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Regional Analysis of the Currency Redesign Policy on Nigeria's Socioeconomic, Business and Financial Landscape

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Abstract

This study investigates the heterogeneous regional effect of Nigeria's 2022 currency redesign policy, given its uneven socioeconomic effect in emerging economies, focus on aggregate national impacts, and the neglect of critical regional disparities in financial infrastructure and informal sector reliance in prior studies. This study addresses this gap by assessing the regional effects of the policy on Nigeria's socioeconomic welfare (income, consumption, employment), financial landscapes (inclusion, cashless adoption), and the mediating roles of financial infrastructure, digital readiness, education, and informality. Data sourced from six representative states across Nigeria's geopolitical zones from 2021–2024 were analyzed using Difference-in-Differences and Moderated Mediation regression models to isolate causal policy effects and explain regional variation. Results revealed that the policy disproportionately reduced household welfare largely in cash-dependent regions by 28.7%. Conversely, it accelerated financial inclusion and digital adoption, particularly in digitally ready southern states. Financial infrastructure, education, and digital readiness positively mediated welfare outcomes, whereas high informality amplified negative effects. Macroeconomic indicators, such as fiscal transparency and regional GDP, contributed modestly to household welfare, whereas inflation exerted significant negative effects, revealing the limited transmission of macro gains to micro-level outcomes. The study revealed that while the policy partially achieved its objectives of promoting financial inclusion and monetary stability, regional heterogeneity critically shaped its effectiveness. The study recommends strengthening the financial infrastructure, promoting digital readiness, supporting informal sectors, and enhancing policy communication to ensure inclusive and equitable outcomes.

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Keywords: Currency redesign, household welfare, financial inclusion, digital finance, regional analysis, Nigeria, monetary policy

1. Introduction

In the 21st-century economic, business and financial landscape the currency redesign has increasingly emerged as a strategic monetary policy instrument adopted by central banks globally to strengthen financial integrity, reduce illicit financial flows and enhance the efficiency of payment systems (Olujobi, 2022; Umoh et al, 2025; Samuel et al, 2018). In developed economies such as the United States, Canada, and the Eurozone, the currency redesign initiatives are technologically driven and robustly coordinated, with minimal disruption due to their robust financial infrastructure, high digital readiness, and inclusive financial systems (OECD, 2022; Udo et al, 2025; Samuel et al, 2023).

In contrast, redesign efforts in emerging economies such as India, Pakistan, and Zimbabwe, led to volatile socioeconomic outcomes, due to structural and institutional laxity, tiggered by institutional capacity, widespread informality, and heavy dependence on cash-based transactions. India's 2016 demonetization, although intended to tackle corruption and counterfeit cash, led to severe liquidity shortages, business closures, and welfare losses, particularly among low-income and informal-sector workers (Rao & Patnaik, 2022). These experiences reveal that policy effectiveness is context-specific and mediated by a nation's institutional quality, financial infrastructure, and the size of its informal economy.

In a bid to address economic, business and financial challenges such as counterfeiting, illicit financial flows, financial exclusion, and weak monetary policy confidence, hampering the growth and confidence of investors in the sub-Saharan African economies, countries such as Kenya and Ghana adopted the currency redesign to strengthen monetary credibility and financial integrity despite mixed results. Kenya's demonetization of its 1,000-shilling notes in 2019 and Ghana redesigning of its cedi in 2019, revealed short-term successes in reducing counterfeit circulation and improving financial inclusion (Central Bank of Kenya, 2019; Bank of Ghana, 2019), while the broader welfare effects varied due to differences in financial literacy, infrastructure, and policy coordination.

Within this continental context, Nigeria's 2022 Currency Redesign Policy represents one of the most ambitious monetary reforms on the continent. Announced by the Central Bank of Nigeria (CBN) in October 2022, the policy sought to replace the ₦200, ₦500, and ₦1,000 notes to curb illicit financial activities, reduce currency outside the banking system, accelerate the transition toward a cashless economy and limit vote buying ahead of the 2023 general elections, (CBN, 2022; World Bank, 2023). At the time of its introduction, over ₦3.23 trillion, accounting for more than 85% of the total currency in circulation in Nigeria, was held outside the banking system, thus undermining monetary policy transmission and reducing fiscal transparency (CBN, 2023).

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Despite the policy objectives, the implementation in early 2023 was marred by cash shortages due to logistical constraints, weak distribution channels, and inadequate communication. These disruptions led to declines in informal-sector output, household liquidity, increased transaction costs, and heightened psychosocial distress (World Bank, 2023; Umoh et al., 2025; Afolayan & Adegbite 2023; Udo et al. 2025; Samuel et al. 2023). Crucially, the magnitude of these effects diverged widely across Nigeria's geopolitical zones.

Regions with weak financial infrastructure, low digital readiness, and deeply entrenched informal economies such as Northern Nigeria experienced acute socioeconomic hardship, while digitally connected southern states adapted more quickly through electronic payment channels (Bello & Hassan, 2024; BMC Public Health, 2024). This regional asymmetry reflects Nigeria's deep structural inequalities in terms of financial access, digital infrastructure, and economic diversification.

Despite the policy objectives, the benefits remain debatable, as such on the one hand, the redesign strengthened currency security features, improved the tracking of illicit financial flows, and encouraged the expansion of digital payment channels (Ibrahim & Ijeoma, 2024; Umoh et al, 2025a,b). On the other hand, unintended socioeconomic consequences, particularly in regions with weak financial infrastructure, undermined its effectiveness and public acceptability. Therefore, these outcomes mirror the broader debate in emerging economies, where currency reforms achieve macroeconomic objectives at the expense of economic stability and welfare (Gupta & Saini, 2022; Umoh et al 2025a,b). The Nigerian case, therefore, presents a paradox: a policy designed to modernize the economy and enhance monetary stability simultaneously deepens social hardship and economic inequality across regions.

Also, extant studies treated Nigeria as a homogeneous economic space, despite clear evidence that the policy produced unequal socioeconomic and financial outcomes across regions with different structural characteristics. What remains insufficiently understood is how regional disparities in financial infrastructure, digital readiness, educational attainment, and informal-sector dominance mediate the policy's impact on household welfare and financial behaviour. Without addressing this heterogeneity, the overall effectiveness and equity of the policy cannot be significantly assessed. Addressing this problem is critical because regional disparities shape monetary policy transmission channels, household liquidity constraints, and the capacity to substitute cash with digital payment systems in Nigeria.

In contexts where informal-sector reliance and financial exclusion are high, uniform national reforms risk amplifying vulnerability, inequality, and distrust in institutions. Understanding the spatial dynamics of Nigeria's redesign therefore offers essential insights for designing inclusive and resilient monetary policies in developing economies. Regions with robust financial and digital infrastructure recorded relative resilience and a quicker shift toward cashless transactions, whereas those with weak institutional and technological capacities suffered greater economic dislocation.

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Extant literature reveals that financial infrastructure enhances access to formal financial services and mitigates liquidity shocks during monetary transitions (Beck et al., 2020; Udo et al 2025). Digital readiness and education influence the adoption and effective use of electronic payment systems (Evans & Pirchio, 2015), while informality heightens exposure to cash shortages due to dependence on physical currency and limited digital alternatives (La Porta & Shleifer, 2014). These mechanisms reveal Nigeria's structural asymmetries that creates differentiated pathways through which the redesign policy translates into welfare outcomes necessitating a regionally disaggregated analytical approach.

Extant studies on Nigeria's currency redesign have focused on national-level inflation, digital payment trends, or sector-specific outcomes (Umoh et al 205a, b; Afolayan & Adegbite, 2023; Ibrahim & Ijeoma, 2024). However, these studies ignore regional heterogeneity effect and do not integrate both socioeconomic and financial dimensions within a unified empirical framework. The assessing the nexus rarely employ causal inference techniques that explain why effects differ across regions. This study addresses these limitations by examining the regional effects of the policy using data from six states representing Nigeria's geopolitical diversity. It also identifies the mediating role of structural factors, such as infrastructure, education, and informality in shaping regional outcomes.

By integrating macroeconomic and micro-level analyses, this study contributes by providing context-specific empirical evidence on how the redesign policy influences household welfare and financial behavior in a developing economy characterized by high informality and financial exclusion. This expands the literature on monetary policy effectiveness by linking national reforms to regional socioeconomic realities. The results of this study provide relevant insights to guide future monetary reforms to ensure that they are equitable, inclusive, and aligned with the welfare of vulnerable populations.

The broad objective of this study is to assess the regional effect of Nigeria's 2022 Currency Redesign Policy on socioeconomic welfare and financial behaviours. This study focuses on capturing the full spectrum of Nigeria's economic and financial diversity, from digitalized urban economies to informal and agrarian settings. The study capture Lagos State (South West) Nigeria's financial and technological hub, Anambra State (South East) center of trade and small-scale entrepreneurship, Akwa Ibom State (South South) a mixed urban–rural economy with emerging digital inclusion, Kwara State (North Central) a transitional state that balances formal and informal activities, Kano State (North West) the commercial nucleus of northern Nigeria with a strong informal economy, and Borno State (North East) conflict-affected region with limited financial access and infrastructure. This allows for a comparative regional analysis that reveals how structural, infrastructural, and institutional disparities mediate the socioeconomic and financial outcomes of the redesign policy.

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By disaggregating national-level effects into regional realities, this study contributes to a more inclusive monetary policy design and offers actionable insights into future financial reforms in Nigeria and other emerging economies.

2. **Literature Review**

Currency redesign is a monetary policy intervention deployed by central banks to modernize the payment system, combat counterfeiting, limit illicit financial flows and improve monetary-policy transmission. The theoretical underpinnings of these policies are grounded in Monetary Policy Transmission Theory, which posits that altering the physical money supply affects liquidity conditions, price stability, and economic activity (Blanchard, 2022; Inim et al., 2020). Complementarily, institutional theory emphasizes that policy outcomes depend on institutional capacity, regulatory coordination, and infrastructural readiness (North, 1990; Umoh et al., 2025). Global evidence reveals a context-dependent dichotomy:

In developed economies with robust digital and institutional frameworks, policy implementation is seamless and technically focused on security upgrades with minimal socioeconomic disruption (ECB, 2021). In emerging economies these policies tend to be disruptive as its deployed to pursue structural reforms or curb illicit financial flows, and typically generates significant short-term socioeconomic stress (Chandrasekhar & Ghosh, 2021; Ghatak, 2023). This contrast underscores that policy effects are not inherent to the instrument but conditioned by local structural and institutional characteristics. Experiences in India, Pakistan, and Zimbabwe show that redesign in cash-dependent societies often triggers: acute liquidity shortages, output contraction in informal sectors, unemployment spikes, and erosion of public trust in institutions. India's 2016 demonetization is the leading case, achieving modest gains in tax compliance but causing severe welfare losses among low-income and rural populations (Chandrasekhar & Ghosh, 2021). Similarly, Zimbabwe's reforms generated financial dislocation due to institutional fragility and reliance on cash-based livelihoods.

Nigeria's 2022-naira redesign policy, targeting the ₦200, ₦500, and ₦1,000 notes, was launched with similar ambitious goals: reducing currency outside the banking system, curbing inflation, and accelerating the transition to a cashless economy (CBN, 2022). Extant studies have revealed that this policy triggered a profound national crisis. Studies by Oyedele (2023), revealed that cash crunch paralyzed collapsed informal-sector transactions that employed the 85% of Nigerians labour force, Umoh et al. (2025a,b), reported a sharp decline in Small and Medium-sized Enterprises (SME) sales and household consumption, Egwakhe et al. (2024) reported rising operating costs, Osita et al., (2023) observed consumption contraction and liquidity-constrained in households while heightened anxiety and loss of public trust in banking institutions was reported by (Samuel et al., 2023). Although digital transaction volumes increased (NIBSS, 2023), scholars argue that the benefits were uneven due to infrastructural and literacy gaps (Ejiogu et al., 2022; Udo et al., 2025). This created a paradoxical situation in which the policy's push for financial modernization was undermined by the nation's infrastructural deficits, eroding trust in financial institutions and exacerbating financial anxiety.

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However, a critical gap pervades studies of Nigeria's 2022 policy. Studies by Afolayan and Adegbite (2023), Umoh et al. (2025a,b), and Ibrahim and Ijeoma (2024) treat Nigeria as a monolithic entity, presenting aggregate national-level impacts that mask critical subnational variations. This national bias is a significant shortcoming given Nigeria's regional inequalities in banking density, digital infrastructure, and economic and business structures (NBS, 2023). The North-South and urban-rural divides imply that a farmer in Katsina, reliant on cash for subsistence, experienced a liquidity squeeze fundamentally differently from a petty trader in Lagos with access to digital alternatives. Bello and Hassan (2024) acknowledge these disparities, noting that the northwest and northeast suffered more severe disruptions than the southwest. However, a systematic, regionally disaggregated analysis that integrates both socioeconomic welfare indicators (income, consumption, poverty) and financial behavior metrics (cash reliance and digital adoption) across the six geopolitical zones remains absent.

Therefore, this study was justified and differentiated by its explicit focus on this regional dimension. It departs from the question of whether the policy is implemented, in which regions, and under what socioeconomic conditions. This study fills a critical void in the literature by conducting comparative regional analysis. It provides a nuanced understanding of how pre-existing structural inequalities, such as varying levels of financial inclusion, informal sector composition, and digital readiness, mediated the transmission of a national monetary shock.

Empirical studies in developed countries consistently reveal that currency redesign policies are less disruptive because of strong financial infrastructure, high levels of public awareness, and digital alternatives already adopted. As such, Europe's upgrades to banknotes emphasize durability, security, and counterfeit prevention, rather than causing liquidity disruptions. In contrast, experiences in emerging economies demonstrate a more complex cost–benefit tradeoff. India's 2016 demonetization brought forward formalization and declined illicit transactions, but at high short-term costs due to the loss of income in informal sectors, stress for poorer households, disruptions in supply chains, and rural markets. Similarly, in Zimbabwe and other economies with weak institutions and high cash dependence, monetary reforms have triggered a loss of public trust and unintended socioeconomic burdens. Umoh et al. (20225, a,b) revealed that readiness for financial infrastructure, digital services, public communication, regulatory, and institutional strength are the critical moderators that determine whether the policy yields net benefits, and that informal sector size, regional inequality, and urban-rural divides frequently amplify negative impacts for some populations.

In Nigeria, Osita et al. (2023) reveal a drop in sales of Small and Medium Enterprises, an increase in operational costs, and disruptions due to cash shortages. Obilor (2023) reported that redesign imposed severe negative effects on trade, livelihoods, and day-to-day social and economic activities, particularly when market transactions depend heavily on cash. Abubakar and Yandaki (2023) report that, although the redesign was intended to ensure effective currency management, its implementation resulted in economic disruptions in local economies. Ahmad (2024) reported a correlation between currency redesign and economic growth indicators, although growth gains may be dampened by transition frictions. Udo et al. (2023) and Samuel et

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al. (2022) reported wide disparities in financial inclusion across Nigeria; the 2023 Access to Finance (A2F) state factsheet shows high banking penetration in Lagos (~91%), but dramatically low penetration in crisis-afflicted or underbanked states such as Borno (~13%) or Sokoto.

2.1 Regional / Sectoral Variation & Mediating Factors in Nigeria

Studies have revealed that redesign is unevenly distributed across Nigerian regions and sectors. The A2F survey data indicate that northern states (North-East, North-West) account for higher financial exclusion rates (exclusion ~ 38-47%) compared to southern states (South-West, South-South), with exclusion as low as 5-10%. In the rural informal sector of Anambra State, cash scarcity disproportionately affected farmers, market traders, and others who lack access to bank branches or digital banking channels, such as mobile banking applications, Internet banking portals, Unstructured Supplementary Service Data (USSD) codes, automated teller machines (ATMs), point-of-sale (POS) terminals, and agent banking networks. Studies also reveal that communication and awareness matter: A 2025 survey of the South-East and South-South revealed that awareness of digital banking was moderate during the cash crunch, but acceptance and usage improved after the crisis, with communication playing a significant role. Similarly, financial literacy studies in Niger State have shown that higher literacy correlates with higher inclusion, especially in rural areas. Thus, mediating factors such as financial infrastructure (bank branches, ATMs, digital payment platforms), education and literacy, communication and public awareness, informal sector reliance, urban vs. rural settings, and state-level institutional capacity play significant roles.

Extant literature confirms that the 2022 naira redesign had both intended and unintended effects. While some macroeconomic goals (currency management and incentives for digital transactions) were partially achieved, significant socioeconomic costs were recorded, especially in less-advantaged regions. Regional disparities in financial inclusion, infrastructure, literacy, and informal sector dependency magnify the negative effects in many states. Thus, there is a clear need for a disaggregated regional analysis that integrates both socioeconomic and financial outcomes and examines how mediating factors shape outcomes. This study conducted a disaggregated regional analysis that integrates socioeconomic and financial outcomes and examines how mediating factors shape outcomes.

2.2 Effects on Income, Employment, Consumption, and Household Welfare (Regional Perspective)

Studies of Nigeria's 2022 Currency Redesign Policy consistently reveal significant short-run disruptions to household welfare indicators, particularly in regions with low banking access and heavy reliance on cash-based transactions. Empirical results from both national surveys and regional studies show that small and medium-sized enterprises (SMEs) and informal traders experienced sharp declines in sales, profitability, and business turnover during the cash scarcity period (Osita et al., 2024; Obilor, 2023). Household consumption dropped markedly in cash-dependent communities due to limited liquidity-constrained daily purchases and forced consumption smoothing. Wage-dependent households have also reported income instability,

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delayed payments, and heightened psychological distress during a liquidity crisis (Ani et al., 2024). These adverse effects were not uniformly distributed across Nigeria. The evidence indicates that northern and rural states, where financial inclusion and banking infrastructure are weaker, suffered deeper welfare losses than the more urbanized, digitally connected southern states. National reviews and independent surveys have recorded widespread business stoppages, supply chain disruptions, and food price inflation that disproportionately affected low-income households (World Bank, 2023; Associated Press, 2023). Udo et al. (2023) further revealed financial scarcity and anxiety among rural households due to the welfare costs of policy-induced liquidity constraints.

2.3 Influence on Financial Inclusion, Cashless Adoption, and Monetary-Policy Effectiveness Across Regions

The policy had mixed effects on financial inclusion and digital payment adoption, as such during the cash scarcity period, registration for mobile banking and e-wallets surged nationwide, while electronic transfers rose sharply, particularly in Lagos, Rivers, and Abuja (NIBSS, 2023; CBN, 2023). Data from EFInA's Access to Financial Services (A2F) 2023 survey confirms measurable gains in formal financial service usage compared to pre-policy years, especially among urban and peri-urban populations with better access to banking agents and network infrastructure (EFInA, 2023). However, this expansion was uneven: States with limited POS density, unreliable connectivity, and weak KYC documentation frameworks experienced marginal inclusion gains, if any. This redesign improved the Central Bank of Nigeria (CBN) capacity to monitor currency circulation and enforce monetary control, aligning with global trends in modernizing cash management (Gupta & Saini, 2022). The liquidity crisis eroded confidence in the banking system and prompted the emergence of informal exchange markets for new notes (World Bank, 2023). Thus, while the policy advanced digital adoption in regions with pre-existing infrastructure, it simultaneously highlighted the structural inequalities that undermine the effectiveness of monetary policy at the regional level. In effect, financial inclusion gains were contingent on infrastructural readiness, a dynamic that underscores the uneven diffusion of cashless adoption across Nigeria's six geopolitical zones.

2.4 Mediating and Moderating Roles of Financial Infrastructure, Education, Informality, and Digital Readiness

Studies have identified several key mediators that explain the differential regional impacts of currency redesign policies. These include the density of financial infrastructure (bank branches, ATMs, POS agents), the level of digital readiness (Internet and mobile penetration), educational attainment, financial literacy, and the scale of the informal economy (EFInA, 2023; Samuel et al, 2023; Udo et al, 2025; Udo et al, 2023; Ahmad, 2024). In regions with robust financial and digital ecosystems, such as Lagos, Rivers, and Akwa Ibom, households and firms quickly adapted by shifting to electronic transactions and mobile transfers. Conversely, in states such as Borno, Kano, and parts of the North West, where financial institutions are sparse and digital penetration is low, households face prolonged disruptions, reduced consumption, and income insecurity (Umoh et al., 2025; Udo et al., 2025).

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These mediating factors are not merely correlated but are active mechanisms that shape policy outcomes. For example, financial literacy and education enhance individuals' ability to adopt digital payment platforms, whereas informal employment structures reduce access to formal savings and credit channels, exacerbating vulnerability to liquidity shocks. Empirical evidence supports regions with better infrastructure and higher literacy rates, shorter adjustment lags, and smaller welfare losses (Udo et al., 2023; Samuel et al., 2023). Therefore, any rigorous analysis of the redesigned policy must incorporate these structural and institutional mediators to capture the true extent of regional variation in socioeconomic outcomes.

2.5 Achievement of Macroeconomic Goals and Links to Micro-Level Welfare Across Regions

Regarding macroeconomic indicators, the redesigned policy yielded mixed results. Reports from the World Bank (2023) and Reuters (2023) indicate that the policy strengthened the integrity of the naira and improved the traceability of cash flows, thus enhancing fiscal transparency and monetary control. The reduction in excess liquidity temporarily supported anti-inflationary goals, but the abrupt cash withdrawal created short-term inflationary pressure in the food and transport sectors, worsening welfare outcomes in cash-dependent communities. Moreover, implementation challenges, including poor logistical coordination, limited stakeholder communication, and inadequate distribution networks, undermined overall effectiveness and public trust (CBN, 2023). While national-level data show gradual macroeconomic stabilization following broader reform packages in 2024–2025, these macro gains have not been translated uniformly to improve household welfare. Regional disparities persist because the channels linking macroeconomic stability to micro-level welfare, such as access to credit, digital inclusion, and price stability, remain unevenly distributed across Nigeria's geopolitical zones (World Bank, 2024; IMF, 2025). Consequently, understanding the relationship between macro-indicators (inflation, liquidity, and fiscal transparency) and micro-outcomes (income, consumption, and welfare) requires regionally disaggregated data that account for mediating factors such as financial infrastructure, education, and informality.

2.6 Conceptualizing Household Welfare within the Policy Context

Household welfare is a multidimensional construct that encompasses economic, financial, and social well-being. Classical economic theories define welfare through measurable indicators, such as income and consumption (Pigou, 1922; Deaton, 1997), while broader frameworks integrate asset ownership, access to credit, and essential services (Filmer & Pritchett, 2001). Modern multidimensional approaches, such as the Alkire-Foster framework (2011), extend the concept to include health, education, and living standards, while behavioral economists emphasize subjective well-being and financial security (Diener et al., 2003). This study adopts a comprehensive perspective that combines economic (income, employment, and consumption) and financial (access, inclusion, and savings behavior) dimensions to assess how the redesign policy has affected households' living standards and resilience.

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2.7 Theoretical Underpinning

This study integrates classical and contemporary economic theories to explain how monetary policy instruments, such as currency redesign, influence household welfare, financial inclusion, and macroeconomic stability across regions. The framework draws from the Keynesian Monetary Theory, Monetary Transmission Mechanism Theory, Financial Intermediation Theory, the Welfare Economics Framework, and contemporary theories on Financial Inclusion, Digital Finance, and Institutional Development.

Keynesian Monetary Theory (Keynes, 1936) posits that monetary interventions influence real economic activities through liquidity and aggregate demand. A sudden contraction in the money supply, such as Nigeria's 2022 currency redesign, decreases spending, output, and employment in the short run. In the long term, it has improved liquidity management, stabilized inflation, and enhanced monetary efficiency. This dual effect underpins the study's assessment of short-term welfare shocks versus the potential long-term stabilization benefits of the policy.

The Monetary Transmission Mechanism Theory (Mishkin, 1996) posits that monetary policy operates through channels such as liquidity, credit, and expectations. The effectiveness of these channels depends on the strength of the financial intermediaries and infrastructure. Nigeria's redesign policy restricted cash to tighten liquidity, but weak financial networks and limited digital infrastructure in some regions distorted policy transmission, resulting in uneven economic impact.

This theory justifies this study's focus on regional variations in financial infrastructure and digital readiness as mediating factors.
Financial Intermediation Theory (Gurley & Shaw, 1960; McKinnon, 1973) emphasizes that financial institutions bridge savers and investors, ensuring efficient capital allocation. The redesigned policy exposed disparities in banking depth and financial access by driving cash-based populations toward formal financial systems. Regions with stronger financial intermediation adapted more easily, whereas those with weak banking and agent networks faced severe disruptions. This explains the heterogeneity in the regional welfare outcomes.

The Welfare Economics Framework (Pigou, 1922; Sen, 1985; Stiglitz, 2000) provides a normative foundation for evaluating how policies affect economic and social well-being. Welfare, viewed as both material (income, consumption, and savings) and non-material (security, access, and satisfaction), is directly influenced by liquidity, transaction costs, and access to finance. While currency redesign aims to promote macro-stability, its uneven welfare effects highlight the need for inclusive, regionally sensitive policy design.

Financial Inclusion and Digital Finance Theories (Beck et al., 2007; Demirgüç-Kunt & Klapper, 2013) extend this discussion by emphasizing the role of equitable access to financial services in reducing poverty and enhancing resilience. The redesign accelerated digital transaction adoption, yet regional disparities in literacy, trust, and network reliability limited its inclusive potential.

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These theories strengthen this study's argument that digital readiness and financial literacy mediate regional differences in outcomes.

Institutional and Structural Development Theories (North, 1990; Acemoglu & Robinson, 2012) posit that economic reforms succeed and fail to strengthen institutional capacity, governance quality, and structural preparedness. Weak institutional coordination, poor logistical systems, and infrastructural deficits magnify the adverse effects of these reforms on vulnerable populations. Hence, education, informality, and institutional readiness are vital mediators that link monetary reforms to welfare outcomes. This theoretical synthesis provides a robust foundation for this study's regional analysis of Nigeria's socioeconomic and financial landscape.

3. **Methodology**

This study adopted a mixed-methods cross-sectional design with quantitative dominance. This design enables an assessment of both aggregate national effects and regional heterogeneity in the socioeconomic and financial outcomes of the currency redesign policy. This study covers the period 2021–2024, capturing the pre-policy, implementation, and immediate post-policy phases of the currency redesign exercise. It focuses on six representative states–Lagos, Akwa Ibom, Anambra, Kwara, Kano, and Borno–which collectively reflect Nigeria's economic, institutional, and geographic diversity. This selection ensures a balanced representation of urbanized, industrial, agrarian, and conflict-affected regions, which allows for comparative insight across the country's socioeconomic and infrastructural spectrum.

Table 1: Variables and Measurement

Dimension	Variable(s)	Indicators	Data Source
Dependent Variables	Household welfare	Income, consumption expenditure, employment status, household savings	Demographic and Health Surveys (DHS) and Living Standards Measurement Study (LSMS) microdata for household-level welfare and consumption analysis.
	Financial inclusion	Access to bank accounts, mobile money, POS use, ATM density	Enhancing Financial Innovation and Access (EFInA).
	Cashless transaction adoption	Volume/value of digital payments, e-wallet usage rate	CBN, NIBSS Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS)
Independent Variable	Currency redesign policy	Dummy (1 = post-redesign period; 0 = pre-redesign period)	CBN policy timeline
Mediating Variables	Financial infrastructure	Bank branches, POS agents, ATMs per 100,000	EFInA, CBN

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		adults	
	Digital readiness	Internet/mobile penetration, smartphone ownership	NBS
	Education & literacy	Adult literacy rate, financial literacy score	NBS, EFInA
	Informality	Share of informal employment	NBS
Control Variables	Inflation, interest rate, regional GDP, population density		CBN, NBS, World Bank

Source: Authors (2025)

3.1 Model Specifications

To assess the causal and moderating effects of currency redesign, this study employs Difference-in-Differences (DiD) and Moderated Mediation Regression Models. This dual-model approach was adopted to isolate the policy's specific impact and understand the nuanced mechanisms through which its effects vary across Nigeria's diverse regions. The DiD model is the gold standard for quasi-experimental research designs where random assignment is not feasible. It provides a credible estimate of the causal effect of the policy by comparing the change in outcomes between a treatment group and a control group before and after the policy intervention. While DiD establishes *if* the policy had a causal effect, the Moderated Mediation model explains *how* and *for whom* the effect was strongest. This is crucial to address the study's core focus on regional heterogeneity. This model tests the hypothesis that the policy's effect (X) on a final outcome (Y) is transmitted through an intermediary mechanism (mediator, M), and the strength of this entire pathway depends on a contextual factor (moderator, W).

Difference-in-Differences (DiD) Model:

$$Y_{it} = a + \beta_1 Post_t + \beta_2 Treatment_i + \beta_3 (Post_t x\ Treatment_i) + \gamma X_{it} + \mu_i + \varepsilon_{it} \dots\dots\dots\dots (1)$$

Where: $Y_{it} = financial$ outcome for region i at time t; $Post_t = 1$ after policy, 0 before; $Treatment_i =$ region's exposure (cash = dependence intensity or low digital readiness); $X_{it} =$ control variables; $\beta_3 =$ captures the average treatment effect of the redesign policy; $Post_t x\ Treatment_i =$ Interaction term, capturing the causal effect of the redesign on welfare

Moderated Mediation Model:

To capture the role of mediating variables:

$$Y_{it} = \infty_0 + \infty_1 Policy_t + \infty_2 M_i + \infty_3 (Policy_t\ x\ M_i) + \infty_4 Z_i + \mu_i \dots\dots\dots\dots (2)$$

Where: $M_i =$ financial infrastructure, education, digital readiness, and informality.

This model assesses how these mediators amplify or mitigate welfare and inclusion effects regionally.

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4. Results and Discussions

4.1 Descriptive Statistics

Table 2 reports summarizes of key socioeconomic and financial indicators across Nigeria's six regions over the period 2021–2024 (pre- and post-redesign). The mean household monthly income across all regions declined from ₦78,200 pre-policy to ₦63,400 post-policy. Employment levels dropped from an average of 68% to 61%. Consumption expenditure declined by 14.8% nationally, with the steepest fall recorded in Kano (–22%) and Borno (–25%). Conversely, access to digital payment channels increased from 36% pre-policy to 54% post-policy, largely in Lagos, Anambra, and Akwa Ibom.

Table 2: Descriptive Statistics

Variable	Mean (Pre-Policy)	Mean (Post-Policy)	Std. Dev.	Min	Max	Change (%)
Household Income (₦)	78,200	63,400	21,315	18,000	150,000	–18.9
Employment Rate (%)	68.0	61.0	8.2	45.0	82.0	–10.3
Consumption Expenditure (₦)	59,300	50,500	17,211	15,000	123,000	–14.8
Financial Inclusion (%)	56.0	64.0	10.4	12.0	91.0	+14.3
Digital Transaction Volume (₦ billions)	5.3	7.1	1.8	1.0	9.5	+34.0
Inflation Rate (%)	15.8	21.9	3.2	10.4	23.5	+38.6
Informality Index (%)	62.3	63.1	9.8	38.0	85.0	+1.3

Source: Author's computation using the CBN, NBS, and EFInA datasets (2025).

The descriptive results reveal a short-run contraction in welfare and the expansion of digital adoption, signaling a structural shift rather than uniform progress.

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4.2 Correlation Matrix

Table 3: Correlation Matrix

Variable	Income	Employment	Consumption	Financial Inclusion	Digital Use	Infrastructure	Education
Income	1						
Employment	0.74	1					
Consumption	0.82	0.69	1				
Inclusion	0.43	0.39	0.45	1			
Digital Use	0.38	0.36	0.42	0.81	1		
Infrastructure	0.56	0.49	0.52	0.73	0.78	1	
Education	0.47	0.41	0.49	0.66	0.59	0.68	1

Source: Author's computation (2025).

The correlation results reveal that welfare variables (income, consumption, and employment) are positively associated with structural mediators (financial infrastructure and education) and financial inclusion. Digital transaction use is strongly correlated with infrastructure (r = 0.78), confirming that digital readiness amplifies welfare resilience.

The unit root test was conducted using the Panel Augmented Dickey-Fuller (ADF) and Levin–Lin–Chu (LLC) models to assess the stationarity properties of the series before performing the regression analysis. A non-stationary time series can produce spurious results.

Table 4: Unit-Root and Stationarity Tests

Variable	ADF Statistic	Levin-Lin-Chu (LLC) Statistic	p-value	1st Difference (p-value)	Order of Integration	Decision
Income	-2.113	-4.287	0.082	0.000	I(1)	Stationary
Consumption Expenditure	-1.965	-3.942	0.097	0.001	I(1)	
Employment Rate	-1.774	-3.812	0.115	0.002	I(1)	
Household Welfare Index	-2.021	-4.066	0.091	0.000	I(1)	
Financial Inclusion Index	-1.934	-3.721	0.106	0.000	I(1)	
Digital Transaction Volume	-2.105	-4.483	0.084	0.000	I(1)	
Financial Infrastructure	-1.849	-3.567	0.112	0.002	I(1)	
Education / Literacy Level	-1.992	-3.754	0.095	0.001	I(1)	
Informality (Employment Share)	-1.735	-3.486	0.123	0.003	I(1)	
Inflation Rate	-2.214	-4.215	0.078	0.000	I(1)	
Monetary Stability Index	-2.056	-4.005	0.089	0.001	I(1)	

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Source: Author's computation (2025)
Note: Null hypothesis: The variable has a unit root. *Rejection of H_0 at $p < 0.05$ implies stationarity.*

Panel ADF and Levin–Lin–Chu test results confirm that the study variables are non-stationary at levels but stationary at the first difference I(1). Stationarity implies that the model estimation results are not spurious and that the observed nexus between policy intervention and socioeconomic outcomes is statistically significant. It also confirms that dynamic changes in income, consumption, financial inclusion, and digital adoption can be reliably attributed to policy and its mediators, rather than underlying stochastic trends. This validates the appropriateness of the Difference-in-Differences (DiD) estimation approach and use of panel regression models. The rejection of the null hypothesis of unit root at the 5% significance level across key welfare and financial indicators indicates that the data are stable for policy-effect estimation.

Model Estimation and Hypotheses Testing

Table 5: Model 1: Difference-in-Differences (DiD) Results

Household Welfare (Income Index)	**Coefficient**	**Std. Error**	**t-Stat**	**p-Value**
Post (Time Effect)	–0.174	0.048	–3.62	0.000
Treatment (Cash-Dependent Regions)	–0.263	0.051	–5.15	0.000
Post × Treatment (Policy Effect, β_3)	–0.287	0.066	–4.35	0.001
Inflation	–0.103	0.027	–3.81	0.000
Financial Inclusion	0.116	0.034	3.41	0.002
R^2	0.68			

Source: Author's DiD Estimation (2025).

The Difference-in-Differences (DiD) estimation revealed that the 2022 Nigerian currency redesign policy has a significant and heterogeneous effect on household welfare across regions. The interaction term ($\beta_3 = –0.287$, $p < 0.01$) indicates that regions with higher cash dependence experienced a 28.7% decline in household welfare after policy implementation relative to regions with greater digital adoption. This implies that cash-reliant and informal-heavy regions (e.g., Borno and Kano) were disproportionately affected by immediate liquidity shortages, which reduced business transactions and limited access to formal financial channels. The positive impact of financial inclusion (+0.116, $p < 0.01$) confirms that access to banking services, mobile money, and digital payments cushioned households from the severe welfare losses. Similarly, infrastructure availability partially offsets these negative effects, showing the importance of institutional readiness in moderating policy shocks.

These results align with Keynesian Monetary Theory, which posits that sudden contractions in money supply reduce aggregate demand and real economic activity (Keynes, 1936). In cash-dependent regions, redesign acted as a temporary contraction, suppressing household consumption and income. The results are also consistent with the Monetary Transmission

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Mechanism Theory (Mishkin, 1996), which emphasizes that policy effectiveness depends on functional transmission channels such as banking networks and digital payment systems. Where these channels are weak, policy shocks are amplified, as evidenced by the larger welfare losses in the northern and rural states.

Financial Intermediation Theory (Gurley & Shaw, 1960; McKinnon, 1973) posits that regions with developed financial systems absorb liquidity shocks better. The positive role of financial inclusion in mitigating welfare losses supports this notion, as households in digitally connected and banked regions transition more smoothly to cashless alternatives. These results support the arguments of Umoh et al. (2025a,b) and Samuel et al. (2023) regarding currency redesign in Nigeria, causing a decline in SME activity and household consumption, particularly in regions with low banking penetration. Ani et al. (2024) and Obilor (2023) report that northern and rural states heavily dependent on cash transactions experienced prolonged liquidity shortages and income instability.

Conversely, states in the south, such as Lagos, Akwa Ibom, and Anambra, with strong digital infrastructure, showed resilience, echoing findings from EFInA's Access to Finance (A2F, 2023) survey, which links digital access to smoother financial adaptation. Internationally, this result mirrors India's 2016 demonetization, in which cash-dependent informal sectors bear disproportionate welfare costs (Chandrasekhar & Ghosh, 2021; Ghatak, 2023).

The DiD results confirm Hypothesis 1: Currency redesign has a significant, regionally uneven impact on household welfare. The study's results reinforce the theoretical expectation that monetary interventions are mediated by financial infrastructure and institutional capacity, and underscore the need for context-specific, inclusive policy design in emerging economies.

Table 6: Model 2: Financial Inclusion and Cashless Adoption

Financial Inclusion Index	**Coefficient**	**Std. Error**	**t-Stat**	**p-Value**
Post (Policy Period)	0.181	0.042	4.31	0.000
Digital Infrastructure	0.273	0.056	4.85	0.000
Post × Infrastructure	0.198	0.071	2.79	0.005
Informality	–0.119	0.038	–3.13	0.003
Literacy	0.167	0.048	3.47	0.001
R^2	0.71			

Source: Author (2025)

The results of Model 2 reveal that the currency redesign policy positively and significantly promotes financial inclusion and adoption of cashless transactions across Nigeria. The post-policy period (+0.181, $p < 0.01$) revealed that, on average, financial inclusion increased by 18.1% due to policy implementation. This implies that the policy successfully nudged households and businesses toward formal financial channels, consistent with its stated objective of accelerating the transition to a cashless economy. Regions with better digital infrastructure experienced robust integration, as shown by the positive and significant impact on digital

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infrastructure of 27.3%, confirming that access to mobile banking, Internet banking, and payment platforms is a key determinant of financial inclusion.

The interaction term between the post-policy period and digital infrastructure (+0.198, $p < 0.01$) further confirms that the redesign effect is amplified in regions with robust digital ecosystems. This result underscores the moderating role of digital readiness, indicating that policy outcomes are highly contingent on preexisting technological capacity. Conversely, informality shows a significant negative effect (–0.119), implying that regions with higher shares of informal employment faced structural barriers to adopting formal financial services. Similarly, literacy positively influenced inclusion (+0.167, $p < 0.01$), revealing that financial education and general literacy enhanced the ability of households and firms to adapt to digital finance.

These results align with financial inclusion and digital finance theories (Beck et al., 2007; Demirgüç-Kunt & Klapper, 2013) emphasize equitable access to financial services to promote economic empowerment and resilience. The results also resonate with Monetary Transmission Mechanism theory (Mishkin, 1996), which posits that effective policy transmission depends on functional channels. Furthermore, Institutional and Structural Development theories (North, 1990; Acemoglu & Robinson, 2012) explain the moderating effects of informality and literacy, demonstrating that institutional readiness and human capital shape how monetary interventions affect inclusion outcomes.

The empirical evidence supports these findings. EFInA (2023) reveals surges in mobile account registrations and e-wallet usage, particularly in urban and digitally connected regions, such as Lagos, Akwa Ibom, and Anambra. Similarly, Umoh et al. (2025a,b) and Samuel et al. (2023) showed that regions with strong digital infrastructure adapted more rapidly to cashless systems, whereas informal-heavy and rural areas experienced slower adoption. International experience, including India's 2016 demonetization, echoes these patterns, where urban areas with digital banking networks shifted faster to cashless transactions than rural, informal regions (Chandrasekhar & Ghosh, 2021). Model 2 confirms Hypothesis 2, demonstrating that currency redesign significantly improves financial inclusion and cashless adoption, albeit unevenly across regions, reflecting structural and infrastructural disparities.

Table 7: Model 3: Moderated Mediation – Role of Mediating Variables

Welfare Outcome (Income Index)	**Coefficient**	**Std. Error**	**p-Value**
Policy (X)	–0.183	0.052	0.001
Financial Infrastructure (M)	0.211	0.063	0.000
Policy × M (Moderated Mediation)	0.197	0.079	0.009
Education	0.134	0.046	0.004
Informality	–0.225	0.068	0.002
Digital Readiness	0.186	0.058	0.001
R^2	0.73		

Source: Author (2025)

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The results of Model 3, which assess the moderating and mediating roles of financial infrastructure, education, informality, and digital readiness on household welfare outcomes, provide deeper insights into the regional heterogeneity observed in response to the 2022 currency redesign policy. The baseline effect of the policy ($\beta = -0.183$, $p < 0.01$) confirms that, on average, regions experienced a significant decline in household welfare following the redesign, which is consistent with earlier DiD results. The positive effect of financial infrastructure (0.211) indicates that regions with denser banking networks, higher POS agent density, and more ATMs are better able to buffer households from income and consumption shocks. Similarly, the positive impact of education (0.134) reveals that higher literacy and financial knowledge enable households to adapt more quickly to digital payment systems and formal financial channels, thereby mitigating welfare losses.

The positive interaction term between the policy and financial infrastructure (0.197) confirms that the welfare impact of the redesign is not uniform, but depends on the structural capacity of regions to absorb liquidity shocks. The negative effects of currency redesign are substantially smaller in areas with strong financial infrastructure, highlighting the critical role of institutional readiness in policy effectiveness. Conversely, informality exhibited a strong negative effect (0.225), reinforcing that region with large informal sectors, where households rely heavily on cash and have limited access to formal financial services. Digital readiness also positively influenced welfare (+0.186, $p < 0.01$), indicating that mobile penetration and Internet access facilitated smoother transitions to cashless transactions, helping households maintain their economic resilience.

These results align closely with financial intermediation theory (Gurley & Shaw, 1960; McKinnon, 1973). The effects of education and literacy are consistent with financial inclusion and digital finance theories (Beck et al., 2007; Demirgüç-Kunt & Klapper, 2013). The negative moderating role of informality echoes insights from institutional and structural development theories (North, 1990; Acemoglu & Robinson, 2012), highlighting that weak institutional engagement and reliance on informal cash economies exacerbate vulnerability to policy shocks.
Model 3 confirms Hypothesis 3, which states that financial infrastructure, education, and digital readiness positively mediate the policy's effects on household welfare, whereas high informality amplifies negative outcomes. These findings reinforce the central argument of the study: the regional effects of Nigeria's currency redesign are highly contingent on structural, institutional, and technological readiness, and effective monetary reforms must account for these mediating factors to avoid exacerbating socioeconomic disparities.

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Table 8: Model 4: Linking Macroeconomic and Micro-Level Outcomes

Household Welfare	Coefficient	Std. Error	p-Value
Inflation	–0.182	0.045	0.001
Monetary Stability Index	0.091	0.051	0.072
Fiscal Transparency Index	0.074	0.029	0.013
Regional GDP	0.107	0.035	0.004
R^2	0.65		

Source: Author (2025)

Model 4 examines the nexus between macroeconomic indicators, such as inflation, monetary stability, fiscal transparency, regional GDP, and household welfare across Nigeria's regions. The results reveal that inflation negatively and significantly impacts household welfare by 18.2%, confirming the rise in prices of goods and services during policy implementation, which eroded real income and constrained consumption, particularly in cash-dependent regions. This result aligns with the Keynesian monetary theory.

Conversely, fiscal transparency (0.074) and regional GDP (0.107) positively and modestly impact welfare, implying that improvements in governance, accountability, and local economic output partially buffer households from the negative effects of redesign. The monetary stability index showed a positive but statistically weak association (+0.091), indicating that the broader stabilization goals of the policy were only partially realized at the household level.

These results partial support for Hypothesis 4. While currency redesign achieved some macroeconomic objectives, enhancing fiscal transparency and supporting regional economic activity, the intended stabilization effects were unevenly transmitted to micro-level welfare. Regions with weaker financial infrastructure, higher informality, and limited digital access do not fully benefit from these macro gains, illustrating the critical importance of regional heterogeneity in policy effectiveness (North, 1990; Acemoglu & Robinson, 2012). The results underscore that macroeconomic stability alone is insufficient to safeguard household welfare in emerging economies. Complementary measures that strengthen local financial access, literacy, and institutional support are essential to mitigate welfare losses during monetary reforms.

The following findings were established based on the hypotheses test:

Findings Based on Hypotheses Testing

1. Regions with higher cash dependence experienced a significant decline in household welfare following currency redesign (–0.287). The interaction between the post-policy period and treatment regions confirms that northern and rural states, characterized by low banking access and higher informal activity, suffered sharper reductions in income, consumption, and employment stability than urbanized, digitally connected southern states. Financial inclusion and infrastructure partially mitigated the welfare losses.

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2. The redesign policy significantly boosted financial inclusion (0.181), particularly in regions with robust digital infrastructure. The positive interaction between the policy period and infrastructure (0.198) indicates that digital readiness amplifies the policy's effect on cashless transaction adoption. Conversely, informality negatively moderates inclusion (–0.119), while literacy enhances adoption (0.167).
3. Financial infrastructure, education, and digital readiness positively mediate the effect of redesign on household welfare, whereas informality negatively moderates it. Regions with higher financial and digital infrastructure along with better literacy rates experienced smaller welfare losses (Policy × Infrastructure = 0.197; Education = 0.134). In contrast, areas with high informal sector participation had amplified adverse effects (–0.225).
4. Fiscal transparency (0.074) and regional GDP (0.107) positively contribute to inflation, exerting a significant negative effect (–0.182). The monetary stability index shows a positive but weak association ($p = 0.091$). These results indicate that currency redesign partially achieved its macroeconomic goals, but the translation of macro gains to micro-level welfare was limited and regionally constrained, particularly in the cash-dependent, underbanked, and informal regions.

5. Conclusion

This study provides a comprehensive regional analysis of Nigeria's 2022 Currency Redesign Policy by examining its socioeconomic, financial, and business impacts across six representative states. The results reveal a nuanced picture: while the policy successfully promoted digital adoption and strengthened macroeconomic indicators such as fiscal transparency and regional GDP, its short-term socioeconomic effects were uneven and severe in some regions. Regions with high cash dependence, low banking penetration, and large informal sectors, particularly in the North East and North West experienced substantial declines in household welfare, income, employment, and consumption. Conversely, regions with robust digital infrastructure, higher literacy levels, and stronger financial institutions, such as Lagos, Anambra, and Akwa Ibom, have adapted more efficiently, mitigated welfare losses, and rapidly adopted cashless alternatives. Mediating factors, such as financial infrastructure, education, digital readiness, and informal sector composition, are critical in shaping regional outcomes. Inflation exerts a significant negative effect on household welfare, while fiscal transparency and regional economic output provide modest buffers. These results underscore that macroeconomic policy success does not automatically translate into equitable micro-level benefits, particularly in countries with pronounced structural and institutional disparities. This study confirms that Nigeria's currency redesign partially achieved its intended objectives, promoting financial inclusion, digital adoption, and monetary stability, but highlights the critical role of regional heterogeneity in determining the real-world effectiveness of monetary interventions.

Based on the results and conclusions of this study, the following recommendations were proposed:

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1. Strengthen Financial and Digital Infrastructure: Expand bank branches, ATMs, POS terminals, mobile money agents, and digital connectivity in cash-dependent and informal regions to improve policy transmission and facilitate the smooth adoption of cashless systems.
2. Enhance Financial Literacy and Public Awareness: Implement nationwide financial education programs and targeted communication campaigns to improve household and SME readiness for digital finance and monetary reform.
3. Support Informal and Rural Sectors: Provide tailored interventions, including mobile-based banking solutions, temporary liquidity assistance, and incentives to enable informal and rural populations to access formal financial channels.
4. Align Macro Policies with Regional Welfare Needs: Complement national monetary and fiscal reforms with regionally sensitive measures to protect household welfare, mitigate inflationary pressures, and ensure equitable benefits across all regions.

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