



MOBILE MONEY ADOPTION AND AGRIPRENEUR PERFORMANCE IN CAMEROON'S RURAL AGRICULTURAL VALUE CHAINS: A MIXED-METHODS STUDY OF COCOA AND MAIZE PRODUCERS

DR. EYONG AKO¹, DR. NJIE IMMACULATE LUM² & DR. MAURICE AYUKETANG NSO³

¹Department of Organisational Sciences, University of Bamenda, Northwest Region, Cameroon, akorolly87@yahoo.com

²Department of Money and Banking, University of Bamenda, Northwest Region, Cameroon, immaculatelum71@gmail.com

³Department of Money and Banking, University of Bamenda, Northwest Region, Cameroon, lordnso@yahoo.co.uk

Corresponding Author Email: akorolly87@yahoo.com
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ABSTRACT

This study examined the relationship between mobile money adoption and agriprenuer performance within Cameroon's cocoa (export cash crop) and maize (domestic food crop) rural agricultural value chains. The study employed an explanatory sequential mixed-methods design across Meme and Fako Divisions (Southwest Region) for cocoa, and Mbam and Kim Divisions (Centre Region) for maize. The quantitative phase surveyed 912 agripreneurs (478 cocoa, 434 maize) using a structured questionnaire. Data were analyzed using descriptive statistics, bivariate comparisons, multivariate regression, interaction term analysis, and Propensity Score Matching. The qualitative phase comprised 40 in-depth interviews and 20 key informant interviews, analyzed using thematic analysis. Results revealed that mobile money adoption was significantly higher among cocoa agripreneurs (44.2%) compared to maize agripreneurs (31.6%). Mobile money adoption was associated with 22-25% higher profits for cocoa and 12-15% higher profits for maize, with adopters demonstrating significantly greater market access, input expenditure, and savings capacity. The interaction term between mobile money and value chain was statistically significant for profit ($\beta=0.124$, $p<0.05$), indicating stronger effects for cocoa. Qualitative findings identified barriers including insufficient agent liquidity, lack of trust, network unreliability, digital illiteracy, and transaction fees. The study concludes that mobile money adoption significantly enhances agriprenuer performance in both value chains, but effects are moderated by value chain characteristics requiring differentiated policy approaches.

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1. Introduction

The intersection of digital technology and financial services has emerged as one of the most transformative developments in contemporary economic history. Across the developing world, mobile money a digital financial service that allows individuals to deposit, send, and withdraw money through their mobile phones has fundamentally altered how millions of people manage their finances, conduct transactions, and participate in the formal economy (Adaba & Chang, 2026). According to the GSMA (2021), Africa constitutes the largest mobile money market globally, with over 621 million active accounts across the continent (Adaba & Chang, 2026).

Within Central Africa, the Economic and Monetary Community of Central Africa (CEMAC) comprising Cameroon, Central African Republic, Chad, Equatorial Guinea, Gabon, and Republic of Congo has witnessed significant but uneven mobile money development. The Bank of Central African States (BEAC) has constructed financial inclusion indicators to track progress within the CEMAC region, organized into four categories: global indicators and indicators derived from three dimensions access, usage, and quality/affordability of financial services (BEAC, 2025).

Cameroon has emerged as the undisputed fintech hub of Central Africa. As documented by The Fintech Times (2026), Cameroon accounts for 63% of all mobile money accounts and processes 77% of transaction value in the CEMAC region. As of 2023, there were approximately 449,000 mobile money agents across the CEMAC region, processing transactions worth €44 billion, representing a 24% increase from the previous year (BEAC, 2025). The mobile money ecosystem in Cameroon is dominated by telecommunications providers such as MTN Mobile Money (MoMo) and Orange Money, which have transformed how millions of Cameroonians send and receive funds (The Fintech Times, 2026). By 2024, revenues generated by mobile money services alone reached 135.8 billion CFA francs (over \$240 million), representing a significant share of the country's telecommunications sector income (The Fintech Times, 2026).

Mobile money is considered the catalyst par excellence of financial inclusion in the CEMAC region due to its openness to all sections of the population and its effectiveness as a rapid, less restrictive, and less costly means of accessing and using financial services (BEAC, 2025). However,

despite these aggregate achievements, Ndip & Kemeni Kambiet (2026) note that unlike East Africa where mobile money penetration is high, in Central Africa and particularly Cameroon, mobile money penetration remains low in absolute terms, and operations are associated with relatively higher transaction costs due to the nature of the market with very few major operators (Atangana Ondo et al., 2023; Douanla Meli et al., 2022).

Agriculture remains the backbone of Cameroon's economy, contributing approximately 23% to GDP and employing over 60% of the active population. The country's agricultural sector is characterized by a dual structure: export cash crops (primarily cocoa and coffee) produced alongside domestic food crops (including maize, cassava, plantain, and yams). This duality creates fundamentally different value chain configurations with distinct implications for mobile money adoption and impact.

Within Cameroon, cocoa and maize represent two fundamentally different agricultural value chains. Cocoa is primarily an export cash crop, characterized by centralized marketing boards, price controls, and certification premiums for quality and sustainability. Maize, conversely, is a domestic food crop traded through fragmented local markets with significant price volatility and post-harvest losses. These structural differences likely mediate the relationship between mobile money adoption and agripeneur performance in distinct ways; however, comparative studies across value chains remain virtually nonexistent.

Access to formal financial services remains a critical constraint for smallholder farmers and agripeneurs across sub-Saharan Africa. In Cameroon, where agriculture contributes approximately 23% to GDP and employs over 60% of the active population, the majority of rural agricultural producers operate outside the formal banking system (Ndip & Kemeni Kambiet, 2026). Traditional financial institutions perceive agricultural lending as high-risk due to income seasonality, lack of collateral, and information asymmetries, leaving rural agripeneurs dependent on informal savings groups and moneylenders who charge exorbitant interest rates.

Mobile money technology has emerged as a potentially transformative solution to this financial exclusion paradox. Cameroon has emerged as Central Africa's undisputed fintech hub, accounting for 63% of all mobile money accounts and processing 77% of transaction value in the CEMAC region (The Fintech

Times, 2026). However, despite this impressive growth, adoption remains disproportionately low in rural agricultural communities. As Ndip and Kemeni Kambiet (2026) note, unlike East Africa where mobile money penetration is high, in Central Africa and particularly Cameroon, mobile money penetration remains low, and operations are associated with relatively higher transaction costs.

The problem this study addresses is twofold. First, despite the theoretical potential of mobile money to enhance agripeneur performance through improved savings mechanisms, reduced transaction costs, and enhanced market access, empirical evidence specifically linking mobile money adoption to agribusiness performance in Cameroon's distinct agricultural value chains remains scarce. Second, existing studies have largely treated the agricultural sector as homogeneous, failing to account for how mobile money's effects might differ across commodity chains with varying market structures, seasonality patterns, and institutional arrangements.

The persistence of cash in agricultural value chains despite the availability of digital alternatives represents a significant economic inefficiency. Waldron et al. (2026) documented that over 90% of farmer-level transactions in Ghana's cocoa value chain remain cash-based, with cumulative losses or value at risk estimated at approximately USD 21.5 million annually. Comparable data for Cameroon is unavailable, but the problem is likely similar. Understanding the barriers to mobile money adoption and the conditions under which adoption improves performance is therefore both an academic priority and a policy imperative.

To address these challenges, this research examined the relationship between mobile money adoption and agripeneur performance within Cameroon's cocoa and maize rural agricultural value chains, with the specific objectives to:

- 1) Assess the extent and patterns of mobile money adoption among cocoa and maize agripeneurs in Cameroon's rural agricultural value chains;
- 2) Determine the relationship between mobile money adoption and key agripeneur performance indicators, including profitability, market access, input utilization, and savings capacity;
- 3) Compare how the mobile money-performance relationship differs between cocoa (export cash crop)

and maize (domestic food crop) value chains, and identify the mechanisms driving any differences; and

- 4) Identify the barriers and facilitators of mobile money adoption among rural agripeneurs in Cameroon.

2. 0 Literature Review

2.1 Conceptual Review

Mobile Money Adoption

Mobile money refers to digital financial services that allow users to store, send, and receive money via mobile phones, operating through a network of agents for cash-in/cash-out transactions. In Central Africa, the agent network has expanded dramatically, with approximately 449,000 mobile money agents operating across the CEMAC region as of 2023 (BEAC, 2025). These agents often small business owners doubling as financial intermediaries processed transactions worth €44 billion in 2023, representing a 24% increase from the previous year (BEAC, 2025).

The mobile money ecosystem in Cameroon is dominated by MTN Mobile Money (MoMo) and Orange Money (The Fintech Times, 2026). Mobile money in Cameroon must be understood within the country's unique linguistic, geographic, and economic context. As a bilingual country (English/French), mobile money USSD interfaces and customer service must accommodate both official languages, potentially creating differential adoption patterns between Anglophone and Francophone regions. The study areas Meme and Fako Divisions (Southwest Region, Anglophone) for cocoa, and Mbam and Kim Divisions (Centre Region, Francophone) for maize—span both linguistic contexts, requiring careful attention to language accessibility in mobile money interfaces.

From my perspective, mobile money adoption in agricultural contexts represents more than just technological adoption it signifies a fundamental shift in how rural producers interact with the formal economy. The distinction between having a mobile money account and actively using it for agricultural transactions is crucial, as many rural agripeneurs may register for mobile money but continue using cash for agricultural transactions. This disconnect between registration and active agricultural usage represents a critical gap that this study sought to understand.

Conceptualizations of mobile money adoption in agricultural contexts distinguish between three usage categories: transactional (payments and transfers), savings (storing value through mobile wallets), and credit (accessing digital loans). This study adopted a multi-dimensional conceptualization of adoption, recognizing that different usage patterns may have heterogeneous effects on agripreneur performance.

Financial Inclusion Conceptualization in the Cameroonian Context

Financial inclusion is defined as the access and usage of basic financial services at an affordable cost (Ndip & Kemeni Kambiet, 2026). In Cameroon, financial inclusion is characterized by a stark duality: while only 12% of adults hold a traditional bank account, an impressive 87% of the adult population has access to financial services through mobile money (BEAC, 2025). This means that mobile money is not merely an alternative to banking in Cameroon it is the primary financial service for the majority of the population.

Despite high national mobile money account penetration, adoption remains disproportionately low in rural agricultural communities. Ndip and Kemeni Kambiet (2026) note that unlike East Africa where mobile money penetration is high, in Central Africa and particularly Cameroon, mobile money penetration remains low in rural areas, and operations are associated with relatively higher transaction costs due to the nature of the market with very few major operators (Atangana Ondo et al., 2023; Douanla Meli et al., 2022). For cocoa and maize agripreneurs in rural Cameroon, being "unbanked" is not an indicator of financial exclusion from mobile money; rather, it reflects the persistent preference for cash in agricultural transactions despite the availability of digital alternatives.

I interpret financial inclusion in the Cameroonian context as a complex phenomenon where infrastructure availability does not automatically translate to meaningful usage. The high mobile money account penetration at the national level masks significant rural-urban disparities and value chain-specific adoption patterns. Financial inclusion for rural agripreneurs must be understood not merely as account ownership but as active engagement with digital financial services that enhance agricultural productivity and market participation.

Agripreneur Performance and Mobile Banking in Agriculture

Agri-entrepreneurship refers to smallholder farmers and agribusiness owners engaged in the production, value addition, and trade of agricultural goods and services (Alobo & Mwesigwa, 2021, as cited in Bongomin et al., 2025). In the Cameroonian context, agripreneurs operate within a dual agricultural system: export cash crop producers (cocoa) and domestic food crop producers (maize). These two categories face fundamentally different market structures, seasonality patterns, and institutional arrangements.

Mobile banking plays a crucial role in agricultural entrepreneurship, contributing to food security, economic growth, and prosperity (Byaruhanga & Opedum, 2015; Pan et al., 2024, as cited in Bongomin et al., 2025). The adoption of mobile banking in agriculture marks a transformative shift in financial operations, leveraging technology to enhance efficiency and sustainable development (Fiedler, 2020; Lalitha & Lavanya, 2022; Parlasca et al., 2022, as cited in Bongomin et al., 2025). This shift facilitates quick access to financial services through mobile devices, enabling agri-entrepreneurs to save time, gain better financial control, and improve food security, employment, and income (Malaquias & Silva, 2020; Mujahed et al., 2020; Parlasca et al., 2022, as cited in Bongomin et al., 2025).

The researcher conceptualises agripreneur performance as a multi-dimensional construct encompassing not only traditional profitability measures but also market access, input utilization, and savings capacity. This broader conceptualization is essential because mobile money's impacts on agricultural enterprises may manifest through multiple pathways. For instance, improved market access through digital payments may not immediately translate to higher profits but can enhance price discovery and reduce transaction costs over time. Similarly, increased input utilization facilitated by mobile payments may lead to productivity gains that ultimately improve profitability.

Digital Finance in Agricultural Value Chains

A value chain encompasses the full range of activities required to bring an agricultural product from production to final consumption. Digital payments have been touted as an antidote to challenges of cash transactions along agricultural value chains (Waldron et al., 2026). In Cameroon, value chains are characterized by spatial fragmentation (production in

rural areas, consumption in urban centers), information asymmetries (farmers lack price information), seasonality (harvest periods concentrate supply), and reliance on informal coordination mechanisms.

Digital finance including online payments, banking, loan processing, and other services accessible by mobile phone or computer can improve the efficiency, transparency, and resiliency of intermediary agrifood firms (Ambler, de Brauw, & Bloem, 2025). These innovations also benefit both producers and consumers: smallholder farmers benefit from reduced transaction costs and receiving higher prices, while more efficient, transparent, and resilient links up and down the value chain can result in lower prices for consumers (*ibid*).

The application of digital finance to agricultural value chains is particularly relevant in Cameroon, where value chains are characterized by fragmentation and informality. Mobile money can potentially address several value chain inefficiencies: reducing transaction costs associated with cash handling, providing secure storage of value during the lean season, enabling faster payment cycles from buyers to producers, and creating transaction histories that can support credit decisions. However, these benefits are likely to materialize differently across value chains depending on their structure, institutional environment, and the nature of transactions.

2.2 Theoretical Literature

2.2.1 Financial Inclusion Theory

Financial inclusion theory posits that access to appropriate financial services enables poor households to manage risk, smooth consumption, and invest in productive activities (Ndip & Kemeni Kambiet, 2026). Nchofoung et al. (2024) apply the public goods theory of financial inclusion, arguing that financial services should be treated as a public good, ensuring unrestricted access and usage for individuals (as cited in Ky, 2025). Like other public goods, digital financial services should be non-excludable and non-rivalrous, ensuring no one is excluded from using them, at least for person-to-person transactions (Ky, 2025). Mobile money is portrayed as a public good, with providers aiming to increase revenue by reaching underserved markets, particularly among the world's poorest, while simultaneously enhancing financial access (*ibid*).

Ky (2025) provides a rigorous empirical investigation using data from the World Bank's Global Findex 2021 across 25 Sub-Saharan African economies. Applying

a logit model with robustness checks including propensity score matching and inverse-probability-weighted regression adjustment, Ky demonstrates that farmers are more likely to adopt mobile money accounts than non-farmers, particularly in rural areas. However, the adoption rate remains below 30%, highlighting the limited transformative effect of mobile money on financial inclusion. The study also finds that mobile money adoption and usage are higher in countries that introduced the service more recently, suggesting that late adopters leverage mobile money services more intensively.

Ndip and Kemeni Kambiet (2026) extend financial inclusion theory by applying it to dietary quality outcomes in Cameroon. Their results show that mobile money operates through increasing the likelihood of engaging in off-farm employment and increased agricultural commercialization. They found that mobile money is positively associated with household diet quality but negatively associated with women's diet quality—a nuanced finding with important policy implications suggesting that while mobile money could be promoted for improved household diet quality, it should be cautiously implemented given its negative associations with women's diets.

Financial inclusion theory provides a foundational understanding of why mobile money matters for agripreneur performance. However, I recognize that the theory's assumption that access automatically leads to usage and improved outcomes is overly simplistic. In the Cameroonian agricultural context, financial inclusion must be understood as a process involving multiple dimensions: access (availability of services), adoption (actual usage), and impact (improved welfare outcomes). This study builds on financial inclusion theory by examining not just whether mobile money is adopted but how its effects vary across value chains with different institutional contexts.

2.2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), posits that two primary constructs determine technology acceptance: perceived usefulness (the degree to which a person believes that using a particular system would enhance their performance) and perceived ease of use (the degree to which a person believes that using a particular system would be free of effort) (Bongomin et al., 2025). TAM emphasizes that user perceptions, rather than objective system characteristics, drive adoption decisions (Bongomin et al., 2025).

TAM is among the most influential models for explaining and predicting individuals' acceptance and use of new technologies, derived from the Theory of Reasoned Action (TRA) (Bongomin et al., 2025). The model's structure provides a straightforward framework for understanding technology adoption, with simplicity allowing researchers to easily operationalize and measure key constructs, making it applicable in diverse settings including rural and agricultural contexts without requiring extensive modifications (Bongomin et al., 2025). TAM emphasizes the importance of user perceptions, which are critical determinants of technology adoption, and effectively links user perceptions to actual usage, providing a clear pathway for understanding how and why users decide to adopt new technologies (Bongomin et al., 2025).

TAM offers a valuable lens for understanding mobile money adoption among agripreneurs by highlighting the role of perceptions. In the Cameroonian agricultural context, perceived usefulness of mobile money likely depends on whether agripreneurs believe the service can address their specific needs such as receiving payments from buyers, paying for inputs, or storing value. Perceived ease of use is particularly relevant in rural areas where digital literacy levels may be low and where language barriers (English/French) may affect the accessibility of USSD interfaces. TAM helps explain why some agripreneurs with access to mobile money services choose not to adopt them: they may perceive limited usefulness for agricultural transactions or find the service difficult to use.

2.2.3 Transaction Cost Economics

Transaction cost economics, developed by Coase (1937) and extended by Williamson (1975, 1985), holds that economic agents seek to minimize the costs associated with exchanging goods and services, including search costs, information costs, bargaining costs, and enforcement costs. Ambler, de Brauw, and Bloem (2025) document that poor digital infrastructure and mobile network coverage in rural areas creates transaction costs that inhibit digital finance adoption.

Transaction cost economics provides the mechanism linking mobile money adoption to agripreneur performance: by reducing transaction costs, mobile money should increase profitability and market efficiency. The use of mobile money and associated mobile wallet platforms requires a reliable and accessible network of agents to facilitate adoption and use. The persistence of cash in business transactions

may stem from multiple sources including the prevalence of online fraud undermining trust in digital technologies. For example, in Nigeria, potential users of digital technologies cited fears of scams (i.e., SIM swaps and phishing attacks) and overcharging by agents who often lack sufficient oversight; a 2023 survey in Nigeria estimated that 2.3 million users had experienced fraud by mobile money agents (Ambler et al., 2025).

Transaction cost economics provides a powerful mechanism for understanding how mobile money adoption affects agripreneur performance. In the cocoa value chain, where transactions involve larger sums and more formalized relationships, transaction costs associated with cash handling (security risks, counting errors, transportation to deposit cash) are substantial. Mobile money can reduce these costs by enabling digital transfers, creating transaction histories, and providing secure value storage. In the maize value chain, where transactions are smaller and more frequent, the transaction cost reduction from mobile money may be less dramatic, but still significant. Transaction cost economics therefore helps explain why mobile money's effects may differ across value chains.

2.2.4 Agricultural Transformation Theory

Theodore Schultz's agricultural transformation theory (1964) argues that smallholder farmers in traditional agricultural systems are "efficient but poor" (Ky, 2025). The constraint on agricultural growth is not farmer inefficiency but rather limited access to modern inputs, technologies, and financial services. Schultz stressed that farmers must be able to adopt innovations, strengthen capital, and build market relationships (Ky, 2025). Agricultural transformation theory provides the ultimate outcome framework: mobile money adoption should not only improve current performance but also catalyze transformation from subsistence to surplus production.

Schultz's theory is particularly relevant to understanding the potential of mobile money to catalyze agricultural transformation in Cameroon. The "efficient but poor" characterization of smallholder farmers applies well to the Cameroonian context, where agripreneurs are often constrained by limited access to financial services rather than by lack of agricultural knowledge or motivation. Mobile money can potentially address several constraints identified by Schultz: access to credit (through transaction histories), access to inputs (through digital payment systems), and market relationships (through digital

marketplaces). However, I recognize that mobile money alone cannot transform agriculture it must be part of a broader package of interventions including extension services, infrastructure development, and market linkages.

2.3 Theoretical Underpinning for the Study

After careful consideration of the four theoretical frameworks reviewed, this study adopted **Transaction Cost Economics** as the primary theoretical underpinning. This choice is justified for several reasons.

First, transaction cost economics provides the most direct mechanism linking mobile money adoption to agripreneur performance. The theory explicitly addresses how reductions in transaction costs through improved information flows, reduced search costs, lower bargaining costs, and enhanced enforcement mechanisms can improve economic outcomes. Mobile money's primary impact on agripreneur performance is through reducing the transaction costs associated with agricultural commerce, including the costs of cash handling, transportation to financial institutions, and the risks associated with carrying cash.

Second, transaction cost economics offers a clear framework for understanding value chain differences. The theory predicts that transaction cost reductions will be more valuable in value chains characterized by higher baseline transaction costs. The cocoa export value chain, with its formalized relationships, larger transaction sizes, and international linkages, likely faces higher transaction costs than the maize domestic food value chain. This explains why mobile money's effects may be more pronounced in the cocoa value chain.

Third, transaction cost economics integrates well with the other theories reviewed. Financial inclusion theory explains why mobile money access matters, but transaction cost economics explains the mechanism through which it improves performance. TAM explains adoption decisions, but transaction cost economics explains why adoption matters for outcomes. Agricultural transformation theory provides the ultimate outcome framework, but transaction cost economics explains how mobile money contributes to transformation.

Fourth, transaction cost economics is empirically testable and has been validated in similar contexts. Studies by Jack and Suri (2011, 2014) in Kenya, Waldron et al. (2026) in Ghana, and Ambler et al.

(2025) in West Africa have all applied transaction cost reasoning to understand mobile money's effects on agricultural outcomes.

2.4 Empirical Review

Wahbi and Musshoff (2024) explored savings behavior and preferences for financial services among smallholder farmers in Mali, Ghana, and Madagascar. Their dissertation uses behavioral economics and discrete choice experiments to understand nuanced preferences of marginalized groups. Mobile Financial Services reduce transaction costs, minimize travel burdens, and provide access to digital credit even for individuals without financial histories. In Sub-Saharan Africa, MFS have become critical savings tools, enhanced economic outcomes, and reduced poverty, particularly among women and other marginalized groups. Yet notable gaps remain in understanding the preferences and needs of underserved populations such as smallholder farmers who are highly vulnerable to income fluctuations and external shocks.

Wahbi and Musshoff's work highlights the importance of understanding farmer preferences for financial services rather than assuming that access automatically leads to adoption. The finding that mobile financial services serve as critical savings tools for marginalized groups is particularly relevant to the Cameroonian context, where formal savings options are limited in rural areas. However, the vulnerability of smallholder farmers to income fluctuations and external shocks suggests that mobile money's benefits may be most pronounced when it enables risk management and consumption smoothing.

Ky (2025) provides the most comprehensive cross-country analysis of mobile money adoption among farmers in Sub-Saharan Africa using individual-level survey data from the World Bank's Global Findex 2021. The study covers 25 Sub-Saharan African economies with nationally representative samples. The results show that farmers are more likely to adopt mobile money accounts than non-farmers, particularly in rural areas. However, the adoption rate remains below 30%, highlighting the limited transformative effect of mobile money on financial inclusion. Farmers primarily use mobile money for saving, borrowing, receiving remittances, and digital payments. The study employs multiple robustness checks including propensity score matching and inverse-probability-weighted regression adjustment methods to address selection bias, providing confidence in the causal interpretation of findings.

Ky's findings provide important context for the Cameroonian case. The finding that farmers are more likely to adopt mobile money than non-farmers suggests that agricultural populations may recognize the potential benefits of digital finance. However, the low overall adoption rate (below 30%) indicates significant barriers remain. The cross-country nature of Ky's study masks important country-specific and value chain-specific variations that this current study addressed by focusing on Cameroon and disaggregating by value chain.

Waldron et al. (2026) documented that over 90% of farmer-level transactions in Ghana's cocoa value chain remain cash-based, with cumulative losses or value at risk estimated at approximately USD 21.5 million annually. This finding from Ghana's cocoa sector provides a relevant comparator for Cameroon's cocoa value chain, given the similarities in cocoa production systems and the proximity of the two countries. The persistence of cash despite the availability of digital alternatives suggests significant barriers to mobile money adoption in cocoa value chains, including institutional factors, trust issues, and agent liquidity constraints.

The Ghanaian evidence on cash persistence in cocoa value chains highlights the gap between potential and actual digital finance adoption. The estimated annual losses from cash-based transactions USD 21.5 million are substantial and suggest significant economic inefficiency. The fact that over 90% of farmer-level transactions remain cash-based despite digital alternatives indicates that adoption barriers are substantial and multifaceted. These findings informed the current study's focus on identifying barriers to mobile money adoption in Cameroon's cocoa and maize value chains.

The World Bank (2026) documented that digital platforms have boosted farmer productivity and market access across West Africa, with the Agristore digital marketplace in Côte d'Ivoire recording over 36,000 agricultural sales listings. Additionally, Cameroon's electronic voucher system benefited nearly 4,000 producers with seed and fertilizer subsidies. These examples demonstrate that digital finance can have concrete impacts on agricultural productivity and market participation when implemented appropriately.

The World Bank documentation of digital platform impacts in West Africa provides macro-level validation of the potential benefits of digital finance for agriculture. The Côte d'Ivoire example of Agristore

a digital marketplace with 36,000 sales listings demonstrates that digital platforms can effectively connect producers with markets. The Cameroon electronic voucher system example shows that government programs can leverage digital payments to improve input access. However, these examples also suggest that successful digital finance interventions

3. Methodology

This study adopted a pragmatist research philosophy and an explanatory sequential mixed-methods design. A mixed-methods design was well suited to this study because it allowed quantitative estimation of adoption and performance effects to be followed by qualitative inquiry into the social, institutional, and governance conditions that shaped those effects (Abdulai, 2022; Parkhomchuk et al., 2025; Bontsa et al., 2023).

The study was conducted in two value-chain settings in Cameroon to capture variation in agricultural structure, technology exposure, and market organization. The cocoa value chain sites were located in Meme and Fako Divisions in the Southwest Region, while the maize value chain sites were situated in Mbam and Kim Divisions in the Centre Region. These sites were purposively selected for several reasons. First, they represent major production areas for their respective crops in Cameroon. Second, they offer variation in linguistic context (Anglophone in the Southwest, Francophone in the Centre) that may affect mobile money adoption. Third, they are characterized by different levels of value chain organization and institutional support.

The quantitative phase used a multi-stage stratified random sampling strategy. The target population was estimated at approximately 25,000 cocoa agripreneurs and 30,000 maize agripreneurs. Using Yamane's formula with a 95% confidence level and 5% margin of error, the minimum sample size was 394 respondents per value chain. To accommodate non-response, the final target sample was 500 cocoa agripreneurs and 500 maize agripreneurs, yielding a total quantitative sample of 1,000 respondents. The achieved sample was 912 agripreneurs (478 cocoa, 434 maize) after accounting for non-response and data quality issues.

For the qualitative phase, purposive sampling was used to select 40 agripreneurs from the quantitative sample, with 20 participants drawn from each value chain. In addition, 20 key informant interviews were conducted with mobile money agents, cooperative

leaders, agricultural extension officers, and telecom representatives.

Quantitative data were collected using a structured questionnaire that was pre-tested with 50 agripreneurs before field administration. The questionnaire captured information on: (1) demographic and socioeconomic characteristics (age, gender, education, household size, land size); (2) mobile money adoption and usage patterns (ownership, frequency, types of transactions); (3) agripreneur performance indicators (profits, market access, input expenditure, savings); (4) institutional factors (cooperative membership, extension access, distance to nearest mobile money agent); and (5) barriers and facilitators of mobile money adoption.

Qualitative data were collected using semi-structured interview guides tailored to agripreneurs and key informants. These guides explored perceptions of digital financial tools, adoption pathways, operational constraints, benefits, trust, and the institutional factors that supported or hindered use.

The quantitative survey was administered over the first three months of the fieldwork period by trained enumerators using tablet-based Open Data Kit software. Enumerators were trained in the objectives of the study, questionnaire administration, ethical considerations, and data quality control procedures. The qualitative phase followed in months four and five. During this stage, in-depth interviews lasting approximately 60 to 90 minutes were conducted, audio-recorded with consent, and transcribed verbatim for analysis.

Based on the theoretical frameworks and empirical literature reviewed, several *a priori* expectations were formulated.

For Objective 1 (Adoption Patterns): It was expected that mobile money adoption rates would be higher among cocoa agripreneurs compared to maize agripreneurs. This expectation was based on the more organized nature of export value chains, the larger transaction sizes in cocoa marketing, and the institutional support available through cocoa cooperatives and certification schemes. It was also expected that cooperative membership, education level, and proximity to mobile money agents would be significant positive predictors of adoption, consistent with findings from Ghana (Waldron et al., 2026) and Uganda (Bongomin et al., 2025).

For Objective 2 (Performance Effects): It was expected that mobile money adoption would be positively associated with agripreneur performance indicators. Specifically, it was expected that adopters would demonstrate higher profits, greater market access (selling to more buyers), higher input expenditure, and greater savings capacity compared to non-adopters. The magnitude of expected effects was based on World Bank (2026) documentation of digital platform impacts in West Africa, which suggested profit differentials of 12-25%.

For Objective 3 (Value Chain Differences): It was expected that the mobile money-performance relationship would be stronger for cocoa than for maize. This expectation was based on three mechanisms: (1) institutional support in the cocoa value chain including structured interventions similar to those documented in Côte d'Ivoire (World Bank, 2026); (2) transaction frequency and value, with cocoa agripreneurs receiving larger lump-sum payments where transaction cost reductions are more valuable; and (3) value chain formalization, with the cocoa export chain having more formal price discovery and quality standards.

For Objective 4 (Barriers and Facilitators): It was expected that adoption barriers would include insufficient agent liquidity (consistent with BEAC, 2025 findings on agent network constraints), lack of trust (consistent with Ambler et al., 2025 findings on fraud concerns), network unreliability (consistent with Ndip & Kemeni Kambiet, 2026 findings on rural infrastructure challenges), digital illiteracy, and transaction fees. It was expected that facilitators would include agent proximity and relationship quality, training programs (such as MTN's digital literacy initiatives), peer effects, and incentive structures.

Methods of Data Analysis

Quantitative Data Analysis

Quantitative data were analyzed using Stata 18 and SPSS 27. The analysis proceeded in several stages.

Descriptive Statistics and Bivariate Comparisons:

The first stage involved generating descriptive statistics (means, percentages, standard deviations) to characterize the sample and summarize adoption patterns. Bivariate comparisons between adopters and non-adopters, and between cocoa and maize agripreneurs, were conducted using t-tests for continuous variables and chi-square tests for categorical variables.

Multivariate Estimation: The second stage involved multivariate estimation using Ordinary Least Squares (OLS) regression for continuous outcome variables and logistic regression for binary outcome variables. The OLS specification estimated the relationship between mobile money adoption and agripreneur performance, while controlling for value-chain position and relevant covariates. The regression model took the form:

$$Y_i = \beta_0 + \beta_1 MM_i + \beta_2 VC_i + \beta_3 (MM_i \times VC_i) + \beta_4 X_i + \varepsilon_i$$

Where:

- Y_i represents the performance outcome for agripreneur i
- MM_i is a dummy variable for mobile money adoption
- VC_i is a dummy variable for value chain (cocoa = 1)
- $(MM_i \times VC_i)$ is the interaction term
- X_i is a vector of control variables (age, gender, education, cooperative membership, land size, distance to agent)
- ε_i is the error term

For binary outcomes (savings capacity), logistic regression was used with the same specification.

Propensity Score Matching: The third stage involved Propensity Score Matching (PSM) to address selection bias. Mobile money adoption is not random; adopters and non-adopters may differ systematically in ways that affect both adoption and outcomes. PSM addresses this by matching each adopter with a non-adopter with similar observable characteristics (propensity score), allowing estimation of the Average Treatment Effect on the Treated (ATT). The PSM analysis used nearest-neighbor matching with caliper, kernel matching, and radius matching as robustness checks. The propensity score was estimated using a logistic regression with covariates including age, gender, education, cooperative membership, distance to agent, land size, and value chain.

The justification for using PSM is threefold. First, PSM addresses selection bias by creating comparable treatment and control groups, improving the credibility of causal inferences. Second, PSM is appropriate when assignment to treatment is not

random but depends on observable characteristics, as is likely the case with mobile money adoption. Third, PSM has been widely used in similar studies (Ky, 2025; Waldron et al., 2026) and allows for comparability of findings.

Interaction Term Analysis: The fourth stage involved testing the interaction term between mobile money adoption and value chain to examine whether the mobile money-performance relationship differed between cocoa and maize. A statistically significant interaction term would indicate that the effect of mobile money on performance is moderated by value chain characteristics, supporting the hypothesis that value chain structure affects digital finance impacts.

Qualitative Data Analysis

The qualitative data were analyzed in NVivo 14 using thematic analysis. The analysis followed the six-phase approach proposed by Braun and Clarke (2006): (1) familiarization with the data through reading and re-reading transcripts; (2) generating initial codes through systematic coding of relevant text segments; (3) searching for themes by grouping codes into broader patterns; (4) reviewing themes to ensure coherence and distinctiveness; (5) defining and naming themes; and (6) producing the report with illustrative quotes.

Coding focused on recurring patterns related to adoption, usage, constraints, perceived value, and institutional context. This is consistent with the broader literature showing that digital agriculture outcomes are shaped not only by individual decisions but also by organizational and governance arrangements (Abdulai, 2022; Parkhomchuk et al., 2025).

Integration of Quantitative and Qualitative Findings

Findings from the two phases were integrated using a weaving approach. This allowed quantitative results and qualitative insights to be presented in a connected narrative, thereby showing where the two strands converged, diverged, or complemented one another. Such integration is important in this study because digital technology use in smallholder and agribusiness settings is shaped by both measurable determinants and context-specific social processes (Abdulai et al., 2022; Addison et al., 2024; Bontsa et al., 2023).

4. Results and Discussion

4.1 Result

Table 1: Sample Characteristics by Value Chain

Characteristic	Cocoa (n=478)	Maize (n=434)	Total (N=912)
Age (mean years)	47.3	44.8	46.2
Female (%)	28.7	34.1	31.2
No formal education (%)	23.4	18.9	21.3
Primary education (%)	41.8	44.7	43.2
Secondary+ education (%)	34.8	36.4	35.5
Cooperative membership (%)	67.4	42.6	55.7

Source: Author's survey, 2026

The achieved sample of 912 agripreneurs comprised 478 cocoa producers (52.4%) and 434 maize producers (47.6%). The mean age of respondents was 46.2 years, with cocoa agripreneurs slightly older (47.3 years) than maize agripreneurs (44.8 years). Female representation was 31.2% overall, slightly higher among maize (34.1%) than cocoa (28.7%).

Educational attainment was generally low, with 21.3% having no formal education, 43.2% having primary education, and only 35.5% having secondary education or higher. Cooperative membership was substantially higher among cocoa agripreneurs (67.4%) than maize agripreneurs (42.6%).

Adoption Rates

Table 2: Mobile Money Adoption Rates by Value Chain and Demographic Characteristics

Characteristic	Cocoa (%)	Maize (%)	Overall (%)	Chi-square	p-value
Overall adoption	44.2	31.6	38.3	15.67	<0.001
By Gender					
Male	48.3	35.2	41.8	8.23	0.004
Female	35.2	24.8	30.0	6.12	0.013
By Education					
No formal	28.6	18.5	23.6	12.45	<0.001
Primary	42.3	30.8	36.6	8.76	0.003
Secondary+	58.7	44.2	51.5	10.34	0.001
By Cooperative Membership					
Member	52.8	42.8	48.7	9.45	0.002
Non-member	25.6	20.4	23.3	7.23	0.007

Source: Author's survey, 2026

Overall mobile money adoption among agripreneurs was 38.3%. Adoption was significantly higher among cocoa agripreneurs (44.2%) compared to maize agripreneurs (31.6%) ($\chi^2=15.67$, $p<0.001$). These rates reflect Cameroon's position as Central Africa's leader

in mobile money accounts while acknowledging that rural adoption lags urban areas.

Gender differences were significant in both value chains. Male agripreneurs had higher adoption rates (41.8%) than female agripreneurs (30.0%). This gender gap was more pronounced in cocoa (48.3% vs. 35.2%) than in maize (35.2% vs. 24.8%). Education

was strongly associated with adoption, with secondary-educated agripreneurs showing adoption rates of 51.5% compared to 23.6% among those with no formal education. Cooperative membership

consistently predicted adoption, with members showing nearly double the adoption rates of non-members (48.7% vs. 23.3%).

Table 3: Mobile Money Usage Patterns Among Adopters by Value Chain

Usage Type	Cocoa (n=211)	Maize (n=137)	Overall (n=348)	Chi-square	p-value
Receiving payments from buyers	76.2	38.4	58.9	34.56	<0.001
Sending money to family	65.8	70.1	67.4	0.89	0.345
Storing savings	49.7	35.2	43.1	8.45	0.004
Paying for inputs	32.5	26.8	30.2	1.23	0.267

Source: Author's survey, 2026

Among adopters, usage patterns differed significantly between value chains. Receiving payments from buyers was the most common use among cocoa agripreneurs (76.2%), significantly higher than maize agripreneurs (38.4%) ($\chi^2=34.56$, $p<0.001$). This difference reflects the more organized marketing arrangements in the cocoa value chain, where buyers are more likely to use digital payments. Sending money to family was common in both value chains (cocoa 65.8%, maize 70.1%), indicating the social remittance function of mobile money. Storing savings was more common among cocoa adopters (49.7%)

than maize adopters (35.2%), consistent with the larger lump-sum payments received in cocoa marketing. Paying for inputs showed similar rates across value chains (32.5% vs. 26.8%, $p=0.267$), suggesting that input purchasing patterns are similar.

4.2.3 Platform Preferences

Orange Money and MTN Mobile Money dominated the market, consistent with The Fintech Times (2026) documentation. Small minority usage of Smobilpay and Express Exchange was noted but did not reach statistical significance.

4.2.4 Determinants of Mobile Money Adoption

Table 4: Logistic Regression Results for Mobile Money Adoption Determinants

Variable	Coefficient	Odds Ratio	Std. Error	z-value	p-value
Cooperative membership	0.849***	2.337	0.178	4.77	<0.001
Education	0.626***	1.871	0.145	4.32	<0.001
Distance to agent (km)	-0.401**	0.670	0.165	-2.43	0.015
Value chain (cocoa)	0.542***	1.719	0.152	3.57	<0.001
Age	0.012	1.012	0.008	1.50	0.134
Gender (male)	0.523**	1.687	0.189	2.77	0.006
Land size	0.023	1.023	0.018	1.28	0.201

*Note: *** $p<0.001$, ** $p<0.01$. Model $\chi^2=89.45$, $p<0.001$; Pseudo $R^2=0.187$; $n=912$.

Source: Author's analysis, 2026

The logistic regression results showed that cooperative membership (OR=2.337, $p<0.001$), education (OR=1.871, $p<0.001$), value chain (cocoa, OR=1.719, $p<0.001$), and male gender (OR=1.687, $p=0.006$) were positive predictors of adoption, while distance to

nearest agent (OR=0.670 per km, $p=0.015$) was a negative predictor. Age and land size were not statistically significant. These findings are consistent with our a priori expectations and with findings from Ghana (Waldron et al., 2026).

Profitability

Table 5: Profitability by Mobile Money Adoption Status and Value Chain

Outcome	Cocoa Adopters (n=211)	Cocoa Non-Adopters (n=267)	Maize Adopters (n=137)	Maize Non-Adopters (n=297)
Mean annual profit (CFA)	1,285,000	1,028,000	845,000	735,000

% Difference		+25.0%		+15.0%
Comparison	t=4.56, p<0.001		t=2.98, p=0.003	

Source: Author's survey, 2024

Mobile money adopters demonstrated significantly higher profits than non-adopters in both value chains. Cocoa adopters had mean annual profits of 1,285,000 CFA compared to 1,028,000 CFA for non-adopters, representing a 25% differential (t=4.56, p<0.001).

Maize adopters had mean annual profits of 845,000 CFA compared to 735,000 CFA for non-adopters, representing a 15% differential (t=2.98, p=0.003). These profit differentials were economically significant and consistent with our a priori expectations based on World Bank (2026) documentation of digital platform impacts in West Africa.

4.3.2 Market Access

Table 6: Market Access by Mobile Money Adoption Status and Value Chain

Outcome	Cocoa Adopters (n=211)	Cocoa Non-Adopters (n=267)	Maize Adopters (n=137)	Maize Non-Adopters (n=297)
Mean number of buyers	2.8	1.9	2.5	1.6
% Difference		+47.4%		+56.3%
Comparison	t=4.12, p<0.001		t=3.87, p<0.001	

Source: Author's survey, 2026

Mobile money adopters reported selling to significantly more buyers than non-adopters. Cocoa adopters reported mean of 2.8 buyers compared to 1.9 for non-adopters, a 47% difference (t=4.12, p<0.001). Maize adopters reported mean of 2.5 buyers compared

to 1.6 for non-adopters, a 56% difference (t=3.87, p<0.001). This aligns with evidence from Côte d'Ivoire where the Agristore digital marketplace recorded over 36,000 agricultural sales listings (World Bank, 2026). The effect was proportionally larger for maize, perhaps reflecting the greater fragmentation of maize markets where digital payments enable access to more distant buyers.

4.3.3 Input Utilization

Table 7: Input Expenditure by Mobile Money Adoption Status and Value Chain

Outcome	Cocoa Adopters (n=211)	Cocoa Non-Adopters (n=267)	Maize Adopters (n=137)	Maize Non-Adopters (n=297)
Mean annual input expenditure (CFA)	147,500	125,000	132,000	89,500
% Difference		+18.0%		+47.5%
Comparison	t=2.34, p=0.019		t=4.67, p<0.001	

Source: Author's survey, 2026

Mobile money adopters spent significantly more on agricultural inputs (fertilizer, improved seeds, pesticides) than non-adopters. Cocoa adopters spent 147,500 CFA compared to 125,000 CFA for non-adopters, an 18% difference (t=2.34, p=0.019). Maize adopters spent 132,000 CFA compared to 89,500 CFA

for non-adopters, a 47.5% difference (t=4.67, p<0.001). The larger effect for maize may reflect the greater role of purchased inputs in maize production and the alignment with Cameroon's electronic voucher system that targeted seed and fertilizer access (World Bank, 2026).

4.3.4 Savings Capacity

Table 8: Formal Savings Capacity by Mobile Money Adoption Status and Value Chain

Outcome	Cocoa Adopters (n=211)	Cocoa Non-Adopters (n=267)	Maize Adopters (n=137)	Maize Non-Adopters (n=297)
Reporting formal savings (%)	52.3	32.5	38.7	21.3
Odds Ratio		1.94 (OR)		1.82 (OR)

Comparison	$\chi^2=8.34, p=0.004$		$\chi^2=6.78, p=0.009$	
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Source: Author's survey, 2026

Mobile money adopters were significantly more likely to report having formal savings compared to non-adopters. Among cocoa agripreneurs, 52.3% of adopters had formal savings compared to 32.5% of non-adopters (OR=1.94, $p=0.004$). Among maize

agripreneurs, 38.7% of adopters had formal savings compared to 21.3% of non-adopters (OR=1.82, $p=0.009$). The mobile wallet's function as a savings tool is particularly important in rural areas where formal banking services are limited.

4.3.5 Propensity Score Matching Results

Table 9: Propensity Score Matching Results for Profit Effects

Matching Method	Cocoa ATT	Cocoa t-value	Maize ATT	Maize t-value
Nearest neighbor	22.8%	4.32***	14.2%	2.89**
Kernel	24.1%	4.56***	15.3%	3.12**
Radius	23.5%	4.41***	14.8%	2.95**

*Note: *** $p<0.001$, ** $p<0.01$

Source: Author's analysis, 2026

The PSM analysis confirmed the positive mobile money effect for both value chains. The Average Treatment Effect on the Treated (ATT) ranged from 22.8% to 24.1% for cocoa and from 14.2% to 15.3% for maize, depending on the matching method used.

All estimates were statistically significant at $p<0.01$ or better. These PSM results provide confidence that the observed positive relationship between mobile money adoption and profitability is not simply due to selection bias.

Table 10: Interaction Term Analysis for Mobile Money Performance Effects

Outcome Variable	Interaction Coefficient	Standard Error	t-value	p-value
Profit	0.124**	0.051	2.43	0.015
Market access	0.089	0.067	1.33	0.184
Input expenditure	-0.098*	0.053	-1.85	0.064
Savings capacity	0.112	0.078	1.44	0.150

*Note: ** $p<0.05$, * $p<0.10$

Source: Author's analysis, 2026

The interaction term between mobile money adoption and value chain was statistically significant for profit ($\beta=0.124$, $p=0.015$), indicating that the mobile money effect on profitability was stronger for cocoa than for maize. The interaction term for input expenditure was marginally significant in the opposite direction ($\beta=-0.098$, $p=0.064$), suggesting that while profit effects were larger for cocoa, input utilization effects were larger for maize.

These differential effects can be explained by three mechanisms identified in the qualitative data and consistent with our a priori expectations:

The cocoa value chain includes structured interventions including certification schemes, price controls, and cooperative marketing arrangements that provide institutional support for digital payment adoption. As one cocoa cooperative leader explained:

"When the buyers come, they must pay through mobile money. It is the policy of the cooperative. This makes the farmers trust the system because they see their

money immediately." (Key informant, cocoa cooperative leader, Meme Division)

Cocoa agripreneurs receive larger lump-sum payments that make the convenience and security of mobile money more valuable. Conversely, maize transactions are smaller and more frequent:

"With maize, you sell small quantities, maybe 10,000 CFA at a time. You don't need mobile money for that. But with cocoa, you may receive 200,000 CFA at once. You don't want to carry that cash." (Agripreneur, maize producer, Mbam Division)

The cocoa export chain has more formal price discovery and quality standards, creating institutional support for digital payments:

"Cocoa has a system. The price is announced by the government. The cooperatives monitor quality. Everything is more organized. With maize, it is whatever the buyer wants to pay that day." (Key informant, agricultural extension officer, Centre Region)

4.5.1 Barriers to Mobile Money Adoption

Table 11: Perceived Barriers to Mobile Money Adoption Among Non-Adopters

Barrier	Cocoa Non-Adopters (n=267)	Maize Non-Adopters (n=297)	Overall (N=564)
Insufficient agent liquidity	62.8%	65.4%	64.2%
Lack of trust	57.8%	59.7%	58.8%
Network unreliability	49.8%	51.2%	50.5%
Digital illiteracy	46.2%	49.3%	47.8%
Transaction fees	36.5%	39.7%	38.2%

Source: Author's survey, 2026

The most commonly cited barrier was insufficient agent liquidity (64.2%), where agents lacked sufficient cash to allow withdrawals. This is significant given the CEMAC agent network's size (449,000 agents processing €44 billion) (BEAC, 2025), but rural agents face seasonal cash flow challenges. As one agripreneur explained:

"You go to the agent to withdraw money, but they say 'no cash.' What is the use of mobile money if you cannot get your money when you need it?" (Agripreneur, cocoa producer, Fako Division)

Lack of trust was the second most cited barrier (58.8%), reflecting concerns about fraud, system errors, and the safety of digital value. A mobile money agent elaborated:

"People are afraid. They have heard stories of money disappearing from phones. Or they try to send money and it does not arrive. These stories spread quickly in the village." (Key informant, mobile money agent, Meme Division)

Network unreliability (50.5%) and digital illiteracy (47.8%) were also significant barriers. Transaction fees (38.2%) were cited less frequently, suggesting that while fees are a concern, they are not the primary barrier.

4.5.2 Facilitators of Mobile Money Adoption

Facilitator 1: Agent Proximity and Relationship Quality

The expansion of the agent network (37% growth in 2023 according to BEAC, 2025) was identified as a key facilitator:

"When the agent came to our village, everything changed. Before, we had to travel to town to get cash. Now, the agent is here, and we can do everything." (Agripreneur, maize producer, Kim Division)

Facilitator 2: Training Programs

MTN's digital literacy initiatives and cooperative-based training were cited as important:

"The cooperative brought someone from Orange Money to teach us. After the training, many people registered. We saw that it was not difficult." (Agripreneur, cocoa producer, Meme Division)

Facilitator 3: Peer Effects and Social Learning

Social networks and peer influence facilitated adoption:

"When you see your neighbor using mobile money and benefiting from it, you want to try too. It creates confidence." (Agripreneur, maize producer, Mbam Division)

Facilitator 4: Incentive Structures

Incentives from buyers, cooperatives, and certification schemes motivated adoption:

"Now, certified cocoa buyers will only pay through mobile money. If you want to sell to them, you must have mobile money." (Agripreneur, cocoa producer, Fako Division)

4.2 Discussion

The finding that mobile money adoption was significantly higher among cocoa agripreneurs (44.2%) compared to maize agripreneurs (31.6%) is consistent with our a priori expectation and can be understood through the lens of Transaction Cost Economics. The cocoa export value chain, with its larger transaction sizes, formalized relationships, and institutional support, has higher baseline transaction costs that mobile money can reduce. As Ambler, de Brauw, and Bloem (2025) note, digital finance can improve efficiency in intermediary agrifood firms by reducing transaction costs. The cocoa value chain's

formalization creates conditions where transaction cost reductions through mobile money are more valuable.

This finding aligns with Ky's (2025) cross-country evidence that farmers are more likely to adopt mobile money accounts than non-farmers, though Ky's adoption rate (below 30%) was lower than the average rate found in this study (38.3%). The higher rate in this study may reflect Cameroon's position as Central Africa's fintech leader (The Fintech Times, 2026) or the specific focus on agricultural value chains.

The importance of cooperative membership (OR=2.337, $p<0.001$), education (OR=1.871, $p<0.001$), and distance to agent (OR=0.670 per km, $p=0.015$) as adoption determinants is consistent with our a priori expectations and with findings from Ghana (Waldron et al., 2026) and Uganda (Bongomin et al., 2025). Cooperative membership provides institutional support that reduces the transaction costs of adoption through collective learning and trust-building. Education enhances perceived usefulness and ease of use (consistent with TAM), while distance to agent increases the transaction costs of using mobile money, reducing adoption.

The gender gap in adoption (41.8% male vs. 30.0% female) is concerning and consistent with Ndip and Kemeni Kambiet's (2026) finding that mobile money negatively affects women's diet quality in Cameroon. This suggests that while mobile money can improve outcomes at the household level, it may have distributional effects that disadvantage women. The TAM framework suggests that women may perceive lower usefulness or ease of use for mobile money, possibly due to less access to information, education, and social networks that facilitate adoption.

The finding that value chain structure, cooperative membership, education, and distance to agent are key adoption determinants suggests that interventions to increase mobile money adoption should be value chain-specific. For the cocoa value chain, leveraging cooperative structures for mobile money promotion is likely effective. For the maize value chain, addressing the fragmentation of marketing arrangements and improving agent coverage are priorities. The gender gap requires targeted interventions including women-specific training programs and addressing trust concerns among female agripreneurs.

The finding that mobile money adoption is associated with 22-25% higher profits for cocoa and 12-15% higher profits for maize is consistent with our a priori

expectations and supports Transaction Cost Economics. Mobile money reduces transaction costs associated with cash handling, transportation to financial institutions, and the risks of carrying cash. These transaction cost reductions translate directly to increased profitability. The World Bank (2026) documentation of digital platform benefits across West Africa provides macro-level validation of these findings.

The positive relationship between mobile money and market access (47% more buyers for cocoa, 56% for maize) is consistent with transaction cost logic: mobile money reduces the costs of transacting with distant buyers, enabling agripreneurs to access more markets and potentially better prices. This aligns with evidence from Côte d'Ivoire where the Agristore digital marketplace recorded over 36,000 agricultural sales listings (World Bank, 2026). The finding that mobile money adoption is associated with significantly higher input expenditure (18% for cocoa, 47.5% for maize) supports the agricultural transformation theory proposition that access to financial services enables investment in productivity-enhancing inputs. Schultz (1964) argued that farmers are "efficient but poor," constrained by limited access to capital rather than lack of motivation. Mobile money facilitates input purchases by enabling digital payments to input suppliers and providing transaction histories that may support credit decisions.

The savings capacity finding (OR=1.94 for cocoa, OR=1.82 for maize) highlights the role of mobile money as a savings tool. The mobile wallet functions as a secure store of value, protecting savings from theft and providing a buffer against income seasonality. This aligns with Wahbi and Musshoff's (2024) finding that MFS have become critical savings tools in Sub-Saharan Africa.

The PSM results confirming the positive mobile money effect (ATT ranging from 22.8% to 24.1% for cocoa, 14.2% to 15.3% for maize) provide confidence that the observed associations are not solely due to selection bias. This is important because more educated, cooperative members, and otherwise more advantaged agripreneurs may be more likely to adopt mobile money and also have better outcomes. By matching adopters and non-adopters on observable characteristics, PSM helps isolate the effect of mobile money adoption.

The performance effects of mobile money are economically significant and justify policies to promote adoption. The magnitude of effects suggests

that mobile money is not just a convenience but a productivity-enhancing technology. However, the effect is not uniform across value chains, suggesting that differentiated interventions are needed. The input utilization effect for maize is proportionally larger than for cocoa, perhaps reflecting the greater role of purchased inputs in maize production and the alignment with government voucher programs. The savings effect suggests that mobile money can help address seasonality challenges common in agriculture.

The finding that the mobile money-profit relationship is stronger for cocoa than maize (interaction coefficient $\beta=0.124$, $p=0.015$) is consistent with our a priori expectation and supports the transaction cost economics prediction that transaction cost reductions are more valuable in value chains with higher baseline transaction costs. The cocoa export value chain, with its larger transaction sizes, formalized relationships, and institutional support, likely faces higher transaction costs, making the transaction cost reductions from mobile money more valuable.

The finding that input utilization effects are larger for maize (interaction coefficient $\beta=-0.098$, $p=0.064$) suggests important heterogeneity in how mobile money affects different performance dimensions. This may reflect the fact that maize production is more input-intensive (requiring fertilizer, improved seeds, pesticides) while cocoa production has relatively lower input intensity. The World Bank (2026) documentation of Cameroon's electronic voucher system targeting seed and fertilizer access aligns with this finding.

The qualitative mechanisms identified institutional support, transaction frequency and value, and value chain formalization provide nuanced understanding of the differential effects. The cocoa value chain's cooperative structure, price controls, and certification schemes create institutional support for digital payments that is absent in the fragmented maize value chain. Transaction size matters because the convenience and security benefits of mobile money are more valuable for larger transactions. Value chain formalization matters because formal institutions reduce information asymmetries and support trust in digital systems.

The moderation of mobile money effects by value chain characteristics has important policy implications. A one-size-fits-all approach to digital finance promotion in agriculture is unlikely to be effective. For the cocoa value chain, building on existing cooperative structures and formal marketing

arrangements is likely effective. For the maize value chain, addressing market fragmentation and improving institutional support for digital payments may be priorities. The finding that mobile money enhances input utilization more for maize is important given food security concerns and the potential to improve productivity in domestic food production.

The identification of insufficient agent liquidity as the most common barrier (64.2%) is consistent with our a priori expectation and with Transaction Cost Economics logic. If agents lack liquidity to facilitate cash-out transactions, the transaction costs of using mobile money increase, reducing adoption and use. The CEMAC agent network processed €44 billion in 2023 (BEAC, 2025), but rural agents face seasonal cash flow challenges during harvest periods when demand for cash-out transactions peaks. This suggests a need for agent liquidity facilities, particularly in rural areas.

The finding that lack of trust is a significant barrier (58.8%) aligns with Ambler et al.'s (2025) finding that potential users of digital technologies cite fears of scams and overcharging by agents. In Nigeria, an estimated 2.3 million users had experienced fraud by mobile money agents (Ambler et al., 2025). Trust is a critical determinant of technology adoption in TAM, and addressing trust concerns is essential for increasing adoption.

Network unreliability (50.5%) and digital illiteracy (47.8%) are consistent with Ndip and Kemeni Kambiet's (2026) observation that rural infrastructure challenges affect mobile money adoption. Transaction fees (38.2%) were less commonly cited, consistent with the finding that fees are not the primary barrier. This suggests that addressing liquidity, trust, network, and literacy barriers may be more important than fee reduction.

The identification of agent proximity and relationship quality as a facilitator is consistent with BEAC's (2025) observation that the agent network enables mobile money access. The non-exclusive agent model that enabled the CEMAC network's growth should be maintained and strengthened. Training programs (MTN's digital literacy initiatives) and peer effects support adoption through knowledge sharing and social learning. Incentive structures from buyers, cooperatives, and certification schemes create economic motivation for adoption.

Interventions to address mobile money barriers in rural agricultural settings should prioritize agent liquidity

(through credit or liquidity facilities), trust-building (through consumer protection and transparency), network reliability (through infrastructure investment), and digital literacy (through training programs). Fee structures may be less important than these other barriers, though transaction costs do matter. The facilitators identified—agent relationships, training programs, peer effects, and incentives provide pathways for increasing adoption and should be leveraged by policymakers and mobile money providers.

5. Conclusion and Recommendations

This study examined the relationship between mobile money adoption and agripreneur performance within Cameroon's cocoa and maize rural agricultural value chains. The research addressed a significant gap: the absence of comparative empirical evidence on how mobile money's effects differ across distinct agricultural value chains. By employing an explanatory sequential mixed-methods design and grounding the analysis in Transaction Cost Economics, this study contributes to understanding how value chain characteristics moderate digital finance impacts.

The study reached four main conclusions. First, mobile money adoption among Cameroonian agripreneurs, while higher in the cocoa value chain (44.2%) than in the maize value chain (31.6%), remains below potential. Cameroon's position as Central Africa's fintech leader (63% of mobile money accounts, 77% of transaction value) provides infrastructure, but agricultural adoption requires additional facilitation. Cooperative membership, education, and distance to agent are key determinants of adoption, highlighting the importance of institutional support, digital literacy, and agent coverage.

Second, mobile money adoption is positively associated with agripreneur performance across profitability, market access, input utilization, and savings capacity. The magnitude of these associations (12-25% profit differential, 47-56% greater market access, 18-47.5% higher input expenditure, 1.8-1.9 times greater odds of formal savings) is economically significant and consistent with evidence from other West African countries (World Bank, 2026). The PSM results confirm that these associations are not solely due to selection bias.

Third, the relationship between mobile money and performance is moderated by value chain

characteristics. The profit effect is stronger for cocoa than for maize, while the input utilization effect is stronger for maize than for cocoa. These differential effects are explained by institutional support, transaction frequency and value, and value chain formalization—mechanisms consistent with transaction cost economics. This finding has important implications for policy design, suggesting that a one-size-fits-all approach is inappropriate.

Fourth, adoption barriers including insufficient agent liquidity (64.2%), lack of trust (58.8%), network unreliability (50.5%), digital illiteracy (47.8%), and transaction fees (38.2%) remain significant. However, facilitators including agent relationships, training programs, peer effects, and incentive structures offer pathways for increasing adoption. The identification of agent liquidity as a primary barrier suggests that addressing this constraint should be a priority.

To address the multifaceted barriers to mobile money adoption and optimize its performance-enhancing effects across Cameroon's agricultural value chains, policymakers should implement a coordinated set of interventions. First, establishing rural agent liquidity facilities with seasonal credit lines is essential to address the critical constraint of insufficient agent liquidity during harvest periods when demand for cash-out transactions peaks. Second, integrating digital financial literacy into agricultural extension programs would leverage existing extension infrastructure to build the digital capabilities of agripreneurs. Third, developing value chain-specific digital finance strategies that recognize the distinct needs of export crops like cocoa versus domestic food crops like maize would ensure that interventions are appropriately tailored. Fourth, implementing gender-sensitive digital finance policies is necessary to address the significant adoption gap between male and female agripreneurs and mitigate potential negative distributional effects on women's welfare. Fifth, investing in rural digital infrastructure, particularly expanding mobile network coverage in agricultural areas, would address the persistent challenge of network unreliability that undermines trust and usability of mobile money services.

Mobile money providers should complement these policy efforts by developing value chain-specific products with differentiated features for cocoa and maize value chains, investing in rural agent selection, training, and liquidity support to improve service quality and reliability, and simplifying user interfaces through USSD, voice-based services, and local language support to overcome digital literacy barriers.

Additionally, providers should implement comprehensive trust-building measures including consumer protection mechanisms, transparent fee structures, and fraud prevention protocols, while strategically partnering with agricultural cooperatives and extension services for joint training programs. For agripreneurs and their cooperatives, it is recommended that cooperatives negotiate mobile money training as a membership benefit and facilitate peer learning networks, while agripreneurs should leverage mobile money transaction histories to build credit records and access formal financial services, and consider mobile wallets as secure savings tools to protect against theft and address seasonal income fluctuations. Cooperatives should also proactively work with mobile money providers to develop customized solutions that address the specific needs of their members, thereby creating a collaborative ecosystem that maximizes the developmental potential of digital financial services in rural agricultural communities.

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