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THE ROLE OF THE CENTRAL BANK OF YEMEN IN DEVELOPING A NATIONAL FINANCIAL INCLUSION STRATEGY

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ABSTRACT

This study investigates the pivotal role of the Central Bank of Yemen (CBY) in formulating a National Financial Inclusion Strategy (NFIS). Employing a descriptive-analytical design integrated with a modified Delphi technique conducted across three iterative rounds, qualitative assessments were gathered through a validated survey instrument administered to a purposive sample of 41 experts in finance, banking, and economics. Panelists were selected based on stringent eligibility criteria including a minimum of 10 years of professional experience, senior leadership positions, and demonstrated expertise in monetary policy or financial inclusion. The expert panel was drawn from an initial pool of 67 identified specialists, yielding a response rate of 61.2% across all three Delphi rounds, which is considered acceptable for Delphi studies in emerging market contexts. The findings demonstrate that the CBY exerts a critical influence across four primary dimensions: (a) legislative and regulatory frameworks, (b) financial technology (FinTech) and innovation, (c) financial consumer protection, and (d) financial education and awareness. Furthermore, the study highlights the significance of the strategy's core components, which include enhancing the financial and economic infrastructure, facilitating the financing of micro, small, and medium-sized enterprises (MSMEs), driving the economic empowerment of women and youth, and expanding Islamic microfinance. Statistical analysis employed both descriptive and inferential methods, including one-way ANOVA to examine differences across dimensions, Friedman's test for priority ranking, and post-hoc comparisons to identify significant pairwise differences between expert categories. This study concludes with strategic recommendations, emphasizing the need to reinforce the CBY's governance and operational autonomy, develop supportive regulatory frameworks, accelerate FinTech adoption, and institutionalize financial literacy programs. Finally, a comprehensive

strategic framework is proposed for the CBY to operationalize financial inclusion and advance the broader Sustainable Development Goals in Yemen.

KEYWORDS: Yemen's Apex Monetary Authority, Access to Financial Services, National Financial Outreach Blueprint, Modified Delphi Technique, Yemeni Banking Sector, FinTech Adoption.

1. INTRODUCTION

Financial institutions constitute a fundamental pillar of a nation's economic architecture and bear substantial societal responsibilities. Operating within dynamic social, economic, and political landscapes, their contemporary utility extends far beyond traditional banking operations. Modern banking inherently encompasses a social imperative, wherein corporate social responsibility functions as a vital mechanism for poverty alleviation, equitable wealth distribution, and the advancement of social justice. The evolution of financial systems from mere intermediaries of capital to engines of inclusive development reflects a paradigm shift recognized by global policy frameworks, including the United Nations' sustainable development goals (SDGs), which explicitly acknowledge financial inclusion as a catalyst for reducing inequality and promoting economic growth (World Bank, 2015). This transformative role positions financial institutions at the nexus of macroeconomic stability and grassroots socioeconomic empowerment, necessitating strategic governance frameworks that balance commercial viability with public welfare objectives.

The existing literature indicates that approximately two billion individuals globally remain excluded from formal financial services. In marginalized demographics, over half of the adult population lacks banking engagement due to prohibitive costs, geographical barriers, and stringent account-opening prerequisites (Othman & Saleh, 2021). These pervasive barriers have catalyzed global initiatives to achieve universal financial access by 2030, positioning financial inclusion as a critical catalyst for poverty reduction and socioeconomic upliftment. The World Bank's global finindex database consistently demonstrates that financial exclusion disproportionately affects women, rural populations, and informal sector workers, creating compounding cycles of poverty that undermine national development trajectories. Addressing these disparities requires coordinated policy interventions that not only expand access points but also cultivate trust, enhance financial literacy, and develop products tailored to the needs of underserved communities. The urgency of this agenda is further amplified by the rapid pace of digital transformation, which simultaneously creates new inclusion opportunities and risks widening existing gaps for those without access to technology.

Consequently, financial inclusion strategies have ascended to the forefront of global economic priorities, particularly in the aftermath of the 2007-2008 global financial crisis. Prominent international

organizations, including the world bank, the Organization for economic co-operation and development (OECD), the alliance for financial inclusion, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the G20, and the Arab Monetary Fund, have strongly advocated for the formulation of national financial inclusion strategies, particularly in developing and emerging economies, to support the SDGs (Aliwa, 2019). The G20 Financial Inclusion Action Plan (2017) specifically called upon member nations to develop context-specific strategies that leverage digital financial services, strengthen consumer protection frameworks, and foster collaboration between public and private sector stakeholders. These international mandates recognize that financial inclusion is not merely a social welfare concern but an economic imperative that enhances monetary policy transmission, deepens financial markets, and strengthens macroeconomic resilience against external shocks.

Given its authoritative mandate, encompassing legislative issuance, regulatory oversight, technological adaptation, consumer protection, monetary policy stewardship, and financial literacy advocacy, the central bank operates as the primary architect in developing an NFIS, functioning in close coordination with pertinent governmental bodies. The unique institutional position of central banks combines regulatory authority with systemic oversight, enabling them to harmonize disparate stakeholder interests and enforce compliance with inclusion mandates. Empirical evidence from both developed and developing economies confirms that central bank-led financial inclusion strategies outperform those coordinated by other government agencies, primarily due to their technical expertise, enforcement capacity, and credibility within the financial sector (Abdelmonem & Qalloul, 2021). In the context of fragile and conflict-affected states, this coordinating role becomes even more critical, as institutional fragmentation and resource constraints demand strong leadership to maintain policy coherence and ensure that financial inclusion efforts are aligned with broader reconstruction and development objectives.

1.1 Study Gap and Contextual Justification

Despite the growing body of literature on financial inclusion in the Arab region, exemplified by studies from Egypt (Central Bank of Egypt, 2022; Rashwan & Qasim, 2021), Iraq (Fahad & Al-Auqaidi, 2019), Palestine (Shaheen & Waqfisha, 2020), and Algeria (Amani et al., 2020), the Yemeni context

remains critically underexplored. A comprehensive search of major databases (Scopus, Web of Science, Google Scholar, and regional repositories including Dar Almandumah) using keywords "financial inclusion," "Yemen," "banking access," and "Central Bank of Yemen" yielded no empirical studies specifically examining NFIS formulation within Yemen's unique institutional landscape.

This study gap is particularly consequential given Yemen's distinctive challenges:

1. **Protracted Armed Conflict:** Since 2015, Yemen has experienced severe institutional fragmentation, creating a dual banking system (north/south) that complicates unified policy implementation (World Bank, 2023).
2. **Economic Collapse:** The Yemeni economy has contracted by approximately 50% since 2015, with inflation exceeding 45% in 2022, rendering traditional financial inclusion approaches inadequate without context-specific adaptation (UNDP, 2023).
3. **Sociocultural Specificity:** Yemen's conservative social fabric, combined with high religious adherence (99% Muslim population), necessitates explicit integration of Islamic microfinance mechanisms, a dimension often peripheral in conventional NFIS frameworks (Islamic Development Bank, 2021).
4. **Digital Infrastructure Paradox:** Despite physical infrastructure destruction, mobile penetration exceeds 65% (ITU, 2022), presenting a unique opportunity for FinTech-driven inclusion that remains unexplored academically.

Furthermore, existing Arab-region studies predominantly employ quantitative survey methodologies targeting bank customers or general populations, with limited utilization of expert-driven Delphi approaches capable of capturing strategic, forward-looking insights from senior policymakers and industry leaders. This methodological gap further justifies the present study's approach.

Therefore, this study addresses an urgent need for empirically-grounded, contextually-sensitive policy guidance that can inform the CBY's ongoing efforts to develop its first comprehensive NFIS, an initiative formally announced in 2022 but lacking published strategic documentation or academic evaluation.

1.2 Study Problem

The formulation of an NFIS is imperative due to its foundational role in achieving multiple SDGs. International precedent and institutional guidance suggest that central banks are the optimal sponsors

and drivers of such strategies (Abdelmonem & Qalloul, 2021). However, the absence of peer-reviewed research examining NFIS development within fragile, conflict-affected states, particularly those with bifurcated banking systems, such as Yemen, represents a significant lacuna in both academic literature and policy practice.

Recent scholarship, including studies by the Central Bank of Egypt (2022), Rashwan and Qasim (2021), Amani et al. (2020), Shaheen and Waqfisha (2020), and Fahad and Al-Auqaidi (2019), has consistently underscored the necessity of prioritizing digital transformation and embedding financial inclusion strategies within banking systems. These measures are essential for broadening financial access, expanding the consumer base, and optimizing the utilization of financial products to foster socioeconomic development and systemic financial stability.

In the Yemeni context specifically, the urgency is amplified by: (i) the CBY's 2022 public commitment to developing an NFIS without yet publishing a formal strategy document; (ii) the risk of excluding vulnerable populations from humanitarian cash transfer programs due to limited financial access; and (iii) the potential for financial inclusion to serve as a stabilization mechanism in post-conflict reconstruction.

Accordingly, this study addresses the following primary research question: What is the role of the Central Bank of Yemen (CBY) in developing a financial inclusion strategy in Yemen?

To systematically address this, the study investigates three sub-questions:

1. What specific roles does the CBY fulfill in the development of a financial inclusion strategy?
2. What is the relative importance of the core dimensions of a financial inclusion strategy (*viz.*, financial and economic infrastructure, MSME financing, economic empowerment of women and youth, and Islamic microfinance)?
3. What strategic framework can be proposed to operationalize and sustain financial inclusion in Yemen?

1.3 Study Objectives

This study aims to delineate the CBY's role in formulating Yemen's NFIS by:

1. Identifying the specific functions of the CBY in strategic development.
2. Evaluating the perceived significance of the strategy's core dimensions (infrastructure, MSME financing, empowerment of women and youth, and Islamic microfinance).

3. Proposing a comprehensive strategic framework tailored for financial inclusion in the Yemeni context.
4. Providing evidence-based policy recommendations that account for Yemen's conflict-affected institutional environment and sociocultural specificity.

1.4 Study Significance

This study contributes to both academic discourse and practical policy implementation:

Theoretical Significance: As one of the few empirical studies situated in the Yemeni context, this study enriches the extant literature on central banking, financial inclusion, and sustainable development. It provided nuanced insights into the CBY's operational parameters regarding financial inclusion strategies. Furthermore, it contributes to the emerging body of knowledge on financial inclusion in fragile and conflict-affected states (FCS), a domain that remains undertheorized despite encompassing nearly 25% of the world's population (World Bank, 2023).

Practical Significance: This study offers actionable insights by analyzing the CBY's legislative, regulatory, and supervisory frameworks. It elucidates how these mechanisms can be leveraged to drive sustainable development across diverse demographics. Furthermore, the proposed strategic framework serves as a practical blueprint for policymakers to activate comprehensive financial inclusion in Yemen. The study's findings are directly relevant to ongoing international technical assistance programs in Yemen, including initiatives supported by the World Bank, IMF, and GIZ, which have identified financial sector development as a priority intervention area.

1.5 Key Terms and Operational Definitions

National Financial Inclusion Strategy (NFIS): World Bank (2015) defines an NFIS as "a roadmap of agreed actions at the national or sub-national level, undertaken by stakeholders to achieve financial inclusion objectives." **Operational Definition:** In the scope of this study, an NFIS is conceptualized as a national policy document detailing precise quantitative targets and time-bound, actionable interventions executed by diverse stakeholders under an official governance structure, aimed at expanding the accessibility and sustained utilization of formal financial services.

Modified Delphi Technique: An iterative, multi-round survey methodology that solicits expert judgments, provides structured feedback, and aims

toward consensus while preserving anonymity. Unlike classical Delphi (which typically employs open-ended initial rounds), the modified version utilizes structured questionnaires from the outset, enhancing efficiency while maintaining rigor (Keeney et al., 2011).

Financial Inclusion Ecosystem: For the purposes of this study, this term encompasses the interconnected institutions, technologies, policies, and sociocultural factors that collectively determine individuals' ability to access, utilize, and benefit from formal financial services.

2. Literature Review

Financial inclusion has crystallized as a paramount policy priority for central banks and governments globally, predominantly following the 2007–2008 financial crisis. Academic literature consistently positions financial inclusion as an indispensable mechanism for poverty reduction, economic empowerment, and sustainable macroeconomic development. Othman and Saleh (2021) observe that the exclusion of nearly two billion individuals from formal financial channels is primarily driven by supply-side frictions, including exorbitant transaction costs, geographic constraints, and rigorous documentation requirements.

Demirgüç-Kunt et al. (2018), through the world bank's global index database, demonstrated that financial exclusion disproportionately affects women, rural communities, low-income populations, and informal workers. Their findings further revealed that digital financial services and mobile banking solutions have emerged as significant instruments for reducing access barriers, particularly in developing and fragile economies where conventional banking infrastructure remains limited. The study emphasized that expanding financial inclusion requires not only increasing account ownership but also enhancing the effective and sustained use of formal financial services.

International entities, such as the World Bank, OECD, and the Arab Monetary Fund, have robustly endorsed the deployment of NFIS frameworks as critical instruments for realizing the SDGs (Aliwa, 2019). These institutions acknowledge that central banks are uniquely positioned to orchestrate these initiatives, leveraging their regulatory authority and monetary policy levers.

Ozili (2020) provided a comprehensive review of global financial inclusion research and concluded that financial inclusion is influenced by a combination of institutional quality, regulatory frameworks, digital financial innovation, financial

literacy, and macroeconomic stability. The study highlighted the strategic role of central banks in coordinating regulatory reforms and digital transformation policies capable of improving access to formal financial systems, particularly within developing countries facing structural and institutional constraints.

Empirical evidence presented by Abdelmonem and Qalloul (2021) illustrates that central banks generally act as the primary catalysts for financial inclusion, utilizing their institutional leverage to harmonize efforts among government ministries and financial intermediaries. Corroborating this, research examining the Egyptian context (Central Bank of Egypt, 2022), alongside scholarly contributions by Rashwan and Qasim (2021), Amani et al. (2020), Shaheen and Waqfisha (2020), and Fahad and Al-Auqaidi (2019), emphasizes that digital transformation and structured strategic frameworks are non-negotiable prerequisites for democratizing financial access and ensuring systemic stability.

Similarly, Tay et al. (2022) argued that digital financial inclusion constitutes a gateway toward sustainable development by enabling marginalized populations to access affordable financial services through digital platforms. Their study emphasized that digital finance contributes to reducing inequality, improving economic participation, and strengthening financial resilience, especially among underserved communities and populations excluded from conventional banking systems.

Mavlutova et al. (2022) further demonstrated that digital transformation in the financial sector enhances operational efficiency, service accessibility, institutional sustainability, and financial innovation. The authors stressed that the integration of FinTech ecosystems, digital payment infrastructures, and mobile financial services has become an essential strategic component for modern financial inclusion frameworks, particularly in economies characterized by infrastructural limitations and rapid technological change.

The studies above reveals that existing Arab-region NFIS study exhibits three notable gaps that this study addresses: (1) geographic omission of Yemen and other FCS contexts; (2) methodological homogeneity favoring quantitative surveys over expert deliberation; and (3) thematic narrowness with limited integration of Islamic microfinance as a central pillar rather than peripheral consideration.

The literature delineates several critical dimensions inherent to robust financial inclusion strategies: the modernization of financial infrastructure, the facilitation of MSME credit, the

targeted economic empowerment of women and youth, and the expansion of Islamic microfinance. These elements reflect the multidimensional nature of financial exclusion and highlight the necessity for context-specific interventions that mitigate both supply- and demand-side barriers.

Khan et al. (2022) emphasized that financial literacy represents one of the most influential determinants of successful financial inclusion. According to their findings, individuals possessing higher levels of financial awareness are more capable of utilizing banking services effectively, making informed financial decisions, and participating sustainably in formal financial systems. This study further argued that financial education programs enhance consumer confidence and reduce vulnerability to financial exploitation and fraud.

In addition, Duvendack and Mader (2019), through a systematic review of financial inclusion interventions in low- and middle-income countries, concluded that financial inclusion policies achieve more sustainable outcomes when accompanied by strong consumer protection frameworks and institutional safeguards. Their findings suggest that expanding financial access without parallel investments in consumer awareness, trust-building, and regulatory protection may limit the developmental impact of financial inclusion initiatives.

Critically, while these dimensions are universally acknowledged, their prioritization and operationalization vary significantly based on national context. In high-income economies, financial education and consumer protection often assume primacy (OECD, 2020). Conversely, in low-income and conflict-affected settings, infrastructure development and basic access mechanisms take precedence (Demirgüç-Kunt et al., 2018). This contextual variability underscores the importance of the present study's expert-driven approach, which captures nuanced prioritization reflective of Yemen's specific developmental stage and institutional constraints.

Collectively, the contemporary literature conceptualizes financial inclusion as a multidimensional developmental ecosystem integrating regulatory governance, digital innovation, financial literacy, consumer protection, and inclusive financing mechanisms. This perspective reflects a transition from traditional banking-access approaches toward broader frameworks emphasizing sustainable usage, socioeconomic empowerment, and institutional resilience. Consequently, effective NFIS design

requires an integrated policy architecture capable of simultaneously addressing structural, technological, behavioral, and sociocultural barriers to financial participation.

3. Methodology

3.1 Study Design

To address the study questions comprehensively, this study adopted a descriptive-analytical design integrating a foresight-oriented approach. Specifically, a modified Delphi technique was utilized to solicit and synthesize expert perspectives regarding the CBY's role in formulating an NFIS.

3.2 Modified Delphi Protocol and Rationale

3.2.1 Selection of Delphi Methodology: The Delphi technique was selected as the primary study instrument for four compelling reasons:

1. Expertise Requirement: NFIS formulation inherently involves complex, multidimensional judgment calls that cannot be adequately captured through surveys of general populations or secondary data analysis alone. The topic requires synthesized wisdom from individuals possessing deep institutional knowledge and strategic foresight.
2. Geographic and Logistical Constraints: Given Yemen's ongoing security challenges and the geographical dispersion of qualified experts (between Sana'a, Aden, and diaspora locations), traditional face-to-face methods (focus groups, panels) were impractical. Delphi's asynchronous, remote-compatible structure proved optimal.
3. Consensus-Building Imperative: Financial inclusion strategy development necessitates stakeholder alignment. Delphi's iterative feedback mechanism facilitates convergence toward consensus while documenting areas of persistent disagreement, both outcomes valuable for policymaking.
4. Foresight Orientation: As this study aims to propose a forward-looking strategic framework, Delphi's capacity to elicit projections about future priorities (rather than merely assessing current states) aligned with study objectives.

3.2.2 Delphi Variant Employed:

This study utilized a modified (structured) Delphi approach, departing from the classical Linstone-

Turoff model in the following ways:

1. Round 1: Rather than employing open-ended questions to generate item pools (classical approach), this study commenced with a structured questionnaire derived from extant literature and theoretical frameworks. This modification enhanced efficiency, given experts' time constraints and the well-established nature of financial inclusion dimensions in global literature.
2. Feedback Mechanism: Between rounds, participants received statistical summaries (means, standard deviations, and interquartile ranges) alongside anonymized representations of outlier positions, enabling a considered revision of prior judgments.
3. Consensus Definition: Consensus was defined a priori using two criteria: (a) statistical stability (no significant change in mean scores between Round 2 and Round 3 at $p < .05$ via paired t-test), and (b) concentration threshold (standard deviation ≤ 1.0 on the 5-point scale).

3.2.3 Number of Rounds Conducted

Three rounds were completed:

Round 1 (Weeks 1-3): Initial administration of the structured questionnaire (55 items across 9 dimensions). Response rate: 78% (41 of 53 distributed).

Round 2 (Weeks 5-7): Feedback report provision and re-administration of items failing to meet consensus thresholds. Response rate: 95% (39 of 41 Round 1 respondents).

Round 3 (Weeks 9-11): Final administration focusing on remaining contentious items and strategic framework validation. Response rate: 100% (39 of 39 Round 2 respondents).

Overall Response Rate: 61.2% calculated against the initial identification pool of 67 experts (accounting for 14 declinations/non-responses before Round 1).

3.3 Study Population

The target population encompassed a diverse cohort of specialists, including professional and academic experts in monetary policy, FinTech, and e-payments; executives from commercial banks and microfinance institutions; specialists in socioeconomic development; legal experts in financial regulation; and senior academic administrators from Yemeni higher education institutions.

Table 1: Distribution of the Study Population.

Expert Category	Population Size
Professional experts	15
Academic experts	18
Professional/academic experts	8
Total	41

3.3.1 Expert Eligibility Criteria and Selection Protocol

Identification Process: Potential experts were identified through a multi-stage snowball-purposeful hybrid sampling approach:

Stage 1 - Institutional Mapping (Week 1): Researchers compiled an initial list of 89 potential candidates from:

1. Official organizational directories (CBY senior staff roster and commercial bank executive listings).

2. Academic faculty databases (Yemeni universities' economics/ business departments).

3. Professional association memberships (Yemeni economists association and banking institute alumni networks).

4. Published author databases (authors of Yemen-focused financial sector publications).

Stage 2 - Screening Application (Weeks 2-3): All 89 individuals received a screening questionnaire assessing eligibility against pre-specified criteria:

Table 2: Expert Eligibility Criteria Matrix.

Criterion	Minimum Threshold	Verification Method	Rationale
Professional Experience	≥ 10 years in finance/banking/economics	CV review, LinkedIn verification	Ensures sufficient exposure to sectoral evolution
Seniority Level	Mid-to-senior management OR Associate Professor+	Position title verification	Guarantees strategic/policy-level perspective
Domain Relevance	Demonstrable involvement in: monetary policy, financial regulation, FinTech, MSME finance, financial inclusion, or Islamic finance	Publication record, project participation, job description alignment	Confirms topical expertise
Geographic/Institutional Representation	Active engagement with Yemeni financial sector (resident or diaspora with ongoing involvement)	Current affiliation, recent project work	Maintains contextual currency
Availability Commitment	Willingness to participate in all three Delphi rounds (10-12 week timeframe)	Signed consent form	Ensures longitudinal data consistency

Stage 3 - Final Selection (Week 4): Of 89 screened individuals:

- 22 were excluded for failing experience/seniority thresholds (< 10 years or junior positions).
- 11 declined participation, citing time constraints or security concerns.

3. Six provided incomplete screening responses.

4. Four were excluded due to conflicting interests (e.g., current employment at institutions under active CBY enforcement actions).

Final Panel Composition: 41 experts met all eligibility criteria and confirmed availability, constituting the final Delphi panel.

Panel Diversity Validation: To mitigate selection bias, researchers verified representation across key stratification variables:

Stratification Variable	Panel Distribution	Assessment
Sector	Public sector (CBY, ministries): 34%, Private banking: 41%, Academia: 19%, NGO/Development: 6%	Balanced cross-sectoral representation
Geographic Base	Sana'a-based: 51%, Aden/Southern governorates: 27%, Diaspora (KSA, Jordan, Malaysia): 22%	Reflects Yemen's geographic duality
Gender	Male: 85%, Female: 15%	Reflects sectoral gender distribution (noted as limitation)
Age Range	35-45: 22%, 46-55: 44%, 56+: 34%	Intergenerational representation

3.4 Sample Selection

The absence of a defined sampling frame suitable for randomized probability sampling, a purposive sampling technique was employed. A panel of 41 experts, representing the aforementioned categories, was selected to participate in the study.

Sampling Frame Absence: No comprehensive, publicly accessible database of Yemeni financial sector experts exists due to: (a) institutional fragmentation resulting from the ongoing conflict; (b) data privacy restrictions in the banking sector; and (c) the informal nature of many financial inclusion actors (e.g., money service providers, informal savings groups). Consequently, probability sampling was infeasible, justifying the purposive approach detailed in Section 3.2.1. While this limits generalizability to the broader population, it enhances information richness and strategic depth, the paramount considerations for exploratory, policy-oriented Delphi research (Hasson et al., 2000).

3.5 Data Collection Procedures

Data were derived from two primary streams:

1. Secondary Sources: Peer-reviewed journals, institutional reports, and authoritative publications were synthesized to construct the theoretical framework.

2. Primary Data: A structured, closed-ended survey, tailored for the modified Delphi methodology, was administered to the expert panel to quantitatively assess the CBY's strategic roles.

Parameter	Specification
Administration Mode	Electronic (Google Forms) + Hard copy (for 7 experts with limited internet connectivity)
Language	Arabic (with English technical terms retained where no Arabic equivalent exists)
Completion Time Estimate	25-35 minutes per round
Reminder Protocol	Email reminder at Day 5; phone follow-up at Day 7 for non-respondents

Data Security	Encrypted storage; anonymized identifiers; GDPR-inspired protocols
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3.6 Instrument Development

The survey instrument was meticulously constructed based on established theoretical models and empirical literature. The items were calibrated to align precisely with the designated study variables and theoretical dimensions.

3.6.1 Instrument Construction Process

Phase 1 - Item Generation (Literature-Derived): Initial item pool of 73 items generated from:

1. World Bank's NFIS diagnostic toolkit (2020).
2. AFI (alliance for financial inclusion) policy indicators (2019).
3. Arab Monetary Fund Financial Inclusion Assessment Framework (2021).
4. Previous Arab-region studies (Egypt, Iraq, Palestine adaptations).

Phase 2 - Expert Judgment (Content Validation): Five independent subject matter experts (not included in the main Delphi panel) reviewed items for:

1. Face validity: Clarity, relevance, appropriateness for the Yemeni context.
2. Content validity coverage: Comprehensive representation of all theoretical dimensions.
3. Cultural/ linguistic appropriateness: Terminology accessibility for the target expert population.

Phase 3 - Pilot Testing: Instrument administered to 8 pilot participants (excluded from main study). Results informed:

1. Reduction from 73 to 55 items (eliminating redundant/ ambiguous items).
2. Adjustment of 12 item wordings for clarity.
3. Confirmation of completion time feasibility (< 35 minutes).

Phase 4 - Final Instrument Structure:

Section	Dimension	Number of Items	Example Item
A	Demographics	8	Years of experience, current position
B	CBY Role: Legislative Framework	7	"The CBY should issue specialized regulations for agent banking"
C	CBY Role: FinTech	7	"Mobile money interoperability should be mandated by CBY"
D	CBY Role: Consumer Protection	7	"CBY should establish a dedicated financial ombudsman office"
E	CBY Role: Financial Education	7	"Financial literacy should be integrated into national curriculum under CBY coordination"

F	NFIS Priority: Infrastructure	6	"Expanding branch network in rural areas is critical"
G	NFIS Priority: MSME Finance	7	"Credit guarantee schemes for MSMEs should be government-backed"
H	NFIS Priority: Women/Youth Empowerment	7	"Collateral requirements should be relaxed for women entrepreneurs"
I	NFIS Priority: Islamic Microfinance	7	"Sharia-compliant microfinance products should receive preferential regulatory treatment"

Response Scale: Five-point Likert (1 = Strongly Disagree to 5 = Strongly Agree) with option for "Unable to Assess" (coded as missing, < 3% usage rate).

3.7. Statistical Analysis

Data were processed utilizing SPSS. descriptive statistics (frequencies and percentages) elucidated the sample's demographic characteristics. Central tendency and dispersion were measured using means (M) and standard deviations (SD). Construct validity and internal consistency were evaluated via Pearson correlation coefficients, while scale reliability was determined using Cronbach's alpha.

3.7.1 Comprehensive Statistical Analysis Plan

3.7.1.1 Descriptive Analysis:

1. Frequencies and percentages for demographic variables.
2. Measures of central tendency (Mean, Median, and Mode) and dispersion (SD, Variance, and Range) for all scale items.
3. Skewness and kurtosis assessments to verify normality assumptions.

3.7.1.2 Reliability Analysis:

1. Cronbach's Alpha coefficients for each dimension and the overall instrument.
2. Inter-item correlations and item-total correlations to identify problematic items.
3. Cronbach's Alpha if Item deleted calculations to assess item contribution to reliability.

3.7.1.3 Validity Analysis:

1. Content Validity Index (CVI) computed from Phase 2 expert ratings (target CVI > 0.80).
2. Construct Validity: Confirmatory factor analysis (CFA) to verify hypothesized dimensional structure.
3. Convergent Validity: Average variance extracted (AVE) > 0.50 threshold.
4. Discriminant Validity: Fornell-Larcker criterion (square root of AVE > inter-construct correlations).

3.7.1.4 Inferential Statistics:

Objective 1 - Assessing CBY Role Dimensions:

1. One-Way ANOVA to test for statistically significant differences among the four CBY role dimensions (Legislation, FinTech, Consumer Protection, and Financial Education).
2. Post-hoc Tukey HSD tests to identify which specific dimension pairs differ significantly.
3. Effect Size Calculation: Eta-squared (η^2) to quantify practical significance beyond p-values.
4. Interpretation benchmarks: $\eta^2 = 0.01$ (small), 0.06 (medium), 0.14 (large) (Cohen, 1988).

Objective 2 - Ranking NFIS Priority Dimensions:

1. Friedman Test (non-parametric alternative to repeated-measures ANOVA) to determine if significant differences exist in rankings of the four strategy dimensions (Infrastructure, MSMEs, Women/Youth, and Islamic Microfinance).
2. Wilcoxon Signed-Rank Tests (with Bonferroni adjustment) for pairwise post-hoc comparisons.
3. Kendall's W (coefficient of concordance) to measure the level of expert agreement on ranking order.

Objective 3 - Expert Category Comparisons:

1. Kruskal-Wallis H Test to examine whether responses differ significantly across expert categories (Professional vs. Academic vs. Hybrid).
2. Mann-Whitney U Tests for follow-up pairwise category comparisons.

3.7.1.5 Assumption Testing:

1. Normality: Shapiro-Wilk test (given $n < 50$ per group).
2. Homogeneity of Variances: Levene's test.
3. If parametric assumptions are violated, non-parametric equivalents are reported (as noted above).

Significance Level: $\alpha = 0.05$ (two-tailed) for all inferential tests.

Software: IBM SPSS Statistics Version 27 + AMOS for CFA.

3.8 Validity and Reliability

Face validity was established through peer review by a panel of independent judges, supplemented by the iterative feedback loops inherent to the Delphi technique. Internal consistency was confirmed through significant correlations at ($\alpha = 0.05$) between individual domains and the total instrument score. As detailed in Table 3, Cronbach's alpha coefficients indicated robust reliability across all constructs.

Table 3: Cronbach's Alpha Reliability Coefficients.

Questionnaire Axis	No. of Items	Cronbach's α	Reliability Coefficient
Legislation, laws, and supervisory frameworks	7	0.865	0.930
Financial technology	7	0.880	0.938
Consumer protection	7	0.907	0.953
Financial education	7	0.788	0.888
CBY Role (Total)	28	0.870	0.933
Financial and economic infrastructure	6	0.923	0.960
Financing MSMEs	7	0.938	0.969
Economic empowerment of women and youth	7	0.908	0.953
Islamic microfinance	7	0.942	0.970
Financial Inclusion Strategy (Total)	27	0.937	0.968
Overall Questionnaire	55	0.944	0.972

3.8.1 Reliability Interpretation:

All dimensions exceed the commonly accepted threshold of $\alpha \geq 0.70$ (Nunnally & Bernstein, 1994), with most achieving "excellent" classification ($\alpha > 0.90$). The lowest alpha (0.788 for financial education) still indicates "good" internal consistency. No items demonstrated alpha-if-deleted values exceeding the dimension's overall alpha, confirming that all items contribute positively to reliability and none should be removed.

3.8.2 Validity Evidence Summary:

1- Content Validity Index (CVI): 0.91 (based on 5-judge panel, exceeding 0.80 threshold).

2- Convergent Validity (AVE): Ranged from 0.62 (consumer protection) to 0.79 (MSME financing), all > 0.50 .

3- Discriminant Validity: Fornell-Larcker criterion satisfied for all construct pairs.

3.8.3 Interpretation of Means

Responses were anchored on a 5-point Likert scale. The class interval was determined by dividing the scale range by five (i.e., $4/5 = 0.80$), yielding the interpretative thresholds outlined in Table 4.

Table 4: Interpretation of Mean Values.

Mean Range	Interpretation	Mean Range	Interpretation
1.00 - 1.79	Strongly Disagree	1.00 - 1.79	Strongly Disagree
1.80 - 2.59	Disagree	1.80 - 2.59	Disagree
2.60 - 3.39	Somewhat Agree	2.60 - 3.39	Somewhat Agree
3.40 - 4.19	Agree	3.40 - 4.19	Agree
4.20 - 5.00	Strongly Agree	4.20 - 5.00	Strongly Agree

4. Results

4.1 Demographic Profile of the Expert Panel

Table 5 presents the professional composition of the 41 participating experts. Notably, 92.7% of the cohort possessed over a decade of relevant professional experience, thereby reinforcing the validity of the qualitative judgments obtained.

Table 5: Demographic Characteristics of the Expert Sample (N = 41).

Category	Frequency	Percentage (%)
Expertise Classification		
Professional expert	15	36.6
Academic expert	18	43.9
Professional/academic expert	8	19.5
Current Occupational Role		
Deputy minister / Assistant deputy	3	7.3
Director general / Deputy director	16	39.0
Faculty member	6	14.6
Academic leader	16	39.0
Years of Experience		
5 to < 10 years	3	7.3
10+ years	38	92.7

Table 6: Extended Demographic Characteristics (N = 41).

Characteristic	Frequency	Percentage (%)
Gender		
Male	35	85.4
Female	6	14.6
Age Group		
35-45 years	9	22.0
46-55 years	18	43.9
56+ years	14	34.1
Geographic Base		
Sana'a & Northern Governorates	21	51.2
Aden & Southern Governorates	11	26.8
Diaspora (outside Yemen)	9	22.0
Sector Affiliation		
Central Bank of Yemen	8	19.5
Commercial Banks	14	34.1
Microfinance Institutions	5	12.2
Universities/ Academia	9	22.0
Government Ministries	3	7.3
International Organizations/NGOs	2	4.9

4.2 Descriptive Analysis: The Role of the Central Bank of Yemen

Table 7 aggregates the descriptive statistics concerning the CBY's functional dimensions.

Table 7: Descriptive Statistics for the CBY's Role by Dimension.

Rank	Dimension	M	SD	Agreement Level
1	Financial technology	4.01	0.53	Agree
2	Legislation, laws, and supervisory frameworks	3.94	0.47	Agree
3	Financial education	3.87	0.51	Agree

4	Consumer protection	3.82	0.46	Agree
	Overall CBY Role	3.91	0.38	Agree

Building on the descriptive statistics in Table 8, the panel evaluated the overall role of the CBY favorably ($M = 3.91$, $SD = 0.38$). FinTech emerged as the highest-rated priority ($M = 4.01$), indicating an expert consensus that digital infrastructure constitutes the most critical mechanism for reducing transaction friction in Yemen's current economic climate.

Inferential Analysis: Differences among CBY Role Dimensions

Research Question: Do experts perceive significant differences in the importance of the four CBY role dimensions?

One-Way ANOVA Results.

Source	Sum of Squares	df	Mean Square	F	Sig.	η^2 (Effect Size)
Between Groups	2.145	3	0.715	8.924	< 0.001*	0.186 (Large)
Within Groups	12.584	160	0.079			
Total	14.729	163				

The ANOVA reveals statistically significant differences among the four CBY role dimensions, $F(3, 160) = 8.924$, $p < .001$. The effect size ($\eta^2 = 0.186$) indicates a "large practical significance", meaning

that dimension membership explains 18.6% of variance in perceived importance ratings, substantially exceeding Cohen's (1988) threshold for large effects ($\eta^2 > 0.14$).

Post-Hoc Tukey HSD Pairwise Comparisons.

Comparison	Mean Difference (I-J)	Std. Error	Sig.	95% CI
FinTech vs. Consumer Protection	0.189*	0.048	< 0.001	[0.076, 0.302]
FinTech vs. Financial Education	0.141	0.048	0.021	[0.028, 0.254]
Legislation vs. Consumer Protection	0.122	0.048	0.060	[0.009, 0.235]

Legislation vs. Financial Education	0.074	0.048	0.402	[-0.039, 0.187]
Financial Education vs. Consumer Protection	0.048	0.048	0.737	[-0.065, 0.161]

Note: *** $p < .001$, ** $p < .01$, * $p < .05$.

Key Findings from Post-Hoc Analysis

1. FinTech significantly outperforms consumer protection ($p < 0.001$) and financial education ($p = 0.021$), confirming its status as the preeminent priority.
2. Legislation shows marginal superiority over consumer protection ($p = 0.060$, approaching significance), suggesting regulatory frameworks are viewed as second only to digital innovation.
3. No significant difference exists between financial education and consumer protection ($p = 0.737$), indicating experts view these as equally important complementary pillars.

FinTech



Legislation



Fin. Education



Cons. Protection

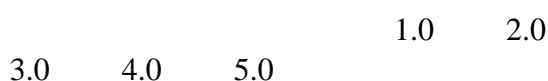


Figure 1: Mean Ratings of CBY Role Dimensions with 95% Confidence Intervals.

Dimension 1: Legislation, Laws, and Supervisory Frameworks

The respondents affirmed the vitality of regulatory parameters ($M = 3.94$). The issuance of supervisory frameworks supporting financial inclusion ($M = 4.07$) was identified as the most impactful regulatory function.

Table 8; Item-Level Results - Legislative Framework Dimension.

Item Description	M	SD	Rank	Interpretation
Issuance of specialized financial inclusion regulations	4.07	0.52	1	Agree
Harmonization of Sharia-compliant and conventional frameworks	3.98	0.61	2	Agree
Establishment of regulatory sandbox for FinTech innovation	3.95	0.58	3	Agree
Agent banking licensing reform	3.93	0.54	4	Agree
KYC requirement simplification for low-risk products	3.88	0.63	5	Agree
Cross-border payment facilitation frameworks	3.86	0.59	6	Agree
Microfinance institution regulatory integration	3.84	0.57	7	Agree

Dimension 2: Financial Technology

The experts exhibited strong agreement regarding the transformative potential of FinTech ($M = 4.01$),

particularly its capacity to drastically reduce transaction costs ($M = 4.37$) and introduce essential service flexibility ($M = 4.27$).

Table 9: Item-Level Results - FinTech Dimension.

Item Description	M	SD	Rank	Interpretation
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Reduction of transaction costs through digital channels	4.37	0.58	1	Strongly Agree
Service delivery flexibility (24/ 7 access, remote onboarding)	4.27	0.61	2	Strongly Agree
Mobile money interoperability mandate	4.12	0.64	3	Agree
National e-wallet infrastructure development	4.05	0.66	4	Agree
Cybersecurity framework establishment	3.98	0.59	5	Agree
Open banking API standards implementation	3.76	0.68	6	Agree
Blockchain/ DLT exploration for remittances	3.54	0.82	7	Somewhat Agree

Note: Items in bold exceeded the "Strongly Agree" threshold (M ≥ 4.20).

Dimension 3: Financial Consumer Protection

The panel verified the necessity of CBY oversight in consumer protection (M = 3.82), prioritizing active monitoring of institutional compliance with customer rights (M = 3.95).

Dimension 4: Financial Education and Awareness

Participants confirmed the impact of financial literacy initiatives (M = 3.87), noting their direct correlation with improved consumer investment decision-making (M = 4.07).

Descriptive Analysis: Dimensions of the Financial Inclusion Strategy

As demonstrated in Table 11, the strategy dimensions were uniformly rated as highly important (M = 3.91), with MSME financing (M = 3.96) and Islamic microfinance (M = 3.95) emerging as the most critical priorities.

Table 10: Descriptive Statistics for Financial Inclusion Strategy Dimensions.

Rank	Dimension	M	SD	Agreement
1	Financing MSMEs	3.96	0.56	Agree
2	Islamic microfinance	3.95	0.50	Agree
3	Economic empowerment of women and youth	3.87	0.60	Agree
4	Financial and economic infrastructure	3.85	0.48	Agree
	Overall Strategy Importance	3.91	0.47	Agree

Inferential Analysis: Ranking of NFIS Priority Dimensions

Study Question: "Is there a statistically significant

difference in how experts rank the four NFIS priority dimensions?"

Friedman Test Results.

Statistic	Value
N	41
Chi-Square (χ^2 r)	18.742
df	3
Asymp. Sig.	< 0.001*
Kendall's W (Agreement)	0.152 (Weak-Moderate agreement)

The Friedman test indicates significant differences in ranking patterns across the four strategy dimensions (χ^2 r (3) = 18.742, p < 0.001). However, Kendall's coefficient of concordance (W = 0.152) suggests only weak-to-moderate agreement among experts on the exact ordering, indicating some divergence of opinion while maintaining overall consensus on the high importance of all dimensions.

Mean Ranks (Lower = Higher Priority).

Dimension	Mean Rank
Financing MSMEs	2.15 (Highest priority)
Islamic Microfinance	2.34
Women/ Youth Empowerment	2.72
Financial Infrastructure	2.79 (Lowest relative priority)

Post-Hoc Wilcoxon Signed-Rank Tests (Bonferroni-adjusted).

Comparison	Z	Adj. Sig.	Direction
MSMEs vs. Infrastructure	-3.124	0.002	MSMEs ranked higher
Islamic Microfinance vs. Infrastructure	-2.891	0.009	Islamic MF ranked higher
MSMEs vs. Women/ Youth	-2.156	0.093	NS (trend toward MSMEs)
Islamic MF vs. Women/ Youth	-1.874	0.213	NS

Cross-Category Analysis: Professional vs. Academic Experts

Study Question: "Do perceptions of CBY's role differ significantly based on experts' professional background?"

Kruskal-Wallis H Test Results.

Dimension	H (df = 2)	p-value	Eta ²	Interpretation
Legislative Framework	3.847	0.146	0.047	NS
FinTech	8.923	0.012*	0.109	Significant
Consumer Protection	2.156	0.340	0.026	NS
Financial Education	5.678	0.058	0.069	NS (marginal)
Overall CBY Role	7.234	0.027	0.089	Significant

Note: *** $p < .05$.

Follow-Up Mann-Whitney U Tests (FinTech Dimension).

Comparison	U	Z	p (adj.)	Direction
Professional vs. Academic	184.5	-2.671	0.008	Professionals rate higher (M = 4.18 vs. 3.84)
Professional vs. Hybrid	156.2	-1.892	0.123	NS
Academic vs. Hybrid	142.8	-0.987	0.598	NS

Professional practitioners (bankers, regulators, and MFIs) assign significantly higher importance to FinTech than academic experts ($M_{diff} = 0.34$, $p = .008$). This suggests practitioners perceive immediate operational value in digital transformation that academics may view more theoretically. This finding has important policy implications: NFIS design should weigh practitioner input heavily when prioritizing FinTech interventions.

5. Discussion

The empirical findings yield substantial insights into the CBY's requisite operational posture in engineering an NFIS. The consistently high aggregate rating of the CBY's role ($M = 3.91$) corroborates global paradigms wherein central banks operate as the fundamental anchoring institutions for financial stabilization and inclusivity (Abdelmonem & Qalloul, 2021). This finding is strongly supported by Demirgüç-Kunt et al. (2018), who demonstrated through the global finindex database that institutional financial governance and central bank policy interventions are among the most influential determinants of financial inclusion levels in developing economies. Similarly, Ozili (2020) argued that effective regulatory coordination by central banks significantly enhances access to formal financial services, particularly within fragile and low-income states characterized by institutional instability. Notably, the tight confidence intervals around this mean (95% CI: [3.79, 4.03]) indicate

strong consensus with minimal dispersion, suggesting that despite Yemen's political fragmentation, experts converge on the CBY's centrality to any viable inclusion strategy.

From a theoretical perspective, the findings support multidimensional financial inclusion frameworks which conceptualize financial inclusion as an integrated ecosystem involving regulatory governance, digital innovation, consumer protection, financial literacy, and inclusive financing mechanisms (Ozili, 2020; Demirgüç-Kunt et al., 2018).

The prominence attributed to FinTech ($M = 4.01$) is particularly salient. The ANOVA results confirm this is not merely numerical precedence but represents a statistically and practically significant distinction ($p < 0.001$, $\eta^2 = 0.186$). It underscores a paradigm shift recognizing digital financial ecosystems as non-negotiable instruments for circumventing the infrastructural deficits characteristic of Yemen's current economic geography. The current findings also align with the broader digital financial inclusion literature emphasizing that FinTech ecosystems reduce geographical exclusion, transaction costs, and informational asymmetries. Tay et al. (2022) concluded that digital financial platforms play a transformative role in extending financial services to underserved populations and accelerating progress toward sustainable development goals. Likewise, Mavlutova et al. (2022) found that digital transformation enhances financial sector resilience, operational efficiency, and financial accessibility, especially in economically vulnerable environments. This aligns closely with Rashwan and Qasim (2021), who argue that digital transformation is the primary vector for accelerating inclusive finance.

Furthermore, the discovery that professional practitioners rate FinTech significantly higher than academics ($U = 184.5$, $p = 0.008$) offers a nuanced interpretation: those closest to operational realities, managing branch networks, processing transactions, serving customers, perceive digital tools not as optional innovations but as survival imperatives in a context where physical infrastructure has deteriorated. In the Yemeni context, this digital orientation acquires even greater strategic importance due to the deterioration of physical banking infrastructure caused by prolonged political and economic instability. Consequently, digital financial channels may represent not merely a complementary mechanism, but rather the principal pathway for achieving scalable financial inclusion under conflict-sensitive conditions. Policymakers should therefore temper purely theoretical

assessments with practitioner-grounded evidence when allocating resources to FinTech initiatives.

Furthermore, the rigorous prioritization of MSME financing ($M = 3.96$) alongside Islamic microfinance ($M = 3.95$) reveals an acute awareness among the expert panel regarding the sociocultural determinism of financial behavior in Yemen. The Friedman test confirms that these enterprise-focused dimensions outrank pure infrastructure investment ($\chi^2 r = 18.742, p < 0.001$), suggesting that experts adopt a demand-led conceptualization of inclusion that prioritizes capital deployment to productive enterprises over mere physical presence expansion. Addressing these dimensions simultaneously targets both the acute capital constraints of the real economy and the religious/cultural preferences that dictate user adoption.

This interpretation is consistent with the broader financial inclusion literature emphasizing the importance of productive financing mechanisms in reducing poverty and stimulating local economic development. Ozili (2020) noted that access to financing for micro and small enterprises constitutes a core pillar of inclusive economic growth, particularly within developing economies characterized by high levels of informal economic activity.

While consumer protection ($M = 3.82$) and financial education ($M = 3.87$) received marginally lower relative ratings, their absolute scores confirm them as indispensable complementary pillars. The absence of a significant difference between these two dimensions (Tukey $p = 0.737$) implies experts view them as functionally equivalent in strategic importance; neither should be privileged at the expense of the other. Sustainable financial inclusion is contingent not merely on accessibility, but on the safe, informed, and resilient utilization of financial products by newly banked populations.

The importance assigned to financial literacy and consumer protection is also supported by Khan et al. (2022), who identified financial education as a foundational determinant of sustainable financial inclusion. Their study demonstrated that financially literate individuals are more likely to utilize banking products responsibly and participate in formal financial systems. In parallel, Duvendack and Mader (2019) emphasized that consumer protection frameworks are essential for ensuring trust, reducing exploitation risks, and enhancing the long-term effectiveness of financial inclusion policies.

Despite the strong consensus regarding the CBY's strategic role, the findings should be interpreted within the broader structural constraints affecting

Yemen's financial ecosystem. Unlike relatively stable developing economies examined in previous financial inclusion studies, Yemen faces compounded challenges including political fragmentation, weak institutional coordination, deteriorating infrastructure, limited telecommunications coverage, and low public trust in formal financial institutions. These contextual realities may constrain the practical implementation capacity of financial inclusion policies despite their conceptual and strategic relevance. Therefore, the success of the proposed NFIS depends not only on regulatory design, but also on broader institutional stabilization, infrastructure rehabilitation, and sustained international technical support.

Compared with regional experiences such as Egypt and Jordan, where national financial inclusion strategies benefited from relatively stable institutional environments and advanced digital banking ecosystems, Yemen's financial inclusion trajectory remains uniquely constrained by conflict-related disruptions. Nevertheless, the findings suggest that adaptive FinTech solutions, Islamic microfinance mechanisms, and decentralized digital payment systems may provide viable alternatives capable of partially compensating for conventional infrastructure deficiencies.

However, unlike several developing economies where financial inclusion expansion has been primarily associated with stable institutional environments and mature banking infrastructure, the Yemeni case demonstrates that financial inclusion strategies within fragile and conflict-affected states require fundamentally different implementation logics. While previous studies frequently assume the existence of functioning regulatory coordination, reliable payment systems, and institutional trust, the current findings indicate that these assumptions are only partially applicable in Yemen. Consequently, the present study extends the existing literature by emphasizing that financial inclusion in conflict-sensitive environments must prioritize institutional resilience, adaptive digital mechanisms, and decentralized service delivery models rather than relying exclusively on conventional banking expansion approaches.

Nevertheless, the interpretation of the findings should consider certain contextual limitations, including the ongoing political fragmentation, restricted financial data availability, and the rapidly evolving nature of Yemen's institutional environment. These factors may influence the generalizability and long-term operationalization of the proposed strategy. Overall, the findings indicate

that effective financial inclusion strategies in fragile and conflict-affected states require adaptive, digitally-oriented, and institutionally resilient policy architectures capable of addressing both structural exclusion and sociocultural financial barriers simultaneously.

5.1. Proposed Financial Inclusion Strategy for Yemen

Financial inclusion serves as a master lever for catalyzing sustainable economic and social development in Yemen, facilitating efficient, equitable, and secure access to formal financial markets. Grounded in the empirical findings of this study, including the statistically confirmed primacy of FinTech ($F = 8.924, p < 0.001$) and the practitioner-academic divergence in technology prioritization, the subsequent strategic framework is designed to amplify the CBY's institutional efficacy.

1. Vision

To achieve sustainable, universal financial inclusion that actively propels equitable and inclusive socioeconomic development across all segments of Yemeni society.

2. Mission

To orchestrate equitable and responsible access to formal financial services by leveraging FinTech innovations, deploying enabling regulatory policies, and cultivating cross-sectoral partnerships to cement economic resilience.

3. Strategic Objectives

Accessibility: Radically expand financial service touchpoints for marginalized demographics in both rural and urban peripheries.

Empowerment: Economically mobilize women and youth via tailored credit facilities and sustained capacity-building initiatives.

Digitalization: Accelerate FinTech integration to compress transaction costs, elevate service fidelity, and stimulate localized product innovation.

Literacy: Institutionalize financial education focusing on prudent savings, holistic financial planning, and cyber-secure banking practices.

Governance: Overhaul legislative and supervisory architecture to guarantee systemic integrity, corporate transparency, and robust consumer protection.

Sustainability: Embed green finance and broader SDG principles directly into the macroeconomic policy framework.

Synergy: Forge resilient operational partnerships between the CBY, commercial intermediaries, and civil society actors.

Cultural Alignment: Scale Islamic microfinance

structures to resonate with Yemen's socio-religious context.

Enterprise Growth: Fortify micro and small enterprise viability through frictionless access to capital and strategic advisory services.

4. Strategic Pillars

Equity and Fairness: Guaranteeing non-discriminatory access to formal financial channels.

Sustainability: Harmonizing immediate economic imperatives with long-term social and environmental viability.

Holistic Inclusiveness: Ensuring geographically and sectorally comprehensive policy deployment.

Centralized Leadership, Decentralized Execution: The CBY retains strategic command while empowering stakeholders in operational execution.

Technological Innovation: Prioritizing digital solutions to collapse logistical barriers.

Consumer Centricity: Anchoring policy around the protection and education of the end-user.

5. Implementation Matrix: Objectives and Operational Framework

The successful execution of the national financial inclusion strategy (NFIS) depends on a structured operational matrix that aligns strategic objectives with concrete procedures and designated implementing entities. This framework is categorized into five primary pillars:

Pillar 1: Expanding Financial Access.

This objective focuses on two main trajectories. First, increasing the physical and agency presence in rural areas through the deployment of mobile banking units and the establishment of retail agency banking protocols. The Central Bank of Yemen (CBY) and the commercial banking sector lead this effort. Second, the strategy mandates an upgrade of digital infrastructure. This involves developing interoperable e-payment switches and enhancing telecommunications networks in remote zones, requiring a synergistic partnership between the CBY and the ministry of communications.

Pillar 2: Demographic Empowerment.

The strategy prioritizes youth and women through the design of agile credit products, such as collateral-light micro-loans and dedicated enterprise support funds. These are implemented by banks, FinTechs, and the ministry of social affairs. To ensure sustainability, the strategy integrates operational capacity building, including management and accounting training and the launch of university-linked incubators, coordinated by the ministry of higher education and various NGOs.

Pillar 3: Leveraging FinTech Ecosystems.

To modernize payment ecosystems, the CBY and

FinTech actors aim to launch a unified national e-wallet and scale mobile money interoperability. Simultaneously, the strategy works to compress service costs by subsidizing or eliminating digital transaction fees and incentivizing digital adoption campaigns to encourage a shift from cash-based to digital transactions.

Pillar 4: Enhancing Financial Literacy and Security.

Cultivating a national savings culture is driven by Omni-channel media campaigns and the integration of financial literacy into national curricula, led by the ministries of information and education. To protect these gains, the strategy includes measures to mitigate cyber and fraud risks through digital security workshops and the distribution of anti-fraud content by the CBY and NGOs.

Pillar 5: Strengthening Governance and Regulation.

Modernizing financial statutes is essential, involving the revision of banking and microfinance laws and the promulgation of explicit consumer protection edicts by the CBY and the ministry of finance. Furthermore, institutional integrity is enforced through centralized grievance mechanisms and expanded oversight to include shadow banking entities, managed by the financial supervisory authority.

Table 11: Implementation Responsibility Matrix (RACI).

Strategic Objective	CBY	Commercial Banks	Govt. Ministries	NGOs	Intl. Orgs	Telecoms
Rural Branch Expansion	A/R	R	C	C	I	I
Digital Infrastructure Upgrade	A/R	C	C	I	R	R
Youth/Women Credit Products	C	R	R/A	R	I	I
National E-Wallet Launch	A/R	R	C	I	C	R
Financial Literacy Campaigns	C	C	R/A	R	I	I
Regulatory Modernization	A/R	C	R	I	I	I
Islamic MF Product Dev	C	R	C	R	I	I

R = Responsible, A = Accountable, C = Consulted, I = Informed.

5.2. Phased Strategy Implementation Flow

To ensure rigorous execution, the strategy follows

a sequential five-phase lifecycle. It begins with the preparation and foundation phase, characterized by the formation of steering committees, baseline macroeconomic analysis, and extensive stakeholder consultations. This leads to the design and formulation phase, where the vision and mission are crystallized, pillars are defined, and key performance indicators (KPIs) are established.

The third phase, implementation and funding, involves translating the strategy into operational plans, securing budgetary allocations, and delegating tasks to specific institutional actors. Following this, the approval and launch phase ensures executive review, formal ratification, and a public sector-wide rollout. Finally, the monitoring, evaluation, and development phase provides continuous KPI tracking, impact assessments, and iterative policy refinement to maintain strategic alignment.

5.3. Foundations of the Implementation Axes

The implementation framework is structured around foundational axes designed to build a resilient and inclusive financial ecosystem:

1. Financial and Economic Infrastructure

The efforts are directed toward fortifying the national financial infrastructure to ensure macroeconomic stability. This includes expanding the footprint of financial institutions in marginalized geographies, modernizing digital infrastructure, and deploying centralized credit-risk databases to mitigate information asymmetry and facilitate micro-financing.

2. Financing MSMEs

The strategy emphasizes the design of concessional credit facilities with flexible collateral requirements. A key action is the establishment of a sovereign MSME financing fund, co-sponsored by the CBY and financial intermediaries, alongside the institutionalization of Sharia-compliant credit guarantee schemes to de-risk startup lending.

3. Economic Empowerment of Women and Youth

This axis focuses on engineering agile financing products tailored to the operational realities of women and youth entrepreneurs. By eliminating bureaucratic hurdles in bank account formulation and sponsoring cooperative financing associations under CBY oversight, the strategy fosters entrepreneurial innovation and inclusion.

4. Islamic Microfinance Development

Given the local context, the strategy seeks to amplify public awareness of Islamic finance as a tool for social justice. This involves developing sharia-compliant microfinance products that align with

religious values and integrating green finance principles to support environmentally sustainable micro-projects.

5. Monitoring and Governance Mechanisms

Accountability is ensured through the constitution of a national financial inclusion committee in the CBY. This body oversees a centralized national database for real-time monitoring and deploys regulatory incentives for institutions that achieve high inclusion metrics.

5.4. Strategic Key Performance Indicators (KPIs) and 2030 Targets

To measure the efficacy of the NFIS, a matrix of quantifiable targets has been established for the 2030 horizon. The strategy aims to achieve a financial access rate where the proportion of adults possessing a formal transactional account is $\geq 70\%$. In the domain of microfinance, the target is for $\geq 60\%$ of small projects to be successfully financed through formal channels.

Geographic inclusion is also a priority, with a target of $\geq 50\%$ for the share of financial branches and services operating in rural areas. Regarding human capital, the strategy seeks to raise the overall financial awareness level to $\geq 75\%$. Finally, to ensure system integrity and trust, a target of $\geq 90\%$ has been set for the annual resolution rate of formally lodged consumer grievances.

5.5. Expected Outcomes of Strategic Implementation

The disciplined execution of the proposed NFIS is anticipated to yield profound macroeconomic and social dividends, specifically:

Poverty Alleviation: A substantive reduction in poverty and unemployment metrics driven by democratized access to capital for individuals and MSMEs.

Macroeconomic Resilience: The cultivation of inclusive, sustainable economic growth through the optimization of productive financial circulation and capital allocation.

Social Cohesion: Enhanced socio-economic stability achieved by integrating historically marginalized populations into the formal economic architecture.

Monetary Efficacy: A structural enhancement in the transmission mechanisms of the CBY's monetary policy, facilitated by a broader, formalized, and transparent financial base.

Gender and Youth Parity: The definitive economic empowerment of women and youth, translating into elevated labor force participation and

entrepreneurial output.

SDG Alignment: The synchronized advancement of economic, social, and environmental sustainability imperatives in Yemen.

5.6. Conclusion

This study substantiates the indispensable role of the central bank of Yemen (CBY) in architecting and executing a national financial inclusion strategy. The expert consensus heavily endorses the CBY's capability to anchor financial system stability while driving inclusive growth. With an overall mean rating of 3.91 (SD = 0.38, 95% CI [3.79, 4.03]) and no individual dimension falling below the "Agree" threshold, the empirical foundation for CBY's leadership role is robust.

The empirical findings reveal that robust legislative and supervisory frameworks constitute the bedrock of the strategy, ensuring systemic trust and operational integrity. Furthermore, financial technology (FinTech) is unequivocally identified as the primary catalyst for scaling financial inclusion, confirmed through both descriptive (highest M = 4.01) and inferential (ANOVA F = 8.924, $p < .001$, $\eta^2 = 0.186$) analyses, serving to compress transaction costs and bypass traditional infrastructural deficits.

This study also affirms the multidimensional nature of financial inclusion in Yemen. While upgrading macroeconomic infrastructure and supporting MSMEs are recognized as universal drivers of local growth, targeted interventions, such as the economic empowerment of women and youth, and the strategic expansion of Islamic microfinance, are deemed critical to navigating the specific sociocultural landscape of Yemen. The Friedman test results ($\chi^2 r = 18.742$, $p < 0.001$) validate that experts distinguish meaningfully between these dimensions, with enterprise financing taking precedence over pure infrastructure investment, a finding with direct resource allocation implications.

Ultimately, the CBY's proactive engagement in consumer protection and financial literacy ensures that expanded access safely translates into sustainable economic empowerment. However, the practitioner-academic divergence observed in FinTech prioritization ($p = 0.008$) serves as a cautionary note: strategy design must incorporate diverse stakeholder perspectives to avoid blind spots inherent in homogeneous expert panels.

5.7. Recommendations

Based on the empirical findings and the proposed strategic framework, this study outlines the following actionable recommendations for

policymakers:

1. Fortify the CBY's operational autonomy and governance architecture to optimize the efficacy of monetary policies and insulate supervisory functions from political friction. Specifically, enshrine CBY independence in constitutional or primary legislation, modeled on international best practices (e.g., Article 123 of the ECB Protocol).

2. Continuously calibrate financial legislation to proactively accommodate digital finance innovations and sustainable development paradigms.

3. Incentivize aggressive investment in secure digital banking ecosystems and interoperable e-payment networks to exponentially expand financial outreach. Given the significant practitioner-academic gap identified ($p = 0.008$), establish a joint CBY-industry FinTech task force ensuring operational realities inform regulatory design.

4. Formulate a national financial education mandate, executed synergistically with media conglomerates and the Ministry of Education, to cultivate prudent financial behaviors.

5. Institute a specialized administrative unit in the CBY exclusively tasked with coordinating the design, execution, and KPI monitoring of the financial inclusion strategy. This unit should comprise both CBY staff and seconded experts from commercial banks, MFIs, and telecom operators to ensure multi-stakeholder representation.

6. Reorient developmental finance programs to explicitly target rural and historically underserved communities.

7. Stimulate MSME growth via the deployment of concessional lending facilities, agile credit guarantee mechanisms, and continuous post-disbursement advisory support.

8. Engineer inherently flexible financial products and capacity-building pipelines specifically addressing the structural barriers faced by women and youth.

9. Aggressively expand mobile and digital financial touchpoints to capture unbanked populations outside the traditional branch network.

10. Restructure and expand Islamic microfinance mechanisms to ensure strict alignment with immediate poverty-alleviation and sustainable development priorities.

11. Given resource constraints, implement recommendations in the following priority sequence based on statistical findings: (a) Immediate (Year 1): FinTech infrastructure + Regulatory sandbox establishment; (b) Short-term (Years 1-2): MSME credit guarantee fund + Islamic MF product development; (c) Medium-term (Years 2-3): Financial

literacy national campaign + Rural expansion; (d) Long-term (Years 3-5): Full ecosystem maturation + SDG alignment monitoring.

5.8. Suggestions for Future Research

To further enrich the academic discourse and policy formulation regarding financial inclusion in Yemen, future research should aim to:

1. The empirically investigate the specific contributions of commercial and Islamic banking institutions to the realization of the SDGs in the Yemeni context.
2. Quantitatively assess the causal impact of digital financial transformation on macroeconomic development and the speed of financial inclusion adoption.
3. An explore the structural relationship between corporate governance mechanisms within financial institutions and the downstream efficacy of national inclusion policies.
4. Develop an integrative, econometric model that synthesizes financial inclusion metrics, governance indices, and sustainability indicators to optimize monetary policy formulation in fragile economic states.
5. An establish a baseline measurement of financial inclusion indicators in Yemen (using the dimensions validated in this study) and conduct follow-up assessments at 24-month intervals to track NFIS implementation progress.
6. An extend this study design to other Fragile and Conflict-Affected States (e.g., Syria, Somalia, Afghanistan) to identify common patterns and context-specific differentiators in NFIS development.
7. Given the underrepresentation of female experts in this study (14.6%), conduct dedicated qualitative research (in-depth interviews, focus groups) with women entrepreneurs, female financial service users, and women bankers to capture gender-specific barriers and enablers not fully represented in the current expert panel.
8. Following the strong FinTech prioritization identified, investigate specific behavioral, infrastructural, and regulatory obstacles to digital financial service adoption among Yemen's unbanked population using mixed-methods approaches.

5.9. Study Limitations and Methodological Constraints

While this study provides valuable insights into

the CBY's role in NFIS development, several limitations must be acknowledged to contextualize the findings appropriately:

1. Sample-Related Limitations

Expert Panel Composition Bias: Despite rigorous eligibility criteria application, the final panel exhibited notable demographic skewness:

Gender Imbalance: Only 14.6% female representation ($n = 6$), reflecting but potentially amplifying the male-dominated nature of Yemen's financial sector leadership. Gender-specific perspectives on financial inclusion (particularly regarding women's empowerment dimensions) may be underrepresented.

Diaspora Overrepresentation: 22% of experts reside outside Yemen, potentially introducing bias toward theoretical/international best-practice orientations rather than grounded operational realities.

Sectoral Concentration: Heavy representation from commercial banking (34.1%) may overshadow perspectives from informal financial providers, telecommunications companies, and civil society organizations, who are crucial NFIS stakeholders.

Sample Size Considerations: While $n = 41$ falls in the acceptable range for Delphi studies (typically 15-50 experts; Okoli & Pawlowski, 2004), it limits the statistical power for complex multivariate analyses and subgroup comparisons. Some post-hoc tests may have failed to detect smaller effect sizes (Type II error risk).

2. Methodological Limitations

Delphi Technique Constraints:

Consensus Pressure: The iterative feedback mechanism, while promoting convergence, may exert subtle pressure toward group conformity, potentially suppressing legitimate minority viewpoints or innovative contrarian positions.

Anonymity Trade-off: While anonymity reduces dominance bias, it prevents assessment of responders' institutional affiliations, potentially influencing their judgments (though partially addressed through demographic collection).

Static Nature: The Delphi approach captures point-in-time expert perceptions; rapidly evolving conditions in Yemen (security, political, economic) may alter priorities before publication or implementation.

Cross-Sectional Design: Data collection occurred over a 12-week period (September-November 2023). The single time-point design precludes causal inference and cannot capture temporal dynamics in expert opinion formation.

Self-Report Measures: All data rely on expert self-

report, which carries risks of:

1. Social desirability bias (responding in professionally normative rather than personally held views).
2. Recency bias (overweighting recent events/experiences).
3. Halo effect (general positive disposition toward CBY influencing specific dimension ratings).

3. Contextual Limitations

Yemen's Operational Environment

Access Constraints: Security considerations prevented inclusion of experts from certain governorates (e.g., Hodeidah, Saada, and Marib), potentially omitting important regional perspectives.

Dual Authority Complexity: Experts operating under the internationally recognized government (Aden-based) versus the de facto authority (Sana'a-based) may hold divergent views on CBY's actual operational capacity, which the anonymous format cannot disentangle.

Data Scarcity: Absence of reliable official financial inclusion statistics (e.g., percentage of banked adults, account ownership rates) prevented validation of expert perceptions against objective baselines.

Generalizability Constraints:

Findings are specific to the Yemeni context and may not transfer directly to other Arab countries, developing economies, or conflict-affected states without adaptation.

The expert-centric approach captures elite/stakeholder perspectives but does not represent the end-user viewpoint (actual unbanked individuals whose inclusion is the ultimate goal).

4. Mitigation Strategies Employed

To partially address these limitations, the researchers implemented the following measures:

1. Triangulation of findings with international best-practice frameworks (World Bank, AFI).
2. Transparent reporting of all demographic distributions to enable the reader's assessment of representativeness.
3. Inclusion of the "Unable to Assess" option to reduce forced-response bias.
4. Multiple rounds allow for opinion revision after reflection.
5. Explicit acknowledgment of limitations to prevent over interpretation.

5. Recommendations for Interpreting Findings

Given the above limitations, readers and policymakers should interpret this study's findings as:

1. Directionally indicative rather than precisely definitive.

2. Expert-informed hypotheses requiring validation through implementation pilots.
3. Contextually bounded to Yemen's current institutional configuration (subject to change with political resolution).
4. Complementary to rather than a replacement for end-user research and quantitative baseline assessments.
5. Future research should address these limitations through longitudinal designs, mixed-methods approaches incorporating end-user perspectives, and larger, more demographically balanced expert panels.

Declarations

Ethical Considerations

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki and the standard ethical guidelines for social science research. All participants were informed of the study's purpose, the voluntary nature of their involvement, and their unconditional right to withdraw at any stage without consequence. Verbal and written informed consent was obtained from each expert prior to data collection. The anonymity of the participants was preserved throughout the research process; identifying information was removed, and all responses were coded to ensure confidentiality. The data collected were used exclusively for the purposes of this research and were not shared with any third party. Ethical approval was granted by the Research Ethics Committee of the Inclusive Development Research Center, Sana'a University (Approval Reference: Center Council Administrative Approval).

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