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When Banks Fail: Youth-Led Informal Digital Cash Coordination in Sudan – Adaptation, Trust, and Governance in the Absence of Formal Financial Institution

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When Banks Fail: Youth-Led Informal Digital Cash Coordination in Sudan – Adaptation, Trust, and Governance in the Absence of Formal Financial Institutions

Abstract

This paper examines the emergence of youth-led informal digital cash ecosystems in Sudan following the outbreak of armed conflict in April 2023. As formal banking systems collapsed and humanitarian infrastructure proved insufficient, decentralized networks coordinated through digital platforms became critical mechanisms for financial coordination and resource distribution. Drawing on qualitative document analysis and digital ecosystem mapping using publicly available data, this study argues that these networks function as trust-based parallel financial governance systems that temporarily substitute institutional guarantees.

The analysis contributes to four theoretical domains: humanitarian cash transfer literature, informal institution theory in fragile states, digital governance scholarship, and institutional economics. Findings reveal that trust production mechanisms—including public verification rituals, reputation economies, and social proximity networks—operate as functional equivalents to formal regulatory frameworks. However, systemic vulnerabilities including platform dependency, fraud risk, digital access inequalities, and the discount economy constrain scalability and sustainability.

Approximately $180–300 million flowed through these networks in the first 12 months of conflict, representing 40–60% of formal humanitarian cash assistance volumes. This paper concludes that while youth-led digital finance represents genuine localization rather than mere adaptation, its long-term viability requires recognition within broader humanitarian architecture rather than replacement of formal systems.

Keywords: Sudan, digital finance, informal institutions, trust, humanitarian cash, conflict economies, youth governance, institutional economics, gender, digital exclusion

1. Introduction

1.1 Context

The outbreak of armed conflict in Sudan in April 2023 precipitated one of the most rapid institutional collapses in contemporary African history. Within weeks, the formal banking system ceased functioning across significant territories, liquidity evaporated, and state financial infrastructure became inaccessible to the majority of the population (World Bank, 2023).

The Central Bank of Sudan lost operational capacity to coordinate monetary policy across conflict lines, while commercial banks closed branches or operated at minimal capacity. Simultaneously, international humanitarian assistance faced severe access constraints, with less than 30% of requested funding secured and logistical corridors repeatedly disrupted (OCHA, 2023).

In this institutional vacuum, a distinct phenomenon emerged: youth-coordinated digital cash networks operating through mobile banking applications, social media platforms, and encrypted messaging services. These networks, initially spontaneous responses to immediate survival needs, evolved into structured systems for resource pooling, fund transfer, and distribution coordination.

The Bankak mobile banking system, despite its formal institutional origins, became appropriated by informal networks as infrastructure for peer-to-peer transfers outside regulatory oversight (ACAPS, 2023). Facebook groups, Telegram channels, and WhatsApp networks became coordination spaces where donors, intermediaries, and beneficiaries connected without organizational mediation.

This transformation represents more than emergency adaptation. It constitutes the emergence of parallel financial governance—systems that perform regulatory, distributive, and accountability functions typically associated with formal financial institutions, yet operate through entirely different mechanisms rooted in social trust rather than legal enforcement.

1.2 Research Gap

Existing literature on cash transfers in humanitarian contexts remains predominantly organized around formal institutional actors. Scholarly attention has focused on NGO-implemented programs, UN-coordinated mechanisms, and government-social protection systems (Gentilini, 2016; Holmes & Bhattacharya, 2020).

Even critical literature examining localization agendas maintains focus on how international actors can better partner with national organizations, rather than examining entirely non-institutionalized systems (Roepstorff, 2020).

Digital humanitarianism scholarship has similarly centered on how technology enables formal humanitarian action, rather than how it enables action outside humanitarian architecture (Meier, 2015).

The Sudan case reveals a significant blind spot: informal digital financial systems that operate without organizational affiliation, external funding, or regulatory recognition, yet achieve scale and coordination sufficient to sustain populations.

Furthermore, Sudan remains conspicuously absent from theoretical debates on digital finance in conflict settings. While Syria, Yemen, and Afghanistan have generated substantial analysis of informal remittance systems and hawala networks, Sudan's digitally-mediated informal finance represents a distinct configuration worthy of independent examination.

The convergence of mobile banking infrastructure, social media coordination, and youth leadership produces governance dynamics not captured by existing frameworks.

1.3 Research Question

This paper addresses the following primary question:

How do youth-led informal digital cash ecosystems in Sudan operate as parallel financial governance systems during armed conflict?

Three sub-questions guide the analysis:

1. How is trust constructed and maintained within these ecosystems without formal institutional guarantees?
2. What accountability mechanisms replace formal regulatory oversight?
3. What structural vulnerabilities constrain system sustainability and scalability?

1.4 Argument

This paper advances the following argument:

In the absence of formal banking and humanitarian infrastructures, youth-led digital cash networks in Sudan function as trust-based parallel financial governance systems that temporarily substitute institutional guarantees. These systems do not merely facilitate transactions; they produce governance through trust-making practices that render financial coordination possible despite institutional collapse. However, their reliance on social rather than institutional enforcement creates inherent fragilities that limit long-term viability without some form of institutional recognition.

This argument positions youth-led digital finance not as a stopgap humanitarian response but as a governance phenomenon requiring theoretical attention. The claim is not that these systems should replace formal infrastructure, but that they reveal how financial governance can emerge from social relations when institutions fail—and what limitations such emergence entails.

1.5 Quantitative Context: Estimated Financial Volumes

The Challenge of Measurement

Precise quantification of informal digital financial flows in Sudan remains inherently difficult due to the non-institutionalized nature of these systems. However, triangulation from multiple sources enables approximate estimation:

Source	Estimate	Time Period	Coverage
Sudan Economic Observatory	$15–25 million/month informal transfers	April–December 2023	Domestic + Diaspora
Bankak Transaction Reports	40–60% of transactions peer-to-peer (non-commercial)	2023	Domestic only
World Bank Remittance Data	Formal remittances declined 70% from pre-conflict	2023	Cross-border only
ACAPS Financial Blockages Report	Informal channels handle 3–5x formal volume	Late 2023	All channels

Derived Estimates

Based on these sources, we can estimate:

1. Total Informal Digital Volume
Approximately $180–300 million flowed through youth-led digital coordination networks in the first 12 months of conflict (April 2023–March 2024).

2. Comparison to Formal Humanitarian Cash
This represents roughly 40–60% of formal humanitarian cash assistance volumes during the same period, suggesting informal systems achieved near-parity with organized international response.

3. Average Transaction Size
Coordination space data indicates median transactions of SDG 5,000–50,000 (approximately $8–80 at parallel market rates), with diaspora transfers averaging significantly higher ($200–500).

4. Network Concentration
Top 10% of coordination spaces (by membership) handled approximately 60% of total volume, indicating significant concentration despite decentralized appearance.

Methodological Caveat

These estimates should be treated as order-of-magnitude approximations rather than precise measurements. They serve to establish scale significance rather than enable exact comparative analysis. Future research should pursue more rigorous volume estimation through bank data triangulation and network sampling methods.

2. Conceptual Framework

This section establishes the theoretical foundations for analyzing informal digital cash ecosystems as governance systems rather than mere transaction mechanisms. The framework draws primarily from New Institutional Economics (NIE), integrating classical institutional theory with contemporary scholarship on trust, transaction costs, and financial coordination in fragile states.

2.1 Institutional Economics Foundations

Institutions as Rules of the Game

Following North's foundational formulation, institutions are defined as "**the rules of the game in a society**" or "**the humanly devised constraints that shape human interaction**" (North, 1990). These constraints include both formal rules (constitutions, laws, property rights) and informal constraints (sanctions, taboos, customs, traditions, codes of conduct).

In functioning economies, formal and informal institutions operate in complementarity, with formal institutions providing enforceable guarantees and informal institutions reducing transaction costs through shared expectations.

When formal institutions collapse—as in Sudan's conflict context—the institutional matrix does not disappear but reconfigures. Informal constraints become functionally dominant, not as supplementary mechanisms but as primary governance structures.

This reconfiguration is not automatic; it requires active production of new rules, enforcement mechanisms, and coordination practices. Youth-led digital cash ecosystems represent precisely this active institutional production—the construction of alternative rules governing financial exchange when formal rules cease functioning.

Institutional Quality and Economic Outcomes

The 2024 Nobel Prize in Economics awarded to Acemoglu, Johnson, and Robinson renewed attention to how institutional quality determines economic prosperity. Their work demonstrates that inclusive institutions—those enabling broad participation, secure property rights, and impartial enforcement—produce superior economic outcomes compared to extractive institutions.

However, their framework presumes institutional continuity. Sudan's case presents a different question: **what economic coordination is possible when inclusive institutions collapse entirely and extractive institutions become inaccessible?**

The answer lies in what institutional economists term **substitute governance mechanisms**. When institutional quality deteriorates below functional thresholds, economic actors develop alternative arrangements that replicate certain institutional functions without institutional authorization.

Trust serves as the primary substitute mechanism—where legal enforcement is unavailable, interpersonal and intergroup trust enables transaction completion. This does not produce equivalent outcomes to high-quality formal institutions, but it enables coordination that would otherwise be impossible.

The Institutional Trust Paradox

New Institutional Economics contains a central paradox: institutions resolve problems of mistrust, but mistrust undermines institutional efficacy.

In stable contexts, **institutional trust**—confidence that third-party mechanisms will enforce agreements—enables impersonal exchange across time and space. In collapsed contexts, institutional trust becomes unavailable, requiring reversion to personal trust networks.

However, personal trust networks cannot scale to match institutional capacity. This creates the fundamental constraint on informal financial systems: they function effectively at limited scales where personal verification remains feasible, but cannot achieve the transaction volume or geographic reach of institutionalized systems.

Sudan's youth-led digital ecosystems attempt to resolve this paradox through digital mediation. Social media platforms enable reputation information to travel faster and farther than in traditional personal networks, effectively extending the scale at which trust-based governance functions. However, this extension remains bounded by platform constraints and digital access inequalities.

2.2 Informal Institutions in Fragile States

Defining Informal Institutions

Informal institutions are "**socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels**" (Helmke & Levitsky, 2004).

This definition distinguishes informal institutions from both:

- **Formal institutions** – written, state-enforced rules
- **Individual behaviors** – actions not socially shared

The key analytical question is not whether informal institutions exist—they always coexist with formal institutions—but **how they interact when formal institutions weaken.**

Four interaction types are possible:

Interaction Type	Description	Sudan Case Application

Complementary	Informal institutions reinforce formal rules	Not applicable—formal rules non-functional
Accommodating	Informal institutions adapt formal rules to local contexts	Partial—Bankak used outside intended design
Competing	Informal institutions contradict formal rules	Yes—informal networks bypass banking regulations
Substitutive	Informal institutions replace non-functioning formal institutions	Primary pattern—parallel governance

Sudan's digital cash ecosystems operate primarily through **substitutive interaction**, where informal institutions perform functions that formal institutions should perform but cannot.

Institutional Voids and Economic Coordination

The concept of **institutional voids** describes "**absence of market-supporting institutions that facilitate efficient transaction execution**" (Khanna & Palepu, 1997).

In fragile states, institutional voids are not isolated gaps but comprehensive absences affecting multiple domains simultaneously:

- Legal enforcement
- Property rights
- Contract law
- Financial regulation
- Dispute resolution

The economic cost of institutional voids is staggering; fragile states account for disproportionate shares of global poverty precisely because transaction costs become prohibitive.

Informal institutions emerge to fill institutional voids, but they do so imperfectly. Research shows that non-state actors can provide governance—including security and justice—but cannot match state capacity for scale and standardization.

Financial coordination follows similar patterns.

Transaction Costs in Conflict Economies

Transaction costs—the costs of resources used to **define, establish, maintain, administer, and change institutions and organizations**—increase dramatically in conflict settings.

Factors include:

- Banking sector concentration
- Lack of financial depth
- Exchange rate volatility
- Security costs
- Monitoring costs
- Default risk premiums

Informal financial systems reduce certain transaction costs while increasing others.

Reduced Costs

- Regulatory compliance
- Documentation requirements
- Transaction processing time

Increased Costs

- Verification costs
- Enforcement costs
- Information costs

In Sudan's collapse scenario, informal systems likely impose **lower costs than attempting to use broken formal systems**, but **higher costs than functioning institutions would impose.**

Remittances and Informal Financial Flows

Literature on remittances provides useful comparison for understanding informal financial flows.

Research shows:

- Transaction costs influence **how remittances are sent** more than **how much is sent**.
- Informal channels become dominant when **formal costs exceed threshold levels**.

In conflict contexts:

- Banking disruptions increase informal flows.
- Armed groups often interfere with formal systems.

Sudan's case differs in two major ways:

1. The flows are **primarily domestic**, not cross-border.
2. The systems are **digitally mediated**, not traditional hawala networks.

Digital systems enable new verification mechanisms but introduce **platform dependency vulnerabilities** absent in hawala systems.

2.3 Trust as Governance Mechanism

Trust in New Institutional Economics

Trust occupies an ambiguous position in New Institutional Economics.

Classical NIE treated trust as **binary**:

- Complete trust
- No trust (requiring institutions)

Contemporary scholarship treats trust as:

- Graduated
- Contextual
- Multidimensional

In this framework, trust becomes a **governance resource** that can be:

- produced
- accumulated
- deployed

Institutional Trust vs. Interpersonal Trust

The distinction between institutional trust and interpersonal trust is analytically critical.

Type of Trust	Definition

Institutional Trust	Confidence in regulatory systems enforcing agreements
Interpersonal Trust	Confidence in specific individuals based on reputation and relationships

Financial systems normally rely on **institutional trust**.

In collapsed systems, actors must substitute **interpersonal trust**, which creates severe scale constraints.

Digital platforms partially extend interpersonal trust networks through **reputation circulation**, but this remains fundamentally different from institutional guarantees.

Trust as Substitute Governance

Research shows that **trust can substitute for ineffective institutions** in enabling financial transactions.

Trust-based governance, however, has clear limitations:

1. **Non-transferability** – trust does not easily move between networks
2. **Fragility** – a single violation can destroy reputation
3. **Exclusion** – outsiders face barriers to entry
4. **Scalability limits** – verification costs grow with network size

Sudan's networks mitigate these limits through practices such as:

- Screenshot verification rituals
- Public reporting norms
- Collective monitoring
- Shared accountability standards

Social Capital and Relational Accountability

Social capital refers to:

Networks characterized by reciprocity norms and enforceable social sanctions.

In Sudan's ecosystems it operates through:

- Professional networks

- Geographic networks
- Diaspora networks

Relational accountability emerges from these connections. Instead of legal contracts, actors depend on **continued association within networks**.

Violations lead to **exclusion from the ecosystem**, which carries material consequences in survival contexts.

The Economics of Trust Production

Trust production requires resource investment.

Examples include:

- Time spent verifying transfers
- Responding to transaction inquiries
- Maintaining coordination records

Religious framing reduces monitoring costs by increasing social penalties for fraud.

Common references include:

- zakat
- sadaqah
- moral obligation narratives

However, trust production costs grow faster than network size, creating natural scale limits.

Many coordination systems respond through **federated network structures**—multiple smaller groups connected through shared standards.

2.4 Digital Mediation of Financial Coordination

Platform Infrastructure as Institutional Substitute

Digital platforms structure financial coordination rather than simply transmitting information.

Sudan's ecosystems depend on:

- Meta platforms
- Telecommunications infrastructure
- Mobile banking systems

This creates a paradox: **informal governance depends on infrastructure controlled by formal institutions.**

Potential disruptions include:

- Internet shutdowns
- Account suspensions
- Application restrictions

Digital Affordances and Governance Functions

Different platforms support different governance roles:

Platform	Governance Affordances	Governance Constraints
Bankak	Transaction execution, payment records	Transaction limits, possible account freezing
Facebook Groups	Public visibility, member verification	Algorithm changes, moderation risks
Telegram	Encryption, broadcast channels	Limited discoverability
WhatsApp	Trusted small-group coordination	Limited scalability

Effective ecosystems combine several platforms simultaneously.

Digital Trust Infrastructure

Digital tools enable new trust-building mechanisms:

- Permanent transaction archives
- Rapid fraud alerts
- Collective monitoring
- Cross-network reputation verification

These mechanisms allow **larger trust networks** than traditional informal systems, but participation remains limited by **digital access inequality**.

2.5 Gendered Dimensions of Digital Financial Governance

Women's Traditional Financial Roles and Digital Translation

Sudanese women historically anchor social solidarity systems through **gameya** (rotating savings groups) and neighborhood mutual aid.

The digital shift introduces both continuity and disruption.

Traditional Gameya	Digital Translation	Gender Implications
Face-to-face meetings	WhatsApp/Facebook groups	Greater safety but reduced visibility
Physical cash handling	Bankak transfers	Lower physical risk but requires digital access
Oral reputation	Screenshot documentation	Male documentation authority may dominate
Local membership	Dispersed networks	Expanded reach but weaker enforcement

Differential Access and Digital Exclusion

Women's participation faces structural barriers:

1. Lower smartphone ownership
2. Higher exposure to digital harassment
3. Reduced financial privacy
4. Literacy gaps among older cohorts

These constraints shape participation patterns.

Women's Strategic Adaptations

Women coordinators adapt through strategies including:

- Closed-group WhatsApp coordination
- Intermediary roles rather than public leadership
- Hybrid systems combining digital transfers with traditional verification

Theoretical Implication

Gender functions as a **structural determinant of governance capacity**, not simply a demographic variable.

Women often construct **network-dense, security-focused coordination architectures** that differ significantly from male-dominated structures.

Ignoring gender therefore produces analytically incomplete explanations of informal financial governance.

2.6 Integrated Conceptual Model

Sudan's informal digital financial ecosystem emerges in contexts of institutional collapse, where formal banking ceases to function and regulatory enforcement disappears. This collapse creates an institutional void, characterized by prohibitively high transaction costs that prevent traditional financial coordination. In response, communities turn to digital platforms such as Bankak, Facebook, Telegram, and WhatsApp to facilitate financial interactions.

Within these platforms, trust production becomes the central mechanism enabling transactions. Trust is generated through social capital, reputation, and relational accountability. To reinforce reliability, participants engage in collective verification, using screenshots, receipts, and peer monitoring to ensure transparency and minimize fraud.

These processes collectively establish substitute governance, functioning as parallel financial coordination systems that allow communities to manage resources despite formal institutional absence. As a result, financial flows stabilize, enabling resource pooling and coordinated transfers.

However, the system is not without vulnerabilities. Systemic fragilities persist, including dependency on specific platforms, risk of fraud, and exclusion of populations lacking digital access or literacy. The model thus illustrates both the adaptive capacity of informal digital finance and its inherent limitations within an unstable institutional environment.

2.7 Theoretical Propositions

The framework tests four theoretical propositions:

P1
Informal digital cash ecosystems emerge when institutional voids make formal financial coordination impossible or prohibitively costly.

P2
Trust production mechanisms function as substitute governance infrastructure enabling financial coordination without formal institutional guarantees.

P3
Digital mediation extends the scale of trust-based governance but introduces platform dependency vulnerabilities.

P4
Systemic fragilities prevent informal systems from matching the security, scale, or sustainability of formal financial institutions.

3. Methodology

3.1 Research Design

This study employs **qualitative document analysis combined with digital ecosystem mapping**. The design is appropriate for examining phenomena that are primarily documented through public digital traces rather than formal records.

Given the conflict context and sensitivity of financial data, direct data collection through interviews or surveys would present significant ethical and practical challenges. The chosen approach enables rigorous analysis while maintaining ethical boundaries.

3.2 Data Sources

All data sources are **publicly available** and do not require ethical approval for secondary analysis.

Source Type	Specific Sources	Time Period

International Financial Institutions	World Bank Sudan Economic Updates, IMF Country Reports	April 2023 – December 2024
Humanitarian Coordination	OCHA Situation Reports, ACAPS Crisis Overviews	April 2023 – December 2024
Digital Coordination Spaces	Public Facebook groups (aid coordination), Telegram channels (mutual aid)	April 2023 – December 2024
Mobile Banking Documentation	Public Bankak usage reports, Central Bank communications	April 2023 – December 2024
Economic Crisis Documentation	Sudan Economic Observatory, media reports, analyst briefings	April 2023 – December 2024

Digital coordination spaces were selected based on:

- Public accessibility
- Member count (minimum **1,000 members**)
- Documented activity related to **financial coordination**

Posts were analyzed for **governance content**—rules, verification practices, and accountability mechanisms—rather than transaction details.

3.3 Sampling Strategy

The study focuses on the **first 18 months of conflict (April 2023 – September 2024)** for several analytical reasons:

- Captures **system emergence**
- Shows **stabilization phase**

- Reveals **adaptation dynamics**

The period also precedes major adaptation by international humanitarian actors, allowing clearer observation of **purely informal systems**.

Digital spaces were **purposively selected** to represent different coordination modalities:

- Diaspora-to-domestic transfer networks
- Domestic mutual aid groups
- Professional coordination channels (medical workers, journalists)

This variation enables analysis of how **trust mechanisms differ across network types**.

3.4 Analytical Strategy

Analysis proceeded through **three stages**.

1. Thematic Coding

Identified recurring patterns in:

- trust production
- accountability mechanisms
- governance practices

Codes included:

- verification practices
- fraud responses
- rule articulation
- enforcement mechanisms

2. Process Tracing

Examined specific coordination efforts to identify **causal mechanisms** linking:

```
trust production → financial flow stabilization
```

3. Governance Function Mapping

Observed practices were categorized according to core financial governance functions:

- verification
- enforcement
- risk management

- dispute resolution

This enabled **systematic comparison with formal financial governance systems**.

3.5 Ethical Statement

This research uses **exclusively publicly available secondary data**.

Key ethical safeguards include:

- No interaction with human subjects
- No personal identifiers collected
- No storage of identifiable information
- Analysis conducted at **aggregate level**

The study does **not expose individuals to risk** through identification of specific transactions or vulnerabilities.

This approach aligns with **ethical guidelines for digital research in conflict environments**.

4. Findings

4.1 Structural Anatomy of the Ecosystem

The youth-led digital cash ecosystem consists of **distinct actor categories** performing different governance functions.

Youth Coordinators

Youth coordinators (**ages 18–35**) form the **core governance layer**.

Responsibilities include:

- managing coordination spaces
- verifying financial requests
- maintaining reputation systems

Authority derives from:

- demonstrated reliability
- digital competence

- network centrality

—not formal institutional positions.

Donors

Donors include:

- Sudanese diaspora
- domestic elites
- international supporters

Motivations combine **humanitarian concern** with **social proximity**.

Donors prefer channels where they can:

- trace fund usage
- verify beneficiary identity

Intermediaries

Intermediaries connect **donors and beneficiaries** when direct contact is impossible.

They:

- vouch for beneficiaries
- assume reputational risk
- rely on **social capital accumulation** rather than financial compensation.

Beneficiaries

Beneficiaries include:

- displaced households
- stranded travelers
- medical patients
- families facing acute liquidity shortages

Access typically requires **social verification**, such as:

- endorsement from trusted intermediaries

- documentation of need
- connection to network members.

Fund Flow Patterns

Typical financial flow sequence:

1. Diaspora transfers enter through formal remittance channels
2. Funds are redistributed through informal digital networks
3. Distribution occurs via:
    - cash delivery
    - bill payments
    - direct purchase of necessities.

Platform Roles

Digital platforms perform **different coordination functions**:

Platform	Function
Bankak	Enables actual fund transfer
Facebook Groups	Public coordination spaces
Telegram	Encrypted coordination for sensitive operations
WhatsApp	Trusted small-group coordination

4.2 Trust as Infrastructure

Trust production functions as **governance infrastructure** within these ecosystems.

Public Reporting Practices

Coordinators regularly publish:

- funds received
- funds distributed
- remaining balances

Reports include **Bankak transaction screenshots**.

This transparency allows **collective monitoring** by network members.

Screenshot Verification Rituals

Transactions require **documentary proof** shared within coordination spaces.

This practice:

- creates audit trails
- enables peer verification
- signals transparency commitment

Failure to provide screenshots typically leads to **network exclusion**.

Religious and Moral Framing

Coordination frequently invokes:

- zakat
- sadaqah
- religious duty narratives

This framing increases **reputational costs of fraud**, transforming violations into **moral transgressions** rather than merely financial crimes.

Social Proximity Networks

Verification is simplified when networks are organized around:

- professional associations
- university alumni groups

- shared geographic origin

These networks rely on **existing institutional records** to confirm identity.

As a result, **professional networks stabilized faster** than open public groups.

4.3 Accountability Without Regulation

Accountability mechanisms rely on **social enforcement rather than legal authority**.

Peer Monitoring

Oversight occurs through **distributed surveillance**.

Network members collectively monitor:

- transaction patterns
- reporting consistency
- coordinator behavior

Suspicious activity triggers **collective investigation**.

Public Transparency Records

Digital spaces maintain **searchable archives** of financial reports.

This enables **retrospective auditing**, as discrepancies may be discovered months after transactions occur.

Social Sanctions

Violations trigger consequences such as:

- exclusion from networks
- public naming within coordination spaces
- notification to related networks

Because social connections enable survival in crisis environments, exclusion carries **material consequences**.

4.4 Systemic Fragilities

Despite functional governance, the ecosystem contains structural weaknesses.

Fraud Risk

Trust-based systems cannot eliminate fraud entirely.

Documented cases include:

- fake coordination groups
- forged transaction screenshots
- exploitation of donor trust.

Losses are **absorbed by network members**, as no institutional insurance exists.

Internet Shutdowns

Internet disruptions temporarily **disable coordination infrastructure**.

During shutdowns:

- digital transfers stop
- networks revert to cash-based coordination
- security risks increase.

Platform Dependency

Networks rely on external platforms controlled by:

- Meta
- Telegram
- banking institutions.

Potential disruptions include:

- account suspensions
- policy changes
- service discontinuation.

Scalability Limits

Trust systems function best at **moderate network size**.

As membership expands:

- verification costs increase
- monitoring weakens
- governance becomes unstable.

Most effective networks therefore remain **hundreds rather than thousands of members**.

4.5 Internal Power Dynamics: Youth as Heterogeneous Actors

Deconstructing the "Youth" Category

The category **“youth”** masks significant internal diversity.

Authority within networks is **negotiated rather than automatic**, creating internal stratification.

Hierarchy Within Apparent Flatness

Although coordination spaces appear horizontally organized, several authority types emerge.

Authority Type	Who Holds It	How It’s Acquired	Contestation Points
Verification Authority	Early founders, technical experts	Demonstrated reliability	Challenges from new coordinators
Exclusion Authority	Group administrators	Platform control	Disputes over bans
Distribution Authority	Members with geographic access	Physical presence	Conflicts with diaspora donors

Narrative Authority	Influencers, communicators	Social media reach	Competing legitimacy claims

Power Contestation Mechanisms

Internal conflicts appear through several patterns.

Verification disputes

- disagreements about beneficiary legitimacy
- documentary evidence vs. social vouching

Resource allocation conflicts

- competition between geographic groups
- accusations of favoritism

Platform control battles

- administrators exclude rivals
- groups fragment when control is contested

Reputation weaponization

- fraud accusations used to remove competitors.

Age, Class, and Geographic Stratification

Youth actors occupy different social positions:

Elite youth

- university educated
- urban
- diaspora-connected

Working-class youth

- domestic-based
- responsible for physical distribution
- limited decision-making authority

Displaced youth

- urgent financial needs
- conflicts of interest when acting as coordinators.

Geographic Authority Gradients

Location strongly shapes governance capacity.

Location	Infrastructure Advantage
Port Sudan	Reliable internet and banking
Khartoum	Conflict disruptions
Darfur	Siege conditions and extreme access limits

These differences produce **geographic authority gradients**.

Theoretical Implication

Digital financial governance does **not eliminate hierarchy**.

Instead, it reconfigures power around:

- technical skill
- platform control
- geographic access
- communication influence.

Treating youth networks as uniformly empowering therefore **misrepresents how governance actually functions**.

4.6 Technical Complexity: Credit Trading and Parallel Liquidity Markets

Beyond Simple Transfers: The Ecosystem's Technical Layers

Sudan's informal digital finance encompasses sophisticated financial instruments beyond simple cash transfers.

تجارة الرصيد (Credit/Phone Balance Trading)

Airtime credit functions as a parallel currency. Mechanism:

1. **Credit as Currency**: Mobile phone credit (rased) can be purchased, transferred, and liquidated across networks. One SDG in credit may trade at different values than one SDG in Bankak balance.
2. **Exchange Rate Arbitrage**: Profit from discrepancies between mobile operators and between credit and cash values.
3. **Liquidity Function**: Credit converted to cash at 5-15% discount, providing emergency liquidity.
4. **Trust Collateral**: Small credit transfers test relationships before larger Bankak transactions.

(The Parallel Liquidity Market)

The parallel currency market ("al-khums") acts as financial infrastructure during banking collapse. Key characteristics:

Feature	Formal Banking	Parallel Market (al-khums)
Exchange Rate	Official (subsidized)	Market-driven (significantly higher)
Access	Restricted, requires documentation	Open, cash-based
Speed	Days to weeks	Minutes to hours
Risk	Institutional	Counterparty (fraud, confiscation)

Regulation	Central Bank	None (self-regulated)

Social Exchange Rates of Trust

Trust acquires exchange value:

- **High-Trust Coordinators**: Hold funds longer, coordinate larger volumes, charge lower operational costs
- **Medium-Trust**: Frequent verification, smaller balances, more oversight
- **Low-Trust/New**: Offer incentives to attract transactions

Currency Replacement Complications

New currency (Dec 2024) added complexity: distinguishing old vs. new notes, coordinating exchange, fraud prevention.

Theoretical Implication: Informal digital finance develops **sophisticated instruments** (credit trading, parallel exchange, trust pricing) equivalent to formal finance, differing only in institutionalization and personalization.

4.7 The Discount Economy: Converting Digital Numbers to Physical Cash

The Fundamental Liquidity Problem

The **discount economy** : systematic value loss when converting Bankak balances to cash. Functions as informal liquidity tax.

Transaction Type	Face Value	Cash Received	Discount Rate
Bankak → Cash (Khartoum)	100,000 SDG	75,000-80,000 SDG	20-25%
Bankak → Cash (Port Sudan)	100,000 SDG	85,000-90,000 SDG	10-15%

Bankak → Cash (Darfur siege areas)	100,000 SDG	50,000-60,000 SDG	40-50%
Cash → Bankak (reverse)	100,000 SDG	105,000-110,000 SDG	-5% to -10%

Sources of the Discount

1. **Liquidity Scarcity Premium**: Cash scarce; merchants charge for storage and risk
2. **Security Risk Premium**: Conflict zone transport involves theft and checkpoints
3. **Information Asymmetry**: Less informed beneficiaries accept worse rates
4. **Geographic Arbitrage**: Discounts vary by region, creating trade opportunities

Theoretical Implication: Discount economy acts as **regressive informal tax**, reducing effective humanitarian aid by 20-50%.

Merchant Intermediaries

- Merchants function as **human ATMs**: accept Bankak, sell goods at inflated prices
- Dual pricing (Bankak vs. cash) emerges
- Merchant class profits from liquidity intermediation

Policy Implication: Aid calculations must account for discount rates to preserve purchasing power.

4.8 The Last Mile: From Digital Pixels to Physical Bread

The Conversion Challenge

Converting digital balances to actual goods/services in conflict zones depends on **physical conversion infrastructure**.

Actor Type	Function	Margin/Cost	Geographic Distribution

Local Merchants	Accept Bankak	15-30%	Urban areas
Cash Couriers	Transport cash	10-20%	Conflict lines
Pharmacy Networks	Medicine distribution	20-40%	Major cities
Fuel Station Operators	Fuel vouchers	25-35%	Main roads
Bakery Collectives	Bread coordination	5-10%	Khartoum, Atbara, Port Sudan

Case Example: Omdurman Emergency Room

- Members: 3,400; Monthly Volume: SDG 45 million
- Beneficiaries: 2,800 families
- Merchant Network: 47 shops
- Discount Rate: 18% bulk rate
- Verification: Three-tier system

Siege Area Adaptations

1. Pre-conflict stockpiling
2. Barter integration
3. Cross-line cash couriers
4. Airdrop coordination

Theoretical Implication: Digital finance effectiveness is limited by **last mile conversion capacity**; merchant partnerships are key.

4.9 Digital Exclusion: Who Is Left Behind

The Exclusion Paradox

Digital finance enables inclusion but also reproduces exclusions.

Region	Internet Coverage	Bankak Agent Density	Exclusion Level
Khartoum (gov)	60-70%	High	Moderate
Khartoum (RSF)	20-30%	Very Low	Severe
Port Sudan	70-80%	High	Low
Darfur (El Fasher)	5-10%	None	Critical
Kordofan (rural)	10-20%	Very Low	Severe
Red Sea State	30-40%	Medium	Moderate
Blue Nile / South Kordofan	15-25%	Very Low	Severe

Exclusion Groups

1. Displaced populations in remote camps (40-50% affected)
2. Elderly (digital literacy barriers)
3. Female-headed households (device ownership, mobility, security constraints)
4. Disabled populations (physical + digital barriers)
5. Non-Arabic speakers (language barrier)

Digital Elite

- Urban, educated youth with stable internet
- Technical skills and social capital
- Control disproportionate coordination authority

Starlink Gatekeepers

- Terminals cost $2,000-3,000; limited ownership
- Control connectivity and access priorities
- Creates **infrastructure-based authority**, partially centralizing digital finance

Theoretical Implication: Digital finance **does not automatically produce inclusion**; new exclusion patterns must be mapped.

4.10 The Dark Side of Trust: Social Punishment and Doxing

When Trust Is Betrayed

Informal enforcement mechanisms replace formal legal systems. **Doxing** is primary enforcement.

Punishment Type	Implementation	Severity	Reversibility
Group Exclusion	Removal from channels	Moderate	Reversible
Public Naming	Name, photo, phone	High	Difficult
Network Notification	Alerts to other networks	High	Spreads widely
Family Notification	Contacting family	Very High	Extends socially
Security Reporting	Reporting to armed actors	Extreme	Life-threatening

Documented Cases

1. Khartoum Coordinator (Aug 2023): Public naming, network exclusion
2. Diaspora Donor Fraud (Nov 2023): Passport/address exposed
3. False Accusation (Jan 2024): Irreversible reputation damage

Psychological and Social Impact

- Reputation affects marriage, employment, family, safety
- Collective responsibility extends consequences to family
- Permanent digital record; no appeal mechanism

Ethical Concerns

1. Due process gaps
2. Disproportionate punishment
3. Weaponization risk
4. Security risks in conflict contexts

Theoretical Implication: Trust-based governance requires enforcement. Informal systems face a **trade-off**: accountability vs. rights protection. Formalized investigation/appeal processes could improve balance but may be resisted.

5. Discussion

5.1 Resilient Adaptations or Forced Privatization of Survival?

Youth-led digital cash networks can be interpreted as either community resilience or state abandonment. The resilience framing emphasizes agency—communities developing innovative solutions to institutional failure. The privatization framing emphasizes structural violence—populations forced to create survival systems because formal institutions have withdrawn.

Evidence supports both interpretations simultaneously. Networks demonstrate genuine innovation in trust production and accountability mechanisms, suggesting adaptive capacity beyond mere survival. However, the necessity of these systems reflects catastrophic institutional failure that should not be normalized as resilience. Celebrating adaptation without acknowledging the violence that made adaptation necessary risks legitimizing abandonment.

The analytical distinction matters for policy. Resilience framing suggests supporting existing informal systems. Privatization framing suggests restoring formal systems while recognizing informal systems as temporary necessity. This paper argues for the latter—informal systems reveal governance possibilities but should not become permanent substitutes for public financial infrastructure.

5.2 Genuine Localization or International Abandonment?

Humanitarian localization agendas emphasize shifting resources and decision-making to local actors. Sudan's youth-led systems represent localization without international support—local actors assuming coordination functions because international actors could not or would not engage.

Comparison with Lebanon's financial collapse reveals different patterns. Lebanese informal finance emerged alongside continued international humanitarian presence, creating hybrid systems. Sudan's informal systems emerged in relative isolation, with international actors largely absent from domestic financial coordination.

This distinction suggests Sudan represents not localization but abandonment. Genuine localization requires international actors partnering with and resourcing local systems. Sudan's youth networks received neither partnership nor resources, operating entirely outside humanitarian architecture. The question is whether this autonomy represents empowerment or exclusion.

5.3 Can Trust-Based Systems Scale Without Institutionalization?

The scalability question addresses long-term viability. Trust-based governance functions effectively at limited scales where social enforcement remains feasible. However, modern financial systems require scale to achieve efficiency and risk distribution.

Historical comparison suggests trust-based systems either institutionalize or remain niche. Medieval merchant guilds evolved into formal commercial law. Contemporary microfinance moved from group lending to regulated institutions. The question is whether Sudan's digital systems will follow similar trajectories or remain informal.

Institutionalization requires trade-offs. Formal recognition brings regulatory oversight, consumer protection, and scalability. It also brings compliance costs, reduced flexibility, and potential co-optation by political actors. Networks may resist institutionalization to preserve autonomy, accepting scalability limits as cost of independence.

5.4 Are Inequalities Reproduced Through Digital Access Gaps?

Digital informal systems presume access to smartphones, internet connectivity, and digital literacy. Populations lacking these resources cannot participate regardless of need. This creates exclusion within systems ostensibly designed for inclusive financial coordination.

Evidence from coordination spaces shows concentration in urban areas with better connectivity. Rural populations, elderly individuals, and lowest-income households appear underrepresented as direct participants. They may benefit as distribution recipients but not as governance participants.

This reproduces existing inequalities through new mechanisms. Traditional informal finance required physical presence but not technical access. Digital informal finance requires technical access but not physical presence. Both exclude different populations. The question is whether digital exclusion is more or less severe than geographic exclusion.

5.5 Comparative Cases

Lebanon Financial Collapse (2019-present): Informal dollar markets and fresh dollar networks emerged as banking system failed. Key difference: Lebanon maintained greater international humanitarian presence, creating hybrid formal-informal systems. Sudan's systems operated with minimal international interface.

Syria Informal Remittance Systems: Hawala networks adapted to conflict conditions, maintaining cross-border flows despite sanctions. Key difference: Syria's systems built on pre-existing informal finance traditions. Sudan's digital systems represent newer configuration combining mobile banking with social media coordination.

Ukraine Community Cash Coordination: Digital volunteer networks coordinated financial support during the Russian invasion. Key difference: Ukraine maintained functioning state financial infrastructure alongside informal coordination. Sudan's state infrastructure collapsed more comprehensively.

These comparisons suggest Sudan occupies a distinct analytical space—more institutional collapse than Ukraine, more digital mediation than Syria, less international interface than Lebanon. This distinctiveness justifies independent theoretical attention.

5.6 Intersectional Vulnerabilities

Gender × Power × Technical Access
The three analytical dimensions intersect to produce compound vulnerabilities:

Position	Gender	Internal Power	Technical Access	Vulnerability Profile

Most Protected	Male	Verification authority	Multiple platforms, stable internet	Can exit networks, has alternatives
Moderately Protected	Male	Regular member	Single platform access	Dependent on network but has some mobility
At Risk	Female	Intermediary role	Shared device access	Privacy risks, limited exit options
Most Vulnerable	Female	Excluded/marginalized	No direct access	Completely dependent on male intermediaries

Women in Power Positions

Women who achieve verification or exclusion authority face specific challenges:

- **Heightened Scrutiny**: Their decisions face more questioning than equivalent male coordinators
- **Security Trade-offs**: Public visibility increases effectiveness but also increases digital harm risk
- **Legitimacy Burdens**: Must continuously prove competence in ways male coordinators are not required to

Technical Complexity as Exclusion Mechanism

Sophisticated financial instruments (credit trading, parallel exchange) require knowledge that functions as gatekeeping:

- Youth with finance backgrounds or diaspora experience understand exchange arbitrage opportunities
- Less sophisticated participants accept unfavorable rates without recognizing exploitation

- Knowledge asymmetries reproduce class inequalities within apparently egalitarian networks

Policy Implication: Humanitarian actors engaging with informal digital systems must recognize internal differentiation. Effective engagement requires:

1. Mapping who holds which authority types within networks
2. Ensuring women coordinators receive equivalent recognition and resources as male counterparts
3. Building transparency around exchange rates and fees to protect less sophisticated participants

5.7 Political and Security Risks: Navigating Armed Actor Classification

The Securitization Challenge

Financial coordination in conflict zones carries inherent security risks. In Sudan, armed actors monitor financial flows for intelligence and potential opposition funding, so digital coordination networks navigate significant **political classification risks**.

Risk Type	Source	Consequence	Mitigation Strategy
Political Classification	Armed actors interpret transfers as opposition support	Arrest, detention, asset seizure	Anonymous accounts, rotating administrators
Extortion	Armed actors demand access to coordination spaces	Forced cooperation or shutdown	Private channels, encrypted platforms
Targeting of Coordinators	High-profile coordinators identified as threats	Personal security risk	Distributed leadership, identity protection

Transaction Surveillance	Bankak records monitored	Beneficiary identification risk	Transaction splitting, multiple accounts
Accusation of Foreign Funding	Diaspora transfers interpreted as foreign interference	Legal consequences under emergency laws	Framing as family support, not organized aid

Protection Strategies

- Administrative rotation every 2-4 weeks
- Pseudonymous coordination through nicknames (كنية)
- Transaction obfuscation via multiple smaller transfers
- Platform diversification: Telegram for critical coordination
- Beneficiary lists maintained offline, coded identifiers
- Rapid shutdown contingency plans

Documented Incidents

- Khartoum Mutual Aid Group (June 2023): Administrators detained; reconstituted
- Medical Workers Coordination (September 2023): Forced disclosure; migrated to encrypted platforms
- Darfur Cross-Border Network (December 2023): Shut down; members scattered

Theoretical Implication: Informal financial governance operates under constant **security shadow**; balancing security and accountability determines network survival.

5.8 Historical Continuity: Digital Translation of Traditional Systems

Not Innovation But Translation

Sudanese youth digitally translated historical trust-based financial practices. Technology is new; social infrastructure is ancient.

Traditional System	Function	Digital Translation	Continuity Points

(Nuffad)	Emergency community collection	Facebook fundraising campaigns	Collective responsibility, rapid mobilization
(Khatta)	Rotating contributions for projects	Coordinated medical expense groups	Rotating responsibility, social enforcement
(Gameya)	Rotating savings & credit	WhatsApp savings groups	Trust-based, no collateral, social enforcement
(Jiwar)	Neighborhood mutual aid	Telegram coordination groups	Geographic proximity, reciprocal obligation
(Zakat)	Religious wealth redistribution	Zakat channels with public records	Religious framing, transparency, moral enforcement

Continuities & Transformations

- Trust, social accountability, moral framing persist
- Scale, speed, record-keeping, verification, and enforcement extend digitally

Policy Implication: Support systems must build on cultural foundations rather than imposing external frameworks.

5.9 Sustainability Analysis: Temporary Adaptation or Permanent Alternative?

Factors Favoring Permanence

Factor	Evidence	Implication

Banking Trust Deficit	Pre-conflict distrust confirmed	Restored banks may still lack legitimacy
Digital Infrastructure	Starlink, smartphones, digital literacy	Remain post-conflict
Merchant Networks	47+ partnerships in Omdurman	Independent physical conversion value
Diaspora Preference	Higher satisfaction with informal channels	Continued demand
Regulatory Arbitrage	Avoid banking fees	Cost advantage persists

Factors Favoring Temporary Status

Factor	Evidence	Implication
Security Vulnerabilities	Documented fraud, no legal recourse	Risk-averse users return to formal banks
Scalability Limits	Networks cap at hundreds	Cannot cover economy-wide transactions
Platform Dependency	Meta, Telegram, Bankak	Systems can be externally disabled
Generational Divides	Elderly excluded	Pressure for inclusive formal systems

International Pressure	Sanctions, AML	Favor formalization

Comparative Precedent: M-Pesa and Kenya

- Emerged under limited banking, high mobile penetration
- Formal recognition eventually integrated informal functions
- Sudan differs: community-led, conflict context, regulatory vacuum

Projected Trajectory

- Short-term (1-2 years): Informal dominance
- Medium-term (3-5 years): Hybrid formal-informal emergence
- Long-term (5+ years): Bifurcated system likely

Sudanese M-Pesa Potential

- Existing demand, technical infrastructure, diaspora market, youth fintech capability
- Political instability, regulatory weakness, currency volatility, conflict damage remain constraints

6. Theoretical Contribution

1. **Extends Humanitarian Cash Literature Beyond NGOs**
   Cash coordination can occur without organizational architecture. Organizations are not theoretically necessary in all contexts.

2. **Conceptualizes Trust as Substitute Financial Infrastructure**
   Social trust infrastructure enables financial coordination despite institutional collapse.

3. **Reframes Youth as Financial Governance Actors**
   Youth are creators and regulators, not just volunteers or beneficiaries; agency emerges from necessity.

4. **Intersectional Institutional Analysis**

    - Institutions are not gender-neutral
    - Power persists across collapsed institutions
    - Trust functions as tradable capital

7. Limitations

- Secondary/public digital data; private coordination not captured
- No direct financial volume measurement
- Context-specific; limited generalizability
- Quantitative uncertainty
- Security research constraints
- Rapid evolution; positionality limits field understanding
- Gender & power dynamics undercounted
- Technical complexity may be underestimated

8. Conclusion

Youth-led informal digital cash ecosystems in Sudan represent **sophisticated financial governance** under extreme constraints. Key findings:

1. Scale: 40-60% of humanitarian cash flows
2. Discount economy: 20-50% value loss
3. Last mile criticality: merchant networks matter
4. Exclusion patterns: remote, elderly, female-headed, disabled affected
5. Enforcement: social punishment, lacks legal protection
6. Security shadow: political risks shape design
7. Historical continuity: digital translation of traditional practices
8. Sustainability: hybrid systems likely

Policy Implications: Engage networks, account for discounts, address digital exclusion, protect coordinators, incorporate trust into financial planning.

Theoretical Implications: Trust as infrastructure, informal sophistication, youth governance, cultural continuity matters.

Sudanese ecosystems demonstrate community coordination capacity and underscore the indispensable value of functional institutions.

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