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Regulatory frameworks and double-bottom-line outcomes in Ghanaian cooperative financial institutions: The moderating role of firm characteristics

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Abstract---This study examines the influence of regulatory frameworks on the double-bottom-line (DBL) performance of cooperative financial institutions (CFIs) in Ghana, focusing on the moderating effects of firm age and size. Utilizing institutional and stakeholder theories, the study offers an empirical examination of the effect of regulatory compliance on financial and social outcomes. Data were gathered from 207 licensed CFIs across Ghana's 10 former administrative areas via a quantitative cross-sectional survey design. Partial Least Squares Structural Equation Modeling (PLS-SEM) was utilized to examine the direct and moderating influences among constructs. The findings indicate that regulatory compliance markedly improves DBL performance. Moreover, institutional age positively influences this relationship, indicating that older CFIs are more proficient in leveraging regulatory frameworks for improved results. Conversely, corporate size lacks a significant moderating effect. The findings underscore the importance of adaptive, tiered regulatory

monitoring, particularly in providing tailored solutions for younger CFIs. This research advances the current literature on cooperative finance by experimentally validating the DBL model within a regulatory context. It offers practical insights for legislators, regulators, and cooperative management, promoting varied regulatory strategies that align with institutional maturity.

Keywords---Double-bottom-line performance, Technology adoption, Cooperative financial institutions, Regulatory frameworks.

1. Introduction

Cooperative Financial Institutions (CFIs) are key players in the economic landscape of developing countries, especially in promoting financial inclusion for the underserved. In Ghana, CFIs like credit unions and financial cooperatives provide financial services to rural and semi-urban communities that are not included in the mainstream banking system. These institutions mobilize savings, lend to micro and small enterprises and strengthen local economic resilience through member driven financial solutions (Addo et al., 2021; Oppong & Dadzie, 2019). Their democratic ownership structure, focus on member welfare and grassroots orientation differentiate them from commercial banks making them critical players in national development agenda (WOCCU, 2020).

The regulatory environment in which CFIs operate has a huge impact on their performance, stability and ability to achieve both financial and social objectives. In Ghana, CFIs are regulated by two main bodies: the Credit Union Association (CUA) which supervises credit unions on behalf of the Bank of Ghana and the Department of Cooperatives (DOC) which oversees other cooperative financial institutions.

The function of these regulators is to ensure that CFIs meet national financial inclusion objectives, while also ensuring that they adhere to prudential principles and practices (BoG 2022; CUA 2021). Even so, variations in institutional mandates and the mechanisms for enforcing regulations within both CUA and DOC create distinct circumstances for CFIs, often leading to disparities in compliance outcomes and institutional effectiveness (Amoako-Adu et al, 2020).

In scholarly and practitioner discourses on CFIs, the double-bottom-line (DBL) approach has gained more popularity. The assessment of institutional performance should consider both financial metrics such as profitability, liquidity, and asset quality, along with social impact measures such as member outreach, community engagements, or financial literacy (Tchamyau & Boateng, 2019). Due to their mission of promoting financial sustainability and social empowerment, CFIs are particularly well-suited to the DBL perspective. Unlike commercial banks that prioritize shareholder value, CFIs must balance efficiency with equity, profitability with purpose (Ghosh & Van Tassel, 2022). This is in contrast to financial institutions.

Regulations are intended to stabilize financial systems and reduce risks, but they can also create operational challenges that impact smaller or younger institutions. The availability of administrative capacities, technological infrastructure, and human resources is a common factor in the compliance challenges faced by CFIs (Aluoch et al, 2021). Bwana & Mwakujonga (2013) found that CFIs often face challenges in operating due to the complexity of compliance procedures, reporting costs, and system integration challenges.

As a result, the internal characteristics of these institutions, such as their age, size, and governance structure, may have enduring consequences for their ability to meet regulatory requirements.

The literature has emphasized the significance of contextual variables, including age and size, for firms. It is believed that older institutions possess stronger internal structures, have a better understanding of compliance measures, and are more likely to trust stakeholders, which enhances their capacity to adhere to and take advantage of regulatory frameworks (Kyereboah-Coleman & Osei, 2008). Conversely, bigger CFIs may also have access to better compliance infrastructure, more qualified staff, and financial buffers to manage costs of ensuring compliance with regulations (Bassem, 2009). In contrast, smaller institutions may be more adaptable, community-integrated, and responsive to localized member needs, indicating that the relationship between firm characteristics and regulatory outcomes is more nuanced (Hartarska et al, 2013). In this context, one-size fits all regulatory approaches for the cooperative sector may not be enough to address institutional diversity within the organization.

A significant body of literature on CFIs has been generated, but only wenige empirical studies have examined the relationship between regulatory systems and DBL performance in Ghana, and less one has attempted to account for the moderating effects of firm-specific characteristics. Current investigations often prioritize regulatory compliance or performance outcomes over complex interactions that influence institutional behavior and effectiveness (Mensah & Nyarko, 2021; Atta-Mental, And Baah-Nuakoh, 1980). Moreover, studies in this domain are commonly descriptive and lack strong analytical models that account for multiple influences on CFI performance (Simpson & Power, 2015).

In order to address the empirical and theoretical gaps, this study seeks to explore the impact of regulatory framework on CFI DBL performance in Ghana, with an emphasis on the moderating role of firm age and size. It is based on survey data from 207 individuals and employs a quantitative approach. CFIs located in the ten former administrative regions of Ghana.' The analysis focuses on the direct influence of regulatory frameworks on DBL performance through PLS-SEM, while also exploring how firm-specific characteristics affect this connection. The use of this analytical method enables the estimation of latent constructs, such as regulatory strength and social performance, while accommodating sample size and distribution limitations (Hair et al, 2022).

Stakeholder and institutional theories are used to anchor the analysis, which provides a multi-level perspective on the interactions between external governance mechanisms (regulations) and internal organizational attributes (age and size).

Stakeholder theory posits that CFI'S hold accountability for performance across financial and social dimensions to a diverse group of members, including both board members and community actors, rather than solely to regulators or boards. (Freeman, 1984; Donaldson & Preston, 1995).

In contrast, institutional theory emphasizes the significance of formal structures, rules and norms in influencing organizational actions and outcomes (DiMaggio & Powell, 1983). The results can help shape policy discussion on the design of regulatory systems that are flexible to institutional variety and stage of development.

From a practical point of view, the work offers to CFI operators and regulators evidence based insights on how regulatory compliance can be used strategically to increase both financial sustainability as well as social impact. This approach offers a rich explanation as to the ways in which institutional context influences the degree to which governance contributes to inclusive financial sector outcomes.

2. Literature Review

2.1 Regulatory Frameworks and Financial Institutions

The rules and regulations really shape how well financial institutions, like Cooperative Financial Institutions (CFIs), run. They're put in place mainly to keep member savings safe, lower risks for the whole system, and make sure everything is clear and honest. Some of the main things these rules cover include requirements for how much money banks need to have, how loans are handled, managing risks, and what needs to be reported (CUA, 2021).

In Ghana, the system is a bit split. The Credit Union Association (CUA) in collaboration with the Department of Cooperatives supervises the credit unions with help from the Bank of Ghana, while the Department of Cooperatives (DOC) oversees other financial cooperatives. This dual system can lead to differences in how strictly things are managed and how accountable the institutions are, which can affect how CFIs do their jobs. Good regulations help improve how institutions are run, make things clearer for everyone, and reduce any shady behavior from management. For example, rules about lending limit what insiders can borrow, encourage regular audits, and make sure there's always enough cash available to prevent crises.

Regulations can also spark some creativity. Regular reviews and checks push CFIs to get better at managing their data, automate their reporting, and modernize member services, like going digital. Recently, Ghanaian CFIs have started using digital accounting and mobile banking mainly because of these regulatory changes, which has really helped them run more smoothly and made it easier for members to access their services.

The existing regulatory frameworks simultaneously function as restrictive barriers for less-resourced CFIs. Ofori and Boateng (2020) contend that poorly contextualized compliance requirements including uniform reporting thresholds

and capital reserve obligations place disproportionate burdens on smaller institutions. The absence of skilled personnel, technology infrastructure, and legal expertise in these CFIs results in their inability to achieve full compliance which leads to either partial adherence or informal bypass methods. The erratic enforcement patterns of regulatory agencies generate institutional unpredictability which complicates managerial strategic planning.

Comparative studies indicate that regulatory systems which implement a risk-based approach adjusted for institutional maturity and complexity attain superior compliance and performance results. Kenyan and Tanzanian SACCOs experiencing tiered regulatory oversight according to asset size and risk exposure showed enhanced financial performance and increased market shock resistance (Bwana & Mwakujonga, 2013). Ghana has the opportunity to study these frameworks in order to create unique regulatory approaches that advance both inclusion and sustainability.

2.2 Double-Bottom-Line (DBL) Performance in CFIs

The DBL framework goes beyond reliance on purely financial metrics by also incorporating social impact as an evaluative benchmark, thus bringing performance measurements in line with the cooperative culture of CFIs. DBL in credit is evaluated through CFIs performance which includes financial metrics, for example, net surplus, return on assets, portfolio at risk, liquidity ratios, as well as social indicators consisting of member outreach, women involvement, community development engagement, and client financial literacy advancement (Tchamyou et al., 2019; Ofori & Boateng, 2020).

Technology has brought about a change in many of the domains in our daily life driving a revolution in the way we communicate, work, play, etc. Smartphones and social media means that we can more easily keep up appearances even in spite of distance. In addition, remote working and virtual meetings are standard, then in terms of flexibility and collaboration, there is a whole new world of opportunities. Technology is not a step process, but a growth direction that keeps coming on furrowed field of society, overcoming ups-and-downs of each new cycle, uplifted to its new level.

Yet tension may arise between financial and social goals. Excessive financial self-interest such as, high interest rates, demands for collateral can hurt low-income members, and work against the aim of being inclusive. On the other hand, if risk control is sacrificed for outreach, you risk going broke. Regulations need to allow these CFIs to achieve the best possible balance. For instance, establishing separate lending rate caps for rural and urban branches or providing regulatory carve-outs for youth-oriented savings programs can enhance the DBL alignment. There is evidence that well-regulated CFIs have shown better performance in financial and social services. Atta-Mensah and Baah-Nuakoh (2022) found that CFIs which were collectively monitored, and provided training and upgrades in technology had enhanced DBL outcomes compared to their counterparts that were left to fend for their own. This indicates that regulation, if adaptive and supportive, strengthens the DBL mission.

2.3 Firm Characteristics as Moderators

Age and Size The institutional traits of CFIs, especially their age and size, are likely to affect how they respond to regulatory pressures. Older CFIs tend to have greater embedded knowledge and leadership, which makes it easier for them to interpret and anticipate regulatory changes (Kyereboah-Coleman & Osei, 2008). Such CFIs are more likely to have governance frameworks with documented compliance history, formalized policies and procedures, as well as established stakeholder networks that aid implementation of governance reforms.

In the same way, larger CFIs also enjoy economies of scale that strengthen their business resiliency. These CFIs generally possess diversified income streams, active capital market participation, and sophisticated internal control systems which better enable them to meet regulatory benchmarks and absorb compliance costs (Bassem, 2009). Also, their advanced information systems and professional training enable proactive risk management and responsive strategies to regulatory audits.

However, smaller CFIs possess some advantages that stem from institutional size. Community embeddedness and relational capital, as well as less bureaucratic structures are some benefits smaller CFIs tend to have. These attributes facilitate rapid decision-making, customized delivery of service, and higher member participation. Homogenization of guidelines in the absence of an institutional size factor can cause exclusion or failure of socially significant but smaller-sized CFIs, as per Tchamyou et al. (2019). Tiered compliance standards that adapt to institution variety are recommended by them.

The relationship between regulatory pressures and firm attributes has yet to be explored in Ghanaian research. Compliance has largely been treated in studies as an externally driven function, without considering how internal abilities act as mediators of outcomes. The current study addresses this by theorizing size and age to act as moderators of the interaction between DBL performance and regulatory institutions.

2.4 Empirical Gaps and Theoretical Framing

While the Sub-Saharan African CFIs literature extends more and more scholarship, relatively few studies take an integrative perspective that considers the interaction of regulation, firm internal characteristics, and multi-dimensional performance outcomes. A lot of earlier work takes into consideration research on either the impact of regulation on compliance or social and financial performance determinants without considering the way in which these variables interact. This fragmentation constrains our analysis of the processes by which regulation influences institutional action and mission accomplishment (Simpson & Power, 2015).

Theoretically, stakeholder theory advances the argument that CFIs owe responsibility to multiple constituencies; members, regulators, community players, and funders with diverse expectations of their performance (Freeman, 1984; Donaldson & Preston, 1995). This diversity compels CFIs to accommodate

conflicting interests while remaining transparent and legitimate. Institutional theory substantiates this argument by arguing that organizations react not only to coercive regulation but also to normative and mimetic pressures from their institutional environments (DiMaggio & Powell, 1983).

The convergence of these two theoretical models offers a more comprehensive understanding of regulatory impact. Institutional theory explains why and how they transform based on new rules and norms, while stakeholder theory explains why CFIs ought to pursue DBL outcomes. Together, they provide a multi-faceted model for evaluating the way internal and external influences collectively shape performance.

This research fills the empirical gap by providing a model linking regulatory stringency, institutions, and DBL performance through Partial Least Squares structural equation modeling (PLS-SEM). It allows for one to estimate relationships between latent variables and to obtain information regarding moderating effects. The results are anticipated to inform policymakers when designing differentiated regulatory systems to take into account institutional heterogeneity and encourage financial inclusion and accountability.

3. Methodology

3.1 Research Design

This study adopted a quantitative research design utilizing a cross-sectional survey approach to investigate the relationship between regulatory frameworks and double-bottom-line (DBL) performance in Ghanaian cooperative financial institutions (CFIs). The choice of a quantitative strategy was informed by its capacity for systematic, objective measurement and the ability to statistically test predefined hypotheses (Creswell & Creswell, 2018). The cross-sectional design was appropriate because it allowed the researcher to capture a snapshot of variables and their relationships at a single point in time, which is suitable for policy-related institutional studies.

A structured survey instrument was developed to gather standardized responses across a diverse set of CFIs. Quantitative methods also provide the advantage of generalizability when sampling is rigorous, thereby offering empirical evidence that can inform regulatory and institutional practice. Given the study's focus on latent constructs such as regulatory compliance and DBL performance, the use of structured scales within a quantitative framework was particularly suited to model the underlying theoretical constructs statistically.

3.2 Population and Sampling

The population for the study comprised all licensed cooperative financial institutions in Ghana, including credit unions under the supervision of the Credit Union Association (CUA) and other cooperative financial institutions regulated by the Department of Cooperatives (DOC). The inclusion criteria required that institutions be legally recognized, operational, and provide financial services directly to members. The stratification of the population across Ghana's ten former administrative regions ensured regional representativeness, given the

varying economic, infrastructural, and regulatory environments within the country.

To determine the minimum sample size, Yamane's (1967) formula was applied using a confidence level of 95% and a margin of error of 5%. The formula:

$$n = N / (1 + N(e^2))$$

where n = sample size, N = population size (estimated at 1,000 CFIs), and e = margin of error (0.05), yielded a required sample size of approximately 285. This method is widely accepted in social sciences for large populations and ensures adequate statistical power. In total, 231 responses were received, and after data cleaning and checking for completeness, 207 valid responses were used for analysis, representing a usable response rate of 72.6%.

3.3 Instrument Design and Validation

The survey instrument was grounded in theoretical constructs drawn from the literature on regulatory compliance, financial and social performance, and organizational theory. It consisted of five structured sections: (1) demographic and institutional profile; (2) regulatory compliance practices; (3) financial performance indicators (e.g., portfolio quality, return on assets); (4) social performance indicators (e.g., outreach, gender inclusion, member training); and (5) firm characteristics including size and age.

Each construct was operationalized using multiple-item Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree), allowing for nuanced measurement of perceptions and practices. The items were adapted from validated instruments in the cooperative finance literature, such as those used by Tchamyou et al. (2019), Mensah and Nyarko (2021), and Hair et al. (2016). To ensure face and content validity, the questionnaire was reviewed by subject matter experts including cooperative regulators, financial analysts, and academic researchers.

A pilot study involving 15 CFIs was conducted to pre-test the instrument. Feedback from this pilot informed adjustments to wording, sequence, and clarity. Reliability of the scales was preliminarily assessed using Cronbach's alpha, and all multi-item constructs exceeded the 0.7 threshold, indicating internal consistency. These pre-testing and validation steps were essential to enhance construct validity and reliability.

3.4 Data Collection Procedure

Data collection occurred between January and March 2025 and employed a mixed-mode approach combining online Google Forms distribution and physical administration through regional cooperative offices. This approach was necessary to maximize reach and accommodate institutions with limited digital infrastructure. Prior to participation, institutions received information sheets explaining the study's purpose, and consent was obtained from all respondents. Participation was entirely voluntary, and no incentives were offered.

Ethical clearance for the study was granted by the research ethics committee of Valley View University. The research protocol emphasized confidentiality, data anonymity, and the right to withdraw. Responses were coded and stored securely with access restricted to the principal investigator. These procedures ensured adherence to ethical standards and minimized risks to participants.

The response rate of 72.6% is considered high for organizational surveys, reflecting the relevance of the topic and the effectiveness of follow-up mechanisms used, such as telephone reminders and assistance from regional cooperative leaders.

3.5 Data Analysis Techniques

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. PLS-SEM was chosen for several reasons: it handles complex models involving multiple latent variables; it is suitable for exploratory research; and it performs well with small to medium sample sizes (Hair et al., 2022). The method supports simultaneous evaluation of measurement models (relationships between observed indicators and latent constructs) and structural models (hypothesized paths among constructs).

The structural model specified regulatory framework as an exogenous construct influencing DBL performance, with the latter conceptualized as a second-order latent variable comprising financial and social performance dimensions. Firm size and age were modeled as moderators of this relationship. Reflective measurement models were applied to all latent constructs, consistent with existing literature (Hair et al., 2022).

Construct reliability was assessed using Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). All constructs exceeded the recommended thresholds: Cronbach's alpha > 0.7, CR > 0.7, and AVE > 0.5. Discriminant validity was verified through the Fornell-Larcker criterion and cross-loadings, ensuring that constructs were empirically distinct. Path coefficients, t-statistics, and p-values were obtained using bootstrapping with 5,000 resamples.

3.6 Control Variables

To isolate the effects of the main constructs, several control variables were included: (1) institutional size measured by total assets and number of employees, (2) age measured in years of operation, (3) number of branches, and (4) regulatory classification (CUA-only vs. dual-regulated institutions). These controls were chosen based on literature suggesting their potential influence on performance outcomes (Kyereboah-Coleman & Osei, 2008; Ofori & Boateng, 2020). Including them improves model specification and helps mitigate omitted variable bias.

3.7 Assumptions and Limitations

The study made several assumptions. First, it assumed that respondents understood and interpreted the survey items consistently. While the pilot test minimized ambiguity, self-reporting bias and socially desirable responses cannot

be ruled out. Second, the cross-sectional design captures associations rather than causality, limiting the ability to infer directional effects.

Despite these limitations, the study offers methodological strengths: use of a validated and pre-tested instrument, a robust sampling design, and advanced modeling through PLS-SEM. These features enhance the internal validity, external validity, and practical applicability of the research findings.

4. Results

4.1 Descriptive Analysis

A total of 207 valid responses were analyzed from cooperative financial institutions (CFIs) across Ghana's ten former administrative regions. The demographic profile of respondents showed a relatively even distribution across governance and operational roles: 42% were managers, 30% board members, and 28% compliance, finance, or administrative officers. This diversity in roles provides a balanced representation of strategic and operational perspectives within CFIs.

Regarding institutional characteristics, 45% of surveyed CFIs were small-sized (fewer than 500 members), 35% medium-sized (500–1,000 members), and 20% large-sized (over 1,000 members). In terms of institutional age, 32% of CFIs had been operational for 11–20 years, 28% for over 20 years, and the remainder for less than a decade. These statistics indicate a mature respondent base, likely to have established regulatory interactions and measurable DBL practices.

Preliminary descriptive analysis of the constructs indicated strong positive responses to items measuring regulatory compliance, with an average rating of 5.7 on a 7-point Likert scale. Social performance items, such as outreach to marginalized communities and member education programs, showed moderate but consistent support (mean = 5.2). Financial performance items, including loan repayment and savings mobilization, were rated highest overall (mean = 6.1), reflecting the emphasis CFIs place on sustainability.

4.2 Measurement Model Assessment

To validate the measurement model, reliability and validity assessments were conducted using SmartPLS. Internal consistency was established through Cronbach's alpha and Composite Reliability (CR). As shown in Table 1, all values exceeded the recommended thresholds ($\alpha > 0.7$, $CR > 0.7$), indicating internal reliability. Convergent validity, assessed using Average Variance Extracted (AVE), surpassed the 0.5 threshold for all constructs.

Discriminant validity was confirmed using the Fornell-Larcker criterion, where each construct's AVE square root exceeded its correlation with other constructs. Additionally, Heterotrait-Monotrait ratios (HTMT) were below the 0.85 cutoff, supporting the distinctiveness of constructs.

Table 1. Measurement Model Summary

Construct	Cronbach's Alpha	Composite Reliability	AVE
Regulatory Compliance	0.81	0.88	0.62
Financial Performance	0.84	0.89	0.66
Social Performance	0.86	0.90	0.69
Double-Bottom-Line	0.83	0.87	0.65

4.3 Structural Model Analysis

Structural model testing using bootstrapping (5,000 resamples) demonstrated robust results. The primary hypothesis that regulatory frameworks significantly impact DBL performance was supported ($\beta = 0.41$, $p < 0.01$). This suggests that institutions with higher regulatory compliance also report stronger alignment between financial sustainability and social responsibility.

Firm age significantly moderated this relationship ($\beta = 0.29$, $p < 0.05$), indicating that older CFIs benefit more from regulatory engagement, possibly due to institutional memory, stronger governance structures, and accumulated capacity. Firm size, while positively related ($\beta = 0.12$), did not show statistical significance ($p = 0.11$), implying that institutional scale alone may not enhance DBL alignment unless paired with other capabilities.

The model's explanatory power was high, with an R^2 of 0.53 for DBL performance. This indicates that 53% of the variance in DBL outcomes is explained by regulatory compliance, firm age, and size. These findings underscore the relevance of tailored regulatory engagement strategies for CFIs.

Table 2. Structural Model Results (PLS-SEM)

Pathway	Coefficient (β)	p-value
Regulatory Framework $\rightarrow$ DBL Performance	0.41	< 0.01
Regulatory $\times$ Firm Age $\rightarrow$ DBL Performance	0.29	< 0.05
Regulatory $\times$ Firm Size $\rightarrow$ DBL Performance	0.12	0.11
R^2 (DBL Performance)	0.53	

4.4 Additional Analyses

Control Variables and Robustness The robustness of the model was enhanced by including several control variables: the number of branches, dual versus single regulatory status, and staff size. While none of these significantly altered the primary relationships, their inclusion slightly increased the model's predictive relevance ($Q^2 = 0.31$). Dual-regulated institutions (those supervised by both CUA and DOC) showed marginally higher DBL performance, suggesting that regulatory complementarity might be beneficial.

A multigroup analysis was also conducted to compare CFIs with different sizes and regional locations. While regional effects were statistically insignificant, CFIs in urban areas scored marginally higher on financial performance metrics, while rural CFIs excelled in social impact areas such as financial literacy and women's

access to loans. This aligns with findings by Ofori and Boateng (2020), who noted that social mission tends to dominate in less financially saturated regions.

5 Discussion of Findings

The results reinforce theoretical predictions from stakeholder and institutional theories. Regulatory frameworks appear to function both as external enforcement tools and as internal legitimization mechanisms. More established organizations seem to be better placed to navigate and reconcile regulatory processes due to matured bureaucratic processes and management experience with compliance processes.

The absence of a strong moderating effect of size indicates that large operations in and of themselves do not produce DBL performance unless complemented by governance structures attuned to members' needs. This contradicts some microfinance literature assumptions in which it is assumed that larger institutions will be more efficient (Bassem, 2009).

In the real world, that translates to regulators needing to account for differentiated oversight approaches. Instead of mandating one-size-fits-all compliance procedures, a tiered system that accounts for institutional maturity would enhance compliance as well as influence. For instance, mentoring and staged compliance programs could help smaller or younger CFIs be inducted into regulatory systems gradually.

The explanatory ability of 53% further supports the explanatory ability of the model for real-world performance of CFIs. This comes at a time when empirical research that is large-scale in nature and located within Sub-Saharan Africa using structural modeling methods such as PLS-SEM has been less common.

The results are definitive proof that regulatory systems have significant effects on the social and financial performance of CFIs in Ghana. Institutional age strengthens such effects, but firm size has no statistically significant effect. These results prove the excellence of coming up with regulatory policies that are responsive and adaptable to the unique characteristics of every CFI.

This study's findings offer key evidence of the interaction between institutional frameworks and double-bottom-line (DBL) performance among Ghanaian cooperative financial institutions (CFIs), with an implication of how institutional traits like age and size function to mediate such an interaction. The findings confirm prevailing financial regulation and cooperative governance theories, as well as offering new empirical evidence in the Sub-Saharan African context.

Second, the resultant positive and statistically significant relationship between DBL performance and adherence to the regulatory framework confirms the prior works in existing literature. Abor and Biekpe (2007) and Mensah and Nyarko (2021) attested in their studies that regulatory supervision fosters transparency, enhances the governance, and raises the quality of the loan book. This draws upon the above by showing that well-governed CFIs in Ghana are not just financially stronger but also better at achieving their social mandates, such as

enhancing access to finance among poor and vulnerable individuals and enhancing financial education.

Also, the research is consistent with Ofori and Boateng (2020) in the sense that it discovers how regulation-based alignment enables CFIs to make a balance between profit interests and social demands. The evidence is such that greater compliance is linked with institutions having improved DBL performance, thereby supporting the assumption that prudential rules, when well designed and implemented, are facilitatory rather than restrictive mechanisms.

One of the more interesting conclusions relates to institution age's moderating effect. The research validated that older CFIs had a stronger positive correlation between the extent of compliance with regulatory obligations and performance of DBL. The result is theoretically consistent with institutional theory, where it is argued that older organizations are well positioned to deal with external pressures because of acquired experience, internalized traditions, and reputation capital (Kyereboah-Coleman & Osei, 2008). More mature older CFIs in Ghana would have been exposed to regulatory regimes for longer and would thus have more sophisticated systems of compliance and an accountability culture.

According to stakeholder theory, age discrimination becomes translated into higher levels of responsiveness to members, higher trust relationships with regulators, and higher legitimacy in the eyes of society.

These findings mirror those of Bassem (2009), who emphasized that the maturity of cooperative institutions contributes to governance stability and better social performance outcomes. This suggests that as institutions age, their ability to interpret, internalize, and leverage regulatory standards increases, leading to a more coherent delivery of both financial and social objectives.

In contrast, the study found that institutional size did not significantly moderate the relationship between regulation and DBL performance. This challenges assumptions commonly found in the microfinance and cooperative finance literature, which often suggest that larger institutions, by virtue of greater resources and infrastructure, are better equipped to comply with regulatory requirements and achieve performance targets. While Hartarska et al. (2013) argued that economies of scale may improve operational efficiency, the present study suggests that size alone does not equate to effective DBL outcomes unless accompanied by institutional strategies that prioritize both financial sustainability and social value creation.

This discovery calls for reconsideration of scale's place in regulatory policy design. Major CFIs can possibly be exposed to greater bureaucratic inertia or encounter more complicated operating circumstances that weaken regulations' effect on DBL goals. Or major institutions can practice compliance procedures ritually but not necessarily thoroughly ingrained within their strategic programs; an institutional theory phenomenon referred to as decoupling (DiMaggio & Powell, 1983). These forces account for the failure to detect a statistically significant size effect and call for additional qualitative studies to explore organizational behavior in larger CFIs.

The second major contribution of this study is the use of Partial Least Squares Structural Equation Modeling (PLS-SEM) to measure latent constructs and also interaction variables. The technique enabled the study of both the financial and social aspects of performance simultaneously, a richer and multidimensional analysis compared to the traditional regression analysis. The relatively high R^2 measure value of 0.53 underscores the model explanatory capability and justifies the roles of regulatory and institutional determinants in determining DBL outcomes.

The stakeholder-institutional relationship offers a rich theoretical context for interpreting the findings. From a stakeholder framework, CFIs have to navigate a number of competing demands from regulators, employees, communities, and members.

Institutional theory fills this gap by illustrating how these demands become entrenched within formal and informal rules that govern organizational behavior. Positive regulation, effect on DBL performance, especially in older institutions, illustrates the function of formal external pressures to bring about internal congruence with stakeholder interests.

Practical implications follow for policymakers and regulators. First, the research requires regulators to design differentiated regulatory architectures sensitive to institutional maturity. "One-size-fits-all" regulation can be ineffective at responding to the varying needs and capacities of CFIs at various stages of development. A tiered model of phased regulation, proposed by Bwana and Mwakujonga (2013), could include phased requirements in terms of compliance, capacity-building assistance, and targeted supervision techniques. These measures would make regulatory inclusiveness possible without diminishing financial integrity.

For the boards and managers of CFIs, the study highlights the value of compliance culture and institution-building. Participation in long-term asset management structures, employee training initiatives, and internal controls can make the institution more capable of complying with regulation and achieve financial performance and social outcomes. Giving priority to strategic planning with vision for regulation can also make CFIs resilient and nimble market players in the financial sector.

Apart from this, the co-supervision of CUA and DOC also warrants further examination. Though not statistical significance in this research project, preliminary findings indicate that double-supervised institutions can leverage regulatory complementarity. It may result in more integrated compliance approaches and stronger DBL orientation. Future studies can explore the effect of the interaction among multiple regulatory stakeholders on institutional complementarity, redundancy of effort at compliance, or learning across regulatory regimes.

Last but not least, the current study contributes to the CFIs literature by presenting empirical evidence of the pivotal role of regulatory design in defining financial and social performance. Institutional age as a moderator supports the

capacity-sensitive regulatory design arguments, and the findings on institutional size contradict common assumptions and open new research avenues. By synthesizing stakeholder and institutional theory and a strong methodological framework, the study contributes to theory, policy, and practice within the cooperative financial sector.

This line of argument, thus, underscores the value of institution-specific and responsive regulatory approaches sensitive to institutional diversity. It further suggests a multi-faceted approach to the measurement of CFI performance - one that considers both external systems of governance and internal capability factors, such as organizational sophistication, culture, and stakeholder outreach. These observations are especially relevant today, when CFIs are being called upon to discharge twin duties of economic justice and financial inclusion.

6. Conclusion and Policy Implications

This research aimed to investigate the effects of regulatory mechanisms on double-bottom-line (DBL) performance of Ghana's cooperative financial institutions (CFIs) and, in the process, explore the way institutional factors; i.e., age and size, mediate such an effect. The results highlight the strategic value of regulatory compliance not only as a tool for imposing financial health but also as an enabler of social benefits like member empowerment and inclusion.

One of the major findings of this research is that regulatory regimes have a dominant and positive influence on DBL performance. CFIs with higher compliance with regulatory norms have higher levels of financial performance and more extensive social outreach. This confirms the assumption that regulations, rightly designed and put into action, are not administrative burdens but drivers of long-run institutional strength. The results provide fine evidence to the expanding literature of empirical research that validates judicious oversight enhances the governance, risk management, and service quality provided by cooperative financial institutions.

One of the contributions of this study is empirical confirmation of the DBL framework in Ghana's cooperative finance industry. With Partial Least Squares Structural Equation Modeling (PLS-SEM), the research captured financial and social aspects of institutional performance simultaneously. The method enabled nuanced modeling of intricate latent variable interactions and constructed a strong platform on which to test the moderating effects of firm characteristics.

Institutional age emerged as a robust moderator of the regulation-performance relationship, in the sense that older CFIs had greater potential for internalization and learning from regulation guidelines. This is consistent with institutional theory, affirming that more mature organizations are likely to establish routines and structure so as to facilitate compliance and accountability. It also concurs with stakeholder theory, as older institutions stand greater chances of fulfilling the expectations of various stakeholders such as members, regulators, and the public.

Conversely, institution size had no impact on the relationship between regulation and DBL performance that could be identified. This contradicts the intuitive expectation that larger CFIs can better perform regulatory requirements. The results suggest that non-numerical determinants like organizational culture, leadership, and mission fit might be more significant in becoming successful than size. This discovery creates new avenues for future study, specifically to investigate how the internal dynamics of CFIs facilitate regulatory performance. Conceptually, the research cross-talks institutional and stakeholder theories to provide an expansive synthesis of cooperative finance performance.

It contributes to knowledge by empirically demonstrating how formal governance mechanisms (i.e., regulations) interact with organizational attributes to influence outcomes that are both economic and social. This integrative perspective is especially relevant for policymakers and academics interested in sustainable development, social finance, and inclusive financial systems.

Policy lessons of the study are important as well. Regulators like the Credit Union Association (CUA) and Department of Cooperatives (DOC) should shift from one-size-fits-all policy application and embrace tiered regulatory approaches that recognize institutional heterogeneity. For example, smaller and newer CFIs may be assisted with staged compliance initiatives and technical support while older and larger institutions may be induced to innovate within existing regulatory confines. To enhance the regulators' capacity and resource base will also be needed in ensuring efficiency of oversight.

For managers and practitioners of CFI, the findings emphasize the need to mainstream compliance in strategic planning. Compliance is not an after-thought statutory obligation, but an organizational performance driver that creates institutional credibility, member trust, and long-term sustainability. CFIs need to make investments in governance systems, internal controls, and worker training to build the competencies needed for sound regulatory engagement.

The research is also policy-relevant for donor agencies and development partners operating in the financial inclusion sector. Promoting capacity-building activities among low-cap and younger CFIs would enhance their ability to drive inclusive financial growth quite significantly.

Also, information sharing platforms and peer to peer learning platforms for CFIs can enable industry-wide enhancement and diffusion of best practices. Future research could focus on cross-country comparison to study variation in regulatory impacts in different cultural, legal, and economic environments. Longitudinal analyses would also be useful to study the long-run impact of shifts in regulatory regimes on performance. Additional exploration of compliance behavior and organizational culture can deepen our knowledge of how regulation influences institution behavior.

In summary, the research affirms the overarching importance of regulatory frameworks in DBL performance construction among CFIs, particularly when institutional age is utilized as a moderator variable. The research calls for more adaptive, differentiated control measures and appeals to CFIs to adopt compliance

as a development approach. Through placing its findings within stakeholder and institutional theory, and employing a sound quantitative methodology, the research offers evidence-based advice to academics, practitioners, and policy-makers, ultimately informing the development of inclusive and accountable financial systems in Ghana and elsewhere.

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