) to examine their impact on a dependent variable (Creswell, 2014). This approach enables the study to explore how budgetary practices, revenue management procedures, and electronic procurement systems, key components of IFMIS, interact to influence financial transparency and accountability in Ghana’s local government.

The research employed a cross-sectional survey to evaluate the impact of IFMIS on financial transparency and accountability. This methodology aligns with the study's objectives by providing a comprehensive snapshot of the relationships among economic variables, digital infrastructure, and IFMIS functionalities at a specific point in time. The cross-sectional approach collects data from respondents simultaneously, enabling an analysis of current activities, perceptions, and interactions between key variables without requiring prolonged observation. This method effectively uncovers patterns and correlations within the research timeframe (Van der Stede, 2014).

From a practical standpoint, the cross-sectional survey design is resource-efficient and time-effective compared to longitudinal investigations. It facilitated

data collection from all 261 MMDAs in Ghana within a constrained timeframe. The large population base ensured diverse perspectives, providing a comprehensive and generalizable understanding of IFMIS implementation across regions with varying levels of economic development and infrastructure quality (Weyant, 2022). The design's focus on assessing moderating variables, such as economic factors and digital infrastructure, further underscores its suitability. By collecting data from regions with differing economic conditions and digital capabilities, the cross-sectional survey effectively identified correlations and interactions among factors. This approach highlighted the immediate influence of moderating variables on financial transparency and accountability without requiring extended data-collection periods (Babbie, 2020).

Alternative strategies, such as longitudinal or mixed-methods approaches, were deemed less appropriate for this study. While longitudinal designs are effective for monitoring temporal changes, they are resource-intensive and time-consuming, making them impractical given the study's focus on current dynamics. Moreover, longitudinal studies may not provide actionable insights into the immediate challenges and opportunities faced by local governments in optimizing IFMIS implementation (Cohen et al., 2017). The study prioritized hypothesis testing and structural analysis using Partial Least Squares Structural Equation modelling (PLS-SEM) over mixed-methods approaches, which integrate quantitative and qualitative data. The focus on statistical generalizability reinforced the choice of a survey-based quantitative approach.

The factorial experimental design enhanced the study by enabling an examination of the interactions among budgetary practices, revenue management, e-procurement, financial transparency, and accountability. This design facilitated the quantification of these variables, allowing statistical analyses to reveal causal relationships (Montgomery, 2017). Quantitative data collection methods, such as surveys, questionnaires, and structured observations, were utilized to ensure robust data acquisition. Advanced statistical techniques, such as multiple regression analysis, were employed to investigate the moderating effects of economic factors and digital infrastructure, providing a nuanced understanding of the study's themes (Schäfer et al., 2017).

PFM in Ghana's local government presents a complex yet critical area of study. Using both a cross-sectional survey and a factorial experimental design together helps the study's main goals and lets researchers look into a lot of factors that are connected. When real data was combined with advanced analytical tools, it was possible to learn a lot about how budgeting, managing revenues, and e-procurement in IFMIS affect financial security and accountability. The analysis also sheds light on the moderating influence of economic factors and digital infrastructure, contributing to a deeper understanding of the intricate dynamics at play (Mikalef et al., 2019).

3.2 Participants

In the research community, participants refer to those who take part in a study by contributing data, information, or viewpoints beneficial to the research objectives. Participants were essential to the research process because they provided the vast majority of the data that was analyzed and interpreted to produce results (Nardi, 2018; Sutton & Austin, 2015).

Ghana’s local government system is three-tiered, originated with PNDC Law 207, and was subsequently revised in the 1992 Constitution and Local Government Act, 462 of 1993 (presently referred to as the Local Governance Act, 936 of 2016) (Boateng, 2017). These structures operate at the subdistrict, district, and regional levels, according to the NDPC (2000) (Mensah, 2005). The first tier consists of Regional Coordinating Councils (RCCs), followed by Metropolitan Municipal and District Assemblies (MMDAs) as the second tier, and lastly, Unit Committees and Urban, Town, Zonal, or Area Councils as the third tier, respectively. The second stratum, however, was the focus of this investigation: the MMDAs. Under the Local Governance Act 936 of 2016, MMDAs have been granted authority as the center of local administration in Ghana. Local governments, demographics, and settlement characteristics all contribute to this empowerment.

There are currently 261 MMDAs in Ghana, which represent the core of Ghana’s local government (Ghana Statistical Service, 2021). The MMDAs of Ghana are responsible for providing essential public services and governance at the grassroots level. Therefore, the 261MMDAs participated in this study as it seeks to

provide a comprehensive and exhaustive understanding of financial transparency and accountability practices within the local government of Ghana.

Each of Ghana's 261 MMDAs was represented in this study, and their distinctive characteristics are essential to comprehending their function. Examples of such elements include diversity in geography, administration, resources, local governance practices, the economy, and society. The financial transparency and accountability practices of MMDAs differ greatly based on several variables, the majority of which could only be comprehended by examining each local government in detail. The diversity of viewpoints presented here guarantees a comprehensive examination of the study issue and its implications for municipal administration. This study shed light on the dynamics of financial transparency and accountability in the context of local government by conducting interviews with participants from each of Ghana's 261 MMDAs. Due to the diversity of the study's participants in terms of geography, organizational composition, financial resources, and leadership styles made it possible to gain a deeper understanding of the issue.

3.3 Data Collection Procedure

The study employed a cross-sectional survey methodology to analyze financial transparency and accountability practices across the MMDAs. The data collection tools were tailored, such as structured questionnaires, to capture key themes like budgetary practices, revenue management, and digital infrastructure. The design and execution of these tools adhered to established public administration research protocols (Creswell, 2014). Data were collected through a structured, self-administered questionnaire that was developed based on validated constructs from the literature, as outlined in Section 2.2.4 and detailed in Table 3.1. Before the main data collection, the questionnaire was pre-tested with five MMDAs selected from different regions. Feedback from the pre-test helped refine the clarity, relevance, and structure of the questionnaire. Adjustments were made to language, sequence, and item wording to ensure clarity and consistency across all local government contexts (Doody & Doody, 2015).

Given the geographic dispersion of the MMDAs and the requirement for cost-effective, fast, and uniform data collection, the questionnaire was made

available online using Google Forms. This digital strategy improved accessibility across all areas, enabling real-time monitoring of submissions and reduced data input mistakes. The survey link was sent electronically through WhatsApp to MMDAs representatives. Each MMDA was supposed to organize an internal reaction by offering information via its management team or selected individuals who were familiar with its financial management procedures.

Stakeholder engagement was a critical component of the data collection process. Management within the MMDAs was directly involved, and each MMDA answered one questionnaire, ensuring that responses were accurate and comprehensive. This collaboration also facilitated the assessment of economic variables and digital infrastructure, key factors influencing financial management practices (Tetteh et al., 2021). To improve the completeness and timeliness of responses, follow-up reminders were sent to all MMDAs at regular intervals over two weeks. These reminders were communicated through phone calls. The data collection period spanned two months, and by the end of the period, 30th June 2024, a total of 261 valid responses were obtained from the MMDAs.

The comprehensive census approach provided a detailed and nuanced understanding of financial transparency and accountability within Ghana's local government framework. By including all 261 MMDAs, the study accurately reflected the governance structures, infrastructural capacities, and operational practices of local government institutions. The results were reliable and could be used for the whole MMDA population because they included geographical diversity, proportional representation, and stratified methods. The adoption of pilot testing, stakeholder participation, and rigorous quality assurance processes strengthened the credibility of the results. These measures reduced bias, increased data reliability, and provided a solid foundation for evidence-based policy recommendations. The representativeness of the study's findings makes them valuable for improving local governance processes, fostering financial transparency, and reinforcing accountability across all MMDAs.

3.4 Population and Sampling Techniques

Casteel and Bridier (2021) define a population as the entire group of individuals, objects, or entities under study, allowing for the generalization of research findings. In this study, the population consists of all 261 MMDAs in Ghana. We assessed the levels of financial transparency and accountability of these assemblies, which represent the broader framework of local government institutions. Unlike sampling, which involves selecting a subset of a population (Etikan et al., 2016), this study adopted a census approach. A census involves collecting data from the entire population to achieve a comprehensive analysis (Fetters & Molina-Azorin, 2017). This methodology allowed the study to examine all 261 MMDAs exhaustively, reducing bias and ensuring the generalizability of findings.

The census approach, though resource-intensive and time-consuming, enabled the study to capture the full scope of financial transparency and accountability across Ghana's local government framework. All 261 MMDAs were included, encompassing diverse regions and administrative types. This ensured the inclusion of urban, peri-urban, and rural assemblies, representing the unique socioeconomic, infrastructural, and governance attributes of Ghana’s 16 regions (Ghana Statistical Service, 2021). A proportional representation of these categories was maintained to ensure alignment with Ghana's administrative framework. This approach allowed for the documentation of differences in resource availability, governance capacity, and digital infrastructure across the various assemblies (Ghana Statistical Service, 2021).

3.5 Research Instruments

An essential piece of apparatus used to meticulously capture data throughout a study is a research instrument (Malmqvist et al., 2019). This study's primary data collection instrument was a structured questionnaire that had been modified to meet the study's primary objectives. These questionnaires were the primary method of data acquisition from the study's participants. The questionnaire for this study adhered to a strict structure, with an emphasis on closed-ended

questions. In this design, respondents were given options from which to choose while responding to queries, thereby granting them assistance.

The questionnaire was divided into two sections, each serving a distinct purpose. The first section of the questionnaire was used to capture demographic information about the study participants. This section provided information on the responders' identities, locations, and other characteristics of the MMDAs in Ghana. In contrast, the second section of the survey zeroed in on the central factors of the investigation. The dependent variable is financial transparency and accountability, while the independent variables are budget-related practices, revenue management procedures, techniques, and e-procurement systems. In addition, the moderating variables, economic factors, and digital infrastructure will be discussed in this section.

The questionnaire employed a ratio, Likert scale, and binary scale to collect precise data and permitted nuanced responses. This scale ranged from "strongly disagree" to "strongly agree," for the Likert scale, 1 = 0-25%; 2 = 26%-50%; 3 = 51%-75%; 4 = 76%-100% for the ratios, and Yes or No for the binary scale, provided participants with a different means of conveying their thoughts and sentiments on the many factors of the study. The reliability and consistency of the data acquired were crucial to the validity of the study's findings; therefore, a structured questionnaire is essential.

3.5.1 Validity and Reliability of Research Instruments

Testing the validity and reliability of research instruments was of the utmost importance because it determines how much weight to give a study's results. Mohajan (2017) defines validity as the extent to which the selected research instrument assesses the targeted components. This guiding principle is essential because it ensures that the questionnaire data accurately reflects the variables of budgetary practices, revenue management procedures, e-procurement systems, financial transparency, and accountability within Ghana's local government. Two categories of validity, topic validity and construct validity, were used to conduct a comprehensive evaluation of the reliability and veracity of the data.

Examining whether the research instrument adequately encompasses the topics or structures investigated is what is meant by "topic validity," which was a subset of the larger evaluation of validity. Experts in public finance management conducted a comprehensive analysis of the research instrument to ensure its applicability to the subject of the study. These experts assessed whether the survey adequately captures the numerous research variables. To ensure that the research instrument closely aligns with the study's objectives and effectively obtains the desired information, their participation and feedback were crucial (Yeong et al., 2018).

A research instrument's construct validity evaluates how well it measures the constructs or concepts of interest. The objective of this study is to determine if the questionnaire was a valid instrument for evaluating the hypothesized relationships between local government budget-related practices, revenue management procedures, e-procurement, financial transparency, and accountability. The validity of the construct was evaluated using Confirmatory Composite Analysis (CCA). CCA is a potent statistical technique for investigating the subcomponents and interconnections of a research instrument. CCA is applied to the questionnaire data to determine conclusively whether the proposed constructs are precisely assessed and whether the measurement model is consistent with the theoretical framework (Spector et al., 2019).

The reliability of a research instrument is another essential factor to consider when assessing its quality (Spector et al., 2019). In this investigation, the test-retest method was used to ascertain the instrument's reliability. In this method, the same questionnaire was administered twice to a subset of respondents, separated by one week. Next, the Pearson correlation coefficient was used to compare and contrast the similarities and differences between the two sets of results. For the validity of the research instrument to be demonstrated, the Pearson correlation coefficient must be at least 0.70. Bolarinwa (2015) states that repeated administration of the same questionnaire to the same sample of respondents should yield analogous results, establishing the validity of the data.

For the success of this study, it is crucial to ensure the validity and dependability of the research instrument. Using both topic and construct validity

evaluations as well as the test-retest procedure, the research instrument will be rigorously tested to ensure that it encompasses the requisite constructs and consistently yields consistent results. This methodical approach strengthens the study's foundation, thereby making the findings more credible.

3.5.2 Measurement of variables

Table 3. 1 Measurement of Variables

Variable and Source	Indicator	Notations	Definition	Measurement	Scale
Budget-Related Practices (BRP) (Nabieu et al., 2021)	Budget formulation and execution	BRPe	The effectiveness of budget planning and execution within local government	Evaluate the effectiveness of budget planning and execution (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
	Compliance with fiscal rules	BRPc	The extent to which local governments adhere to fiscal rules and regulations	Evaluate the compliance on fiscal rules (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
	Budget transparency	BRPt	The level of transparency in local government budgetary processes	Evaluate the level of transparency in the budgetary process (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
Revenue Management Procedures (RMP) (Amaning et al., 2021)	Revenue collection efficiency	RMPe	The efficiency of revenue collection methods employed by the local	Evaluate the efficiency of revenue collection (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good;	Ratios

Variable and Source	Indicator	Notations	Definition	Measurement	Scale
			governmen t	76% - 100% = 4 Excellent)	
	Tax compliance rate	RMPc	The rate of compliance with tax regulations and policies	Rate the Compliance with tax regulations and policies (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
	Implementation efficiency	EPSe	The efficiency of implementing e-procurement systems within GIFMIS	The efficiency of implementing E-procurement (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
E-Procurement Systems (EPS) (Matto et al., 2023)	Procurement process transparency	EPSt	The level of transparency in the procurement process is facilitated by e-procurement systems.	The level of transparency on procurement processes (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
	Procurement cost-effectiveness	EPSc	The cost-effectiveness of procurement activities through e-procurement systems	The cost-effectiveness on procurement activities (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratios
Financial Transparency and Accountability (FTA) (Ingrams, 2018)	Financial reporting accuracy	FTAa	The accuracy of financial reports provided by the local governmen t	Evaluate the accuracy of financial (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good;	Ratio

Variable and Source	Indicator	Notations	Definition	Measurement	Scale
				76% - 100% = 4 Excellent)	
	Accountability in Fund Utilization	FTAu	The degree of accountability exhibited in fund utilization by local government	Evaluate the degree of accountability in fund utilization (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratio
	Adherence to audit recommendations	FTAr	The extent to which local government adheres to audit recommendations for financial improvements	Adherence to audit recommendations (0% - 25% = 1, Poor; 26% - 50% = 2, Moderate; 51% - 75% = 3, Good; 76% - 100% = 4 Excellent)	Ratio
Economic Factors (ECM) (Moderating) (Ahinsah-Wobil, 2021; Salah Mahdi et al., 2023)	Economic Growth Rate	EFMg	The impact of the rate of economic growth on local government performance	Evaluate the economic growth with a Likert Scale 1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly degree	Likert Scale
	Inflation Rates	EFMi	The impact of inflation rates on local government performance	Evaluate the inflation rate with a Likert Sale *1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly degree*	Likert Scale
	Fiscal Stability	EFMf	The impact of fiscal stability on local government performance	Evaluate the fiscal stability with a Likert Scale *1 = Strongly disagree; 2 = Disagree; 3 =*	Likert Scale

Variable and Source	Indicator	Notations	Definition	Measurement	Scale
				Agree; 4 = Strongly degree	
Digital Infrastructure (DIM) (Moderating) (Schade & Schuhmacher, 2022; Wu et al., 2023)	Availability of Digital Infrastructure	DIMa	The availability of digital infrastructure in local government	Evaluate the availability of DIM with a Likert Scale *1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly degree*	Likert Scale
	Quality of Digital Infrastructure	DIMq	The quality and reliability of digital infrastructure in local government	Evaluate the quality of DIM with a Likert Scale *1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly degree*	Likert Scale

The study assessed Ghana's local government on a variety of factors, including budget-related practices, revenue management procedures, e-procurement systems, financial transparency and accountability, economic factors, and digital infrastructure. The validity and dependability of the findings were contingent upon the researchers' choice of appropriate assessment methods and instruments. Evaluation of the effect of budget-related practices, revenue management, and e-procurement on financial transparency and accountability requires precise measurements of these variables.

In this study, budget practices were evaluated using ratio scale statements, with respondents to rate budget formulation, implementation, adherence to fiscal rules, and transparency. The measurement methodology conforms to research in public finance management (Nabieu et al., 2021). These ratio scale queries provided local governments in Ghana with a systematic and organized method for gauging the effectiveness and transparency of their budgeting procedures.

Revenue management processes were evaluated using ratio scale queries, with respondents providing feedback on the precision of tax collection, tax compliance, and revenue utilization. All studies on revenue management in various

contexts (Alm et al., 1992; Amaning et al., 2021) concur that this strategy is effective. Utilizing ratio scales to evaluate revenue management ensures conformity with standards and provides precise data for analysis.

Using ratios or percentage questions, the effectiveness of the e-procurement system was evaluated. Respondents were asked to rate the convenience with which the system can be implemented, the transparency of the procurement process, and the cost-effectiveness of the system. Prior studies support the validity of this method for measuring the effects of e-procurement (Matto et al., 2023). Using ratio scales ensures that users of the system provide constructive feedback in a standard format regarding the features and benefits of e-procurement systems.

As part of an assessment of financial transparency and accountability, ratio scales were used to evaluate factors such as the accuracy of financial reporting, accountability in fund usage, and compliance with audit recommendations. Ingrams (2018) used a similar methodology to examine the relationship between financial reporting, audit compliance, and accountability in different contexts. Respondents provided more organized feedback on the financial transparency and accountability of local governments using the ratio scale statements.

Inflation significantly impacts the purchasing power of government budgets, influencing fiscal planning and resource distribution. High inflation can lead to fiscal deficits and inefficiencies, compromising the operational effectiveness of financial management systems like IFMIS. These systems rely on stable economic conditions to ensure efficient operation and resource allocation. By controlling inflation, governments can create a conducive environment for budgetary reforms and effective public resource allocation (Ahinsah-Wobil, 2021). Fiscal stability, characterized by balanced budgets and sustainable debt levels, is fundamental to effective governmental financial management. A stable fiscal environment ensures consistent investments in the digital and human resources essential for the successful implementation and operation of IFMIS. By alleviating budgetary constraints, fiscal stability enables governments to focus on leveraging IFMIS to enhance accountability and governance outcomes (Tetteh et al., 2021). To measure these economic factors and their moderating effects, the study utilized Likert-scale queries, capturing respondents' evaluations of economic growth,

inflation, and fiscal stability based on their experiences and available data. This approach aligns with the methodologies used by Salah Mahdi et al. (2023) and Saksono et al. (2017). Employing Likert scales ensures standardization in assessing economic factors as moderators.

Dependable internet connectivity is crucial for the seamless functioning of digital financial systems like IFMIS. It enables real-time data exchange, efficient communication among stakeholders, and timely reporting of financial transactions. IFMIS's ability to achieve transparency and accountability significantly suffers without a robust and reliable internet infrastructure (Dzisah, 2022). IT expertise is equally critical for the effective deployment and utilization of IFMIS. Skilled personnel are essential for addressing technical challenges, managing system operations, and ensuring optimal usage. Furthermore, IT expertise supports the sustainability of digital systems, empowering local governments to maximize the benefits of IFMIS in enhancing financial management practices (Simpson et al., 2020). Respondents evaluated the quality and availability of digital infrastructure in local government using a binary scale to evaluate its role as a moderating variable. This approach aligns with methodologies employed in prior studies by Schade and Schuhmacher (2022) and Wu et al. (2023), which examine the impact of digital infrastructure on organizational processes and outcomes. Additionally, we used a Likert scale to capture respondents' perceptions of how digital infrastructure influences the relationships between budget-related practices, revenue management procedures, e-procurement systems, and financial transparency and accountability. Studies by Sedera et al. (2016), Roy and Al-Absy (2022), and F. Li et al. (2021) well-document the potential of digital infrastructure to amplify or diminish the impact of other variables on financial transparency and accountability. Utilizing binary scale statements enables a systematic evaluation of how digital infrastructure’s quality and availability shape these interactions, providing deeper insights into the dynamics of the study.

The use of ratios and Likert Scale statements for measuring variables contributed to the study's credibility and validity by ensuring that it follows standard research procedures and employs a systematic and organized approach to data collection.

3.5.3 Structural Equation Model

This study focused on investigating the interaction between financial transparency and accountability (FTA) and budget-related practices (BRP), revenue management procedures (RMP), and electronic procurement systems (EPS). PLS-SEM accounted for the potential moderating effects of external factors. The suitability of PLS-SEM for this particular research domain is underscored by its capability to handle non-normal data and integrate both formative and reflective components (Becker et al., 2012; Muthén, 2002).

The model is composed of two fundamental components: the structural model and the measurement model. By employing the measurement model, one can ascertain the relationship between the latent variables (BRP, RMP, EPS, and FTA) and the indicator variables that serve to quantify them. As stated by (Becker et al., 2012), distinct facets of each latent variable are captured by a variety of indicators. In the meantime, the structural model establishes the hypothesized associations between the latent variables. The study investigated the impact of digital infrastructure (DIM) and economic factors (EFM) on critical interaction between BRP, RMP, EPS, and FTA (Chin, 2010). To foster public confidence and good governance, this study employed PLS-SEM to analyze both models. The study provided insight into the interaction between BRP, RMP, and EPS to enhance financial accountability and transparency in the local government. Below are the mathematical models for the study;

Measurement Model

1 Budget-Related Practices (BRP): *BRP represents the latent construct of budget-related practices.*

The equation: $BRP = \lambda 1 * BRP1 + \varepsilon\_BRP$

2 Revenue Management Procedures (RMP): *RMP represents the latent construct of revenue management practices.*

The equation: $RMP = \lambda 2 * RM1 + \varepsilon\_RMP$

3 E-Procurement System (EPS): *EPS represents the latent construct of e-procurement implementation.*

The equation: $EPS = \lambda 3 * EP1 + \varepsilon\_EPS$

4 Financial Transparency (FT): *FT represents the latent construct of financial transparency and accountability. It's influenced by the three latent variables: BRP, RMP, and EPS.*

The equation: $FTA = \delta 1 * BRP + \delta 2 * RMP + \delta 3 * EPS + \varepsilon\_FTA$

λ1, λ2, λ3 are factor loadings, indicating how strongly each indicator measures its corresponding latent variable. $\delta 1, \delta 2, \delta 3$ are coefficients representing the influence of BRP, RMP, and EPS on FTA.

$\varepsilon\_BRP, \varepsilon\_RMP, \varepsilon\_EPS, \varepsilon\_FTA$ are error terms, capturing unobserved factors affecting the variables.

The Structural Model

1. Hypothesized Paths:

$BRP \rightarrow FTA$

$RRMP \rightarrow FTA$

$EPS \rightarrow FTA$

Shows the possible relationships between latent variables

2 Exploring Moderation:

Moderating Paths:

Economic Factors (EFM) and Digital Infrastructure (DIM) are modelled as possible moderators of the interactions between BRP, RMP, EPS, and FTA.

Equation: $BRP, RM, EP = \delta 1 * EF + \delta 2 * DI + \varepsilon\_MOD$

Moderation Coefficients (δ1, δ2): Measure the strength of these moderating effects.

Overall SEM model

Measurement Equations:

$BRP = \lambda 1 * BRP1 + \varepsilon\_BRP$

$RMP = \lambda 2 * RMP1 + \varepsilon\_RMP$

$EPS = \lambda 3 * EPS1 + \varepsilon\_EPS$

$FTA = \delta 1 * BRP + \delta 2 * RMP + \delta 3 * EPS + \varepsilon\_FTA$

The correlation strength between FTA and each latent variable is denoted by the coefficients δ1, δ2, and δ3. The error term ε_FTA signifies the portion of FTA variation that cannot be explained by the latent variables.

The equation indicates that budget-related practices, revenue management procedures, and e-procurement systems all contribute positively to FTA. By applying SEM techniques to the data, the precise nature and magnitude of these correlations can be determined.

3.6 Data Analysis

SmartPLS is a robust programme that allows us to employ sophisticated analytic techniques in our research. As we investigate the interdependence of BRP, RMP, EPS, ECM, DIM, and FTA, the software's features are crucial. It would enable us to conduct complex statistical analyses, such as multiple regression, factor analysis, and structural equation modelling, which are required for the study. These methods allowed us to disentangle the complex web of factors and assess their individual and combined effects on the dependent variable. SmartPLS helped us develop exhaustive models, which explained why this feature is widely used. In our study, the ability to model the interrelationships in depth is crucial, as multiple variables interact to impact financial transparency and accountability. By incorporating formative and reflective constructs, latent variables, and various indicators, SmartPLS enabled us to develop a comprehensive model that encapsulates the nuances of the real world.

The multidimensional nature of our research topic was reflected in our findings due to the comprehensive methodology. SmartPLS assisted us in refining our measurement model, thereby increasing the precision of our measurements. This is essential for ensuring that our survey tools capture the pertinent latent components effectively. SmartPLS was used to perform CCA to ensure that the survey items serve as valid indicators of the a priori constructs of interest thereby strengthening the foundation of our analysis and bolstering confidence in our data by enhancing the measuring methodology.

The moderation analyses place significant emphasis on the role that economic factors and digital infrastructure played as moderators of the associations found between the independent and dependent variables. There was an investigation into the influence of extraneous variables on the positive or negative effects of budget-related practices, revenue management procedures, and e-procurement on financial transparency and accountability by utilizing SmartPLS, which is outfitted

to conduct moderation studies. This capability permitted a deeper comprehension of the intricate processes at play.

In line with the requirements of quantitative research and the use of PLS-SEM as the main analysis technique, this study formulates explicit statistical hypotheses to guide hypothesis testing. PLS-SEM allows for the estimation of complex models with multiple dependent and independent variables, and it relies on statistical hypothesis testing to evaluate the significance of path relationships using bootstrapped standard errors, t-values, and p-values.

To test the conceptual relationships between the IFMIS components (budget-related practices, revenue management procedures, and e-procurement systems) and financial transparency and accountability, each research hypothesis is supported by a statistical hypothesis: the alternative hypothesis (H_1). These hypotheses are formulated to determine whether the relationships proposed in the conceptual framework are statistically significant.

The hypotheses guiding this study are as follows:

H1: Budget-related practices within IFMIS have a positive and significant effect on enhancing financial transparency and accountability in local government in Ghana.

H2: Revenue management procedures integrated within IFMIS positively and significantly impact financial transparency and accountability in local government in Ghana.

H 3: E-procurement systems integrated within IFMIS have a positive and significant influence on financial transparency and accountability within local government in Ghana.

H 4: Economic factors, including economic growth, inflation rates, and fiscal stability, moderate the relationships between budget-related practices, revenue management procedures, e-procurement systems within IFMIS, and financial transparency and accountability in local government in Ghana, and

H 5: The quality and availability of digital infrastructure in Ghana moderate the effect of budget-related practices, revenue management procedures, and e-procurement systems within IFMIS on financial transparency and accountability in local government in Ghana.

These hypotheses were tested using bootstrapping procedures in SmartPLS, which estimated path coefficients, t-values, and p-values. A significance level of 0.05 was applied to determine whether to reject the null hypothesis in each case. This formulation ensures that the statistical hypotheses are directly aligned with the analysis technique employed and addresses the methodological rigor required in structural equation modeling.

PLS-SEM has the extra benefit of being able to combine the Importance-Performance Map Analysis (IPMA). Unlike standard SEM, PLS-SEM allows researchers to evaluate not only the significance (total effects) of each construct on the dependent variable, but also their performance (mean score). In this study, IPMA was used to determine which constructs, such as budget-related procedures, revenue management, or digital infrastructure, are most influential in creating financial transparency and accountability. This delivers more actionable knowledge by emphasizing areas for improvement to increase the effect. As a result, incorporating IPMA strengthens the structural model findings and increases the analysis's policy relevance by leading targeted changes inside local government financial management systems.

The software's capacity to generate visual representations of our concept, such as route diagrams, was a significant advantage. These illustrations facilitated the explanation of the findings of the investigations. They were straightforward yet effective methods for explaining complex relationships to policymakers, constituents, and academics. SmartPLS is the central component of our data analysis strategy. Due to its superior analytical capabilities, support for holistic modelling, measurement model enhancement, moderation analysis, and capacity for visual representation, it served as the best instrument for separating the complex factors underlying financial transparency and accountability in Ghana's local government. SmartPLS has enabled us to conduct exhaustive analyses, which have

enhanced our understanding of the importance of our study to public finance management.

3.6.1 Data Limitation

The dependence on survey-based responses has intrinsic restrictions that may impact the quality and interpretability of the data. A primary worry is response bias, wherein respondents, especially those from local government entities, may offer excessively positive answers to conform to perceived expectations or evade examination. This bias diminishes the trustworthiness of self-reported assessments of financial transparency and accountability. Non-response bias remains a possible concern, even with efforts to achieve a high response rate through follow-up calls and in-person visits. Certain assemblies exhibited less responsiveness owing to restricted capability, disinterest, or skepticism regarding the study method, but eventually completed the task.

The heterogeneity in infrastructure and human resource capabilities across Ghana's 261 MMDAs contributes to the inconsistency in data accessibility and quality. Assemblies with inadequate digital infrastructure have had challenges in conducting electronic surveys or obtaining pertinent data for precise reporting. This could lead to issues with data completeness, potentially biasing results in favor of assemblies with more resilient infrastructures (Ahinsah-Wobil, 2021). A further restriction pertains to the subjectivity of survey instruments. Despite pilot testing and validation attempts to ensure clarity and reliability, variations in respondents' interpretations of survey questions may have influenced the consistency of results. The definitions of "adequate digital infrastructure" and "transparency in budget practices" may differ considerably among respondents depending on their jobs or institutional experiences. Moreover, the fluid characteristics of economic and digital landscapes pose difficulties for the design of cross-sectional surveys. Economic factors, including inflation rates and fiscal stability, as well as infrastructure enhancements or deteriorations, can vary throughout time.

This temporal unpredictability constrains the capacity to derive longitudinal

conclusions about the linkages between IFMIS adoption and financial transparency and accountability. Although attempts have been made to guarantee representativeness, the census technique employed to encompass all MMDAs may not entirely alleviate the issues presented by geographic and economic discrepancies. Urban assemblies often possess superior access to resources and digital technologies compared to their rural counterparts, thereby resulting in inequalities in the data gathered (Ghana Statistical Service, 2021). Mitigating these constraints requires the triangulation of survey replies with other data sources, including financial audit reports, independent reviews, and secondary data about digital infrastructure and economic indicators. In the future, researchers should use a variety of research methods, such as qualitative interviews and longitudinal designs, to really understand how and why people use IFMIS and what effects they have. These indicators can assist in addressing some issues related to survey-based approaches for evaluating PFM systems.

3.7 Research Procedures

The term "research procedures" refers to the structured and methodical processes by which researchers attempt to answer research queries and resolve research challenges (Alam, 2021). The research procedures for this study included a set of clearly defined actions and activities designed to investigate the relationships between local government BRP, RMP, EPS, FTA, ECM, and DIM in Ghana.

The first step in any investigation is to identify a problem or knowledge gap to address. Specifically, the research problem examined the effects of IFMIS on financial transparency and accountability within local government in Ghana, while examining the moderating effects of economic factors and digital infrastructure. The research questions and hypotheses were developed on the research problem. The research questions are as follows:

a) What is the effect of budget-related practices within local government on enhancing financial transparency and accountability in local government in Ghana?

B) How do revenue management procedures within IFMIS affect financial transparency and accountability in local government in Ghana?

c) What is the influence of e-procurement systems within IFMIS on financial transparency and accountability in local government in Ghana?

d) How do economic factors moderate the relationships between budget-related practices, revenue management procedures, e-procurement systems within IFMIS, and financial transparency and accountability in local government in Ghana?

e) What is the moderating effect of quality and availability of digital infrastructure on budget-related practices, revenue management procedures, e-procurement systems within IFMIS, and financial transparency and accountability in local government in Ghana?

Based on the research questions formulated, hypotheses were developed to guide the study. In our research, hypotheses are statements that can be tested to determine whether they accurately predict the relationships between variables. The hypotheses are

H1: Budget-related practices within IFMIS have a positive and significant effect on enhancing financial transparency and accountability in local government in Ghana.

H2: Revenue management procedures integrated within IFMIS positively and significantly impact financial transparency and accountability in local government in Ghana.

H 3: E-procurement systems integrated within IFMIS have a positive and significant influence on financial transparency and accountability within local government in Ghana.

H 4: Economic factors, including economic growth, inflation rates, and fiscal stability, moderate the relationships between budget-related practices, revenue management procedures, e-procurement systems within IFMIS, and financial transparency and accountability in local government in Ghana, and

H 5: The quality and availability of digital infrastructure in Ghana moderate the effect of budget-related practices, revenue management procedures, and e-procurement systems within IFMIS on financial transparency and accountability in local government in Ghana.

An exhaustive literature review is a vital component of every research project. It requires a comprehensive examination of the pertinent literature, theories, and empirical studies. This study examined scholarly works on the subject of public

sector financial management, with a focus on the local government in Ghana. The literature review gave insight into the current state of knowledge in the field, reveals where past successes and failings have occurred, and helps us pinpoint where our research may fill in the gaps. It facilitated the integration of our findings into larger theoretical and methodological frameworks. Critical to the viability of a study was the researcher's capacity to select an appropriate research design.

The study employed a quantitative approach and collected numerical data for analysis to solve this issue. The explanatory research strategy was optimal. It enables us to examine potential relationships between explanatory factors (BRP, RMP, and EPS) and the outcome (FTA). Integral to our research strategy was the meticulous planning of the procedure, including the estimation of the population of 261 MMDAs used for the study. The design of our structured questionnaires was guided by our research objectives and hypotheses. In addition, we provided an overview of the strategy for data analysis, which employed statistical methods such as regression analysis to formulate and test hypotheses and structural equation modelling (SEM).

3.8 Ethical Consideration

Ethical considerations are crucial in any research study, and this study is no exception. The following ethical considerations were taken into account in this study. The first step in any research endeavor should consist of obtaining the participant's informed consent. The participants were informed of the objectives of the study, how their responses would be used, and their ability to decline participation. The participants' anonymity and safety were maintained throughout the study. All personal information was kept confidential and anonymous, and participants' identities will not be revealed in any final reports or documents.

Participants were not compelled to participate in the study; rather, their participation was entirely voluntary. At any time and for any reason, participants were free to withdraw from the study. Minors, persons with disabilities, and other disadvantaged members of society received additional protection. In the investigation, no potentially detrimental or distressing information was included. Information about participants will be stored securely and encrypted to prevent

unauthorized access or disclosure. Only research team members had access to the data, which will be used solely for research purposes.

CHAPTER IV
RESEARCH RESULTS

This chapter delineates the outcomes of the statistical analyses conducted and provides an interpretation of these findings. The structure of this chapter is as follows. Initially, the chapter commences with an examination of the general information of the respondents. Subsequent sections delve into the construct of descriptive statistics and assess the normality of the data. Utilising the PLS-SEM approach, the chapter further articulates the confirmatory composite analysis, entailing a thorough assessment of the measurement model. This is complemented by an analysis of the structural model results, culminating in out-of-sample predictive power analysis and an importance-performance map analysis (IPMA).

4.1 Overview of Ghana's Metropolitan, Municipal, and District Assemblies (MMDAs)

Ghana operates a decentralized system of governance, with local authorities known as Metropolitan, Municipal, and District Assemblies (MMDAs) serving as the primary agents for local development and public service delivery. The decentralization framework, established under the 1992 Constitution and reinforced by the Local Governance Act, 2016 (Act 936), empowers MMDAs to plan, mobilize resources, and manage development initiatives at the local level. As of 2024, Ghana comprises 261 MMDAs, classified into three main categories: 6 Metropolitan Assemblies, 109 Municipal Assemblies, and 146 District Assemblies. These classifications are based on population size, urbanization, and infrastructure development.

Each MMDA operates as a corporate organization, with the District Assembly serving as the highest political and administrative authority. The Assemblies are in charge of budgeting, revenue generation, public procurement, development planning, and general financial administration within their respective