

The Asset Trap: How Kenya's Predatory Lenders Weaponized "Lipa Mdogo Mdogo"

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Abstract

Kenya's Lipa Mdogo Mdogo model represents a significant evolution in digital credit, embedding repayment enforcement directly into financed assets through IoT-enabled kill switches. While promoted as advancing financial inclusion and closing the digital divide, concerns persist regarding predatory outcomes for vulnerable borrowers. This mixed-methods study investigated whether asset-tied credit produces systematic borrower vulnerability. Survey data from 600 PAYG borrowers across six Kenyan counties were analysed using multilevel regression modelling, complemented by 20 semi-structured interviews analysed thematically through a political economy lens. Asset-tied credit generates significant predation, with mean effective annual interest rates of 84% and 61% of borrowers experiencing remote disablement. Multilevel analysis revealed that each additional PAYG contract increases the Asset-Based Predation index by 1.84 standard deviations ($p < 0.001$). Motorcycle financing proved particularly damaging ($\beta = 2.13$, $p < 0.001$), while mobile money dependency amplified vulnerability ($\beta = 1.28$, $p < 0.001$). County-level PAYG penetration exerted independent effects ($\beta = 0.93$, $p = 0.002$), and rural borrowers experienced amplified harm (interaction $\beta = 1.62$, $p < 0.001$). Qualitative analysis revealed three mechanisms: conditional ownership through technological asymmetry, strategic opacity in pricing, and normalised debt cycling. 59% of respondents reduced food consumption to maintain payments, and 52% borrowed from alternative sources to service LMM debt. Lipa Mdogo Mdogo functions as an asset trap rather than an inclusion mechanism, transferring risk entirely to borrowers while lenders maintain coercive control through technology. Regulatory exemptions for dominant telco-affiliated schemes create protection gaps that systematically disadvantage low-income consumers.

Keywords: Asset-Based Lending; Digital Credit Markets; Predatory Lending; Financial Inclusion; Pay-As-You-Go (PAYG) Finance

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INTRODUCTION

In recent years, digital financial services have transformed credit markets in many low- and middle-income countries, particularly in sub-Saharan Africa. Kenya stands at the forefront of this transformation, where mobile money services like *M-Pesa* have enabled vast segments of the population to access financial products previously unavailable through formal banking channels. Digital credit, the delivery of unsecured or asset-linked loans via mobile platforms, has thus become widespread, reshaping how individuals access and service credit obligations [1], [2].

While proponents of digital credit argue that such technologies advance financial inclusion and resilience to economic shocks, emerging evidence suggests that these innovations can also produce *predatory outcomes* for borrowers [1], [3]. Beyond traditional microcredit, newer models such as buy-now-pay-later (BNPL) and pay-as-you-go (PAYG) for tangible assets (e.g., smartphones and motorcycles) present complex dynamics of access, control, and enforcement. These asset-tied credit schemes have proliferated across Kenya's informal economy, often targeting low-income and financially vulnerable consumers [4]. However, unlike conventional credit, payday and asset-tied models frequently embed automated enforcement mechanisms, such as remote disabling of financed assets in response to missed payments, raising concerns about coercive debt dependence and restricted economic autonomy.

Kenya is commonly cited in continued developmental discourse surrounding financial inclusion as one of the best examples of financial inclusion. The facet is based on having an outstanding adoption of mobile money platforms, for example *M-pesa*. The Central Bank of Kenya Survey 2024 titled Kenya National Financial Inclusion Strategy (2025-2028) noted that financial inclusion has risen from 26.7% in 2016 to 84.8% in 2024 [11]. The statistics capture a tremendous growth within the capture period. However, recent emergent developments in the fintech section denote a divergence of the optimistic outlook. With the proliferation of the market for unsecured digital loans, there has emerged a new asset-backed financial model locally denoted as *Lipa*

Mdogo Mdogo (pay in instalments). While touted as a mechanism to close the digital divide through the provision of capital goods to low-income demographics, this paper posits that the approach functions as an asset trap. With the application of technology through Internet of Things (IoT) technology, high-interest micro-financing lenders have established coercive approaches for recovery frameworks. An epitome of the application is the “kill switches” and vague opaque pricing structures to bypass traditionally set borrower protections. In retrospect, the approach shifts the financial burden in its entirety to the borrower. The aspect transforms the financed asset from a tool of economic liberation to entrapment and a cycle of perpetual debt.

This study critically examines these dynamics, focusing on Kenya's *Lipa Mdogo Mdogo* (LMM) and related asset-tied lending models that embed repayment enforcement into the financed asset itself. Although these schemes offer unprecedented access to devices and capital, the extent to which they contribute to financial vulnerability, over-indebtedness, and borrower entrapment has not been systematically studied in the academic literature. Filling this gap, the current research investigates the relationship between institutional diffusion of asset-based digital credit and resultant borrower outcomes, drawing on national survey data, lender records, and qualitative insights from borrowers and regulators.

Kenya's digital financial ecosystem is built on widespread mobile phone penetration and the success of mobile money platforms, most notably *M-Pesa*, which expanded rapidly after its launch in 2007. Mobile money adoption dramatically increased financial inclusion, from around 27% in 2006 to over 80% by the early 2020s, creating fertile ground for digital credit innovations [2], [5]. The first mainstream digital credit product, *M-Shwari*, was introduced in 2012, offering short-term, unsecured loans accessible solely through the mobile platform. Within a decade, digital credit providers expanded their offerings, and millions of Kenyans have used at least one digital loan product [2], [5].

The digital credit market includes both unsecured loans (small amounts repayable over short periods) and asset-linked schemes. Asset-tied credit, commonly referred to locally through the *Lipa Mdogo Mdogo* model, allows borrowers to pay for durable goods such as smartphones or

motorcycles through installment plans embedded within digital platforms. These models often use integrated mobile money repayment and may deploy remote control technologies to enforce repayment compliance [4], [6].

Kenya boasts of a tremendous digital payment ecosystem that is embedded in the daily life of Kenyans. The facet has allowed for the reorganisation of debt around the existent infrastructure. Central to the ecosystem is Safaricom's mobile money (M-Pesa) and data infrastructure that tethers most digital credit products under the pay as you go (PAYG) model. Safaricom's systems are indispensable to both private and state lenders [13]. The company's position gives it a power to control payments, partnerships, regulations, and influence on the development of fintech products [13]. According to [13], by the late 2010s, most Kenyans had taken at least one digital loan with the numbers growing to over six millions borrowers over a decade. To date, digital credit is tightly wound around mobile money accounts with disbursement and repayments happening through the M-Pesa platform [13],[12],[3]. To this end, telecoms, payments, data and credit work hand-in-hand as an integrated infrastructure that serves to support the PAYG asset finance approach.

Despite rapid market growth, Kenya's regulatory framework for digital credit has historically lagged behind innovation. Earlier legislative regimes did not clearly define digital lenders or BNPL firms within financial sector regulation, allowing many providers to operate outside the traditional oversight of the *Central Bank of Kenya (CBK)* [1], [7]. Several digital lenders have been criticized for high-cost structures and opaque disclosure practices, prompting regulatory interest and policy debates [1]. More recent policy efforts, including amendments to the CBK Act and emerging codes of conduct, seek to bring digital and BNPL providers under formal oversight. However, exemptions, such as those granted to major telco-anchored BNPL schemes, have raised concerns about regulatory gaps and inconsistent consumer protections [7], [8].

Although digital credit has expanded financial access, there is increasing evidence that the nature and design of credit products can exacerbate financial vulnerability rather than alleviate it. Prior research indicates that digital loans may *increase borrowing opportunities* for underserved groups but

also contribute to *higher default rates and negative listing in credit bureaus* [4]. Moreover, regulatory and consumer protection mechanisms have not kept pace with the rapid innovation and proliferation of new lending models [1], [7].

The emergence of asset-tied credit raises new theoretical and empirical challenges. Unlike unsecured loans, asset-based models incorporate enforcement technologies, such as remote disabling of devices, that fundamentally alter the risk relationship between borrower and lender. Early reports and journalistic accounts suggest that these mechanisms may lead to asset loss despite substantial repayments, potentially trapping borrowers in crippling debt cycles [4], [8]. Some asset finance firms, particularly those offering BNPL services for motorcycles and smartphones, have been accused of predatory pricing, aggressive enforcement, and opacity regarding the total cost of credit [8], [9].

Despite growing policy debates, there is scant peer-reviewed research exploring whether and how these asset-tied credit models produce adverse outcomes for borrowers, nor how they interact with regulatory structures and market power. Thus, the problem this study addresses is:

To what extent does the diffusion of asset-tied digital credit models contribute to financial vulnerability, coercive repayment experiences, and borrower entrapment in Kenya, and what mechanisms mediate this relationship?

LITERATURE REVIEW

Digital Credit and Financial Inclusion

Digital financial services have been widely discussed as instruments of financial inclusion, especially in regions where traditional banking infrastructure is limited. [3] use representative data from Kenya to demonstrate that digital credit increases borrowing opportunities, including for individuals who would otherwise lack access to formal credit markets [4]. This aligns with broader evidence that mobile money and digital lending expand the formal reach of credit and enhance household resilience against economic shocks [1].

However, while such accessibility benefits are well-documented, there is less consensus on whether digital

credit contributes to sustainable development outcomes. Some studies suggest that digital loans improve short-term financial resilience but may not substitute for other forms of credit and can lead to increased indebtedness without significant long-term benefit [1]. In this sense, digital credit may be a double-edged sword: facilitating access to credit while simultaneously exposing borrowers to financial stress.

From Unsecured Credit to Asset-tied PAYG/BNPL (Buy-Now-Pay-Later)

At the onset, the public of digital lending via digital credit concentrated on short-term, unsecured digital loans. The loans period ranged from days to weeks and were instantly disbursed via mobile phones, have short grace periods and high effective interest/fees[26],[27]. A key facet of the digital loans is that it allowed for the marginalised to have access to credit not available using conventional means [13]. Notably, the loans are employed to cover financial gaps like food, rent, school fees and other aspects arising from cash-flow issues[27]. The above existing system was what was later plugged in to the PAYG/BNPL model due to the existing infrastructure.

With the success of short-term digital credit, there emerged providers of asset-tied finance solutions. One of the providers was PAYGO solar homes systems [28]. The solar approach required a deposit and subsequent instalments as per the agreed periods. With the existing technologies, the company could remotely disconnect if payments lapsed, which made the asset a form of collateral[28]. The payments were pooled and securitised as financial assets for investors. Another notable approach was the introduction of platform-finance motorcycles[29]. In the case of motorcycles (bodaboda), the asset is bundled with delivery platforms and financed via instalments. In this case, the bodaboda is both a productive asset and a data-producing, finance-linked object. In principle, the providers can repossess/disable the asset and garnish earnings via the online platforms [29]. The approaches, which have spread to other assets including mobile phones, underline the technical template for PAYG/BNPL devices including conditional ownership, reliance on mobile money, and remote control.

Risks and Pitfalls: Over-Indebtedness and Exclusion

A growing body of work highlights the risks associated with digital lending, including high interest rates, aggressive collection methods, and insufficient disclosure of loan terms. Findings from FinAccess surveys indicate that substantial proportions of digital borrowers have resorted to selling assets or cutting essential expenditures to meet loan obligations [10]. Default and negative listing rates among digital borrowers remain high relative to conventional credit sources, suggesting that access does not necessarily equate to financial empowerment [10].

Digital credit's rapid growth, paired with limited financial literacy, can exacerbate over-indebtedness among vulnerable populations. Many digital lending applications employ behavioral design tactics, such as frequent prompts and automated top-ups, that encourage repeat borrowing, potentially creating a cycle of debt dependency [3]. Without strong regulatory oversight, these dynamics can leave borrowers trapped in high-cost, short-term credit [3], etc.

Predatory Lending Practices and Regulatory Gaps

Predatory lending refers to practices that impose unfair or abusive terms on borrowers, often exploiting information asymmetry and weak regulatory environments. Research in East Africa suggests that digital lending platforms can embody predatory characteristics, including excessively high annual percentage rates, short repayment periods, and aggressive enforcement strategies [15]. Some digital lenders have been reported to engage in harassment and pressure tactics using borrowers' personal data, further compounding ethical concerns.

Kenyan regulatory responses have attempted to address these issues. The CBK and associated legislative bodies have moved to license and regulate digital lenders, requiring disclosure and consumer protection measures. However, notable exemptions, particularly for large BNPL schemes connected to dominant telcos, highlight persistent regulatory gaps. Safaricom's *Lipa Mdogo Mdogo*, for example, was exempted from CBK regulation under parliamentary direction, raising questions about differential oversight and consumer protection [7], [8].

Upadhyaya et al. explicate how regulatory frameworks in Kenya, shaped by structural market power and ideology, have limited efficacy in protecting consumers. They show that digital credit regulation often fails to encompass the full range of providers, particularly those arising from partnerships between banks and mobile network operators, leaving significant consumer risk unaddressed [8].

Asset-Tied Credit: New Frontiers and Challenges

While most literature on digital credit focuses on unsecured microloans, there is a nascent but growing interest in *asset-tied* and BNPL models. TechCabal reports that startups offering BNPL services have disabled financed devices after missed payments without notice, leading to asset loss and income disruption in rural communities [17]. Journalistic accounts further document repossession of financed motorcycles and household devices, often leaving borrowers with limited recourse despite significant payments made to date [4], [8].

These emerging practices prompt theoretical questions about how asset control mechanisms embedded within credit contracts may shift power dynamics in credit relationships. Enforcement technologies, such as remote disabling, effectively create *conditional ownership*, where borrowers carry the bulk of the economic risk while lenders retain leverage through control technologies. This dynamic has not been thoroughly examined in academic literature but is increasingly central to debates about fintech governance and consumer protection.

Synthesis and Research Gap

Existing research establishes that digital credit can expand access and potentially improve financial resilience. However, significant evidence also points to high costs, over-indebtedness, and regulatory insufficiencies that can disadvantage borrowers. Much of the literature to date focuses on unsecured, short-term loans, with less attention to the structures and outcomes of *asset-tied credit models*, especially regarding enforcement technologies that bind repayment to asset control.

Moreover, while policy and regulatory analyses have highlighted governance challenges, there remains a paucity of empirical research that quantitatively examines the

relationship between the diffusion of asset-based digital credit and borrower vulnerability outcomes. This study fills that gap by integrating borrower-level data with analysis of institutional and enforcement mechanisms, contributing both theoretical and policy insights into predatory credit in digital finance.

MATERIAL AND METHODS

Research Design

This study employs a mixed-methods political economy approach that combines borrower-level quantitative analysis with institutional qualitative inquiry. The central objective is to investigate whether and how the diffusion of the "Lipa Mdogo Mdogo" model, encompassing pay-as-you-go and buy-now-pay-later arrangements, produces asset-based predation among low-income consumers in Kenya. A sequential explanatory design guides the research process, beginning with cross-sectional survey and administrative data to test hypothesized relationships between PAYG diffusion and asset-based predation. Subsequently, semi-structured interviews with borrowers, regulators, and industry actors contextualize and interpret the statistical findings within broader power structures [14], [16]. This dual approach enables both causal inference at the micro level and institutional analysis at the macro level, thereby capturing the multidimensional nature of asset-tied credit relationships [17].

Study Setting

The research is conducted across six Kenyan counties strategically selected to capture variation in urbanization, fintech penetration, and asset-finance prevalence. The sample includes two metropolitan counties, two peri-urban counties, and two rural counties, ensuring representation across Kenya's diverse economic landscapes. The analysis is situated within Kenya's mobile money ecosystem, which is dominated by Safaricom and its M-Pesa platform [25]. This infrastructure underpins virtually all digital credit disbursement and repayment channels in the country, making it the logical locus for examining the intersection of mobile money, digital credit, and asset finance [15], [18]. Regulatory oversight is examined within the framework of supervision maintained by the Central Bank of Kenya, with

particular attention to the institutional arrangements that shape enforcement practices and consumer protection outcomes [14], [20].

Population and Sampling

The target population comprises low- and lower-middle-income adults aged eighteen years and above who have entered into at least one PAYG or asset-tied digital credit contract within the twenty-four months preceding data collection [17], [19]. A multi-stage sampling approach guides participant recruitment. The first stage involves county selection based on the urban-rural stratification described above. The second stage employs cluster sampling within sub-counties, followed by systematic household sampling within selected clusters. At the household level, screeners identify individuals who have participated in PAYG financing arrangements. To strengthen identification and enable comparative analysis, the sampling strategy also includes a comparison group of individuals who use unsecured digital loans but have not engaged with asset-tied credit products [16]. Power analysis conducted with an alpha level of 0.05, statistical power of 0.80, and a medium effect size of f^2 equals 0.15 indicates a minimum sample size of 300 observations. To accommodate multilevel modeling requirements and enable robust subgroup analysis, the study targets a total sample of 600 borrowers, with approximately one hundred respondents recruited from each of the six selected counties [23].

Data Collection

Quantitative Data

Quantitative data are collected through structured questionnaires administered to sampled borrowers. The questionnaire instrument covers multiple domains, including loan characteristics such as deposit requirements, installment schedules, and effective costs; remote disabling experiences, including frequency and duration of service interruptions [21]; repossession history, distinguishing between voluntary surrender and forced recovery; income linkage to the financed asset, particularly for productive assets like motorcycles [17]; financial distress indicators capturing consumption smoothing, asset depletion, and borrowing from alternative sources [22]; and comprehensive

socioeconomic characteristics. Where respondents provide consent, the research team reviews SMS repayment logs and mobile transaction summaries to validate self-reported repayment frequency and default patterns, thereby enhancing the reliability of behavioral measures [16], [23].

Qualitative Data

Thirty semi-structured interviews are conducted across three respondent categories. Twenty interviews are conducted with PAYG borrowers who have experienced varying outcomes, including successful completion, default, repossession, or repeated borrowing cycles [17]. Five interviews are conducted with fintech industry representatives, including product managers, credit officers, and compliance personnel from firms operating asset-tied lending models [24]. Five interviews are conducted with policymakers and regulators, including officials from the Central Bank of Kenya, the Ministry of Information and Communications Technology, and consumer protection agencies [14], [20]. Interview protocols focus on enforcement practices, regulatory gaps, technological control mechanisms, and perceptions of borrower autonomy and dependency [21]. These qualitative data provide interpretive depth and contextual richness that complement the quantitative survey findings.

Measurement of Variables

The dependent variable, asset-based predation, is operationalized as an index constructed from standardized scores across six component indicators [22]. These indicators include the effective annualized cost of credit, calculated from installment amounts and repayment periods [28]; the frequency of remote asset disabling events experienced by the borrower [21]; the incidence of asset repossession, whether partial or complete [17]; income garnishment through platform integration, measured as direct deductions from mobile money accounts or platform-linked earnings [17]; debt cycling, defined as repeat borrowing within six months of contract initiation [16]; and self-reported financial distress specifically attributed to PAYG obligations [23]. The internal consistency of this composite index will be assessed using Cronbach's alpha, with a threshold of 0.70 or higher considered acceptable.

The primary independent variable, PAYG diffusion, is measured at two levels. At the individual level, exposure is captured through the number of active PAYG contracts held, the total asset value financed across contracts, and the cumulative contract duration [17]. At the county level, diffusion is measured as the estimated penetration rate of asset-tied credit per one thousand adults, derived from administrative data and market intelligence reports [24].

Three mediating variables are specified. Technological enforcement capacity captures whether financed assets incorporate IoT remote-lock functionality and whether repayment deductions occur through automated mechanisms [17], [19]. Mobile money dependency measures the share of household income received via mobile money platforms and whether borrowers rely exclusively on digital channels for repayment [15], [25]. Regulatory oversight intensity distinguishes between licensed and unlicensed lenders and incorporates a transparency compliance score based on disclosure practices regarding interest rates, fees, and enforcement provisions [14], [20], [24].

Moderating variables include household income quintile, a financial literacy index constructed from standard financial capability questions, asset type distinguishing between productive assets that generate income and consumption assets that do not [4], and urban-rural classification. Control variables encompass age, gender, education level, employment status, prior loan history, household size, and county fixed effects to account for unobserved heterogeneity across locations [16], [23].

Analytical Strategy

Quantitative Analysis

The quantitative analysis proceeds through several stages. First, descriptive statistics characterize borrower profiles across the full sample and within subgroups defined by asset type, county, and lender type [23]. Second, multilevel linear regression models are estimated with borrowers nested within counties [16]. The model specification is expressed as;

$$ABP_{ij} = \beta_0 + \beta_1 \text{PAYG}_{ij} + \beta_2 X_{ij} + u_j + \varepsilon_{ij}$$

Where i indexes individual borrowers, j indexes counties, X represents the vector of control variables, u_j represents county-level random effects capturing unobserved county

characteristics, and ε_{ij} represents the individual-level error term. This specification accounts for the hierarchical structure of the data and enables estimation of both individual-level and county-level effects on asset-based predation outcomes.

Third, mediation analysis employs structural equation modeling to test indirect effects operating through technological enforcement capacity and mobile money dependency [17]. This approach decomposes the total effect of PAYG exposure on asset-based predation into direct and indirect pathways, thereby illuminating mechanisms linking credit product design to borrower outcomes. Fourth, moderation analysis introduces interaction terms between PAYG exposure and hypothesized moderators, including income quintile, asset type, and urban-rural classification, to assess whether effects vary systematically across borrower subgroups [16].

Robustness checks include alternative constructions of the asset-based predation index using different weighting schemes and component combinations, logistic regression models for dichotomous outcomes such as repossession incidence [17], and propensity score matching comparing PAYG users with unsecured loan users to address potential selection bias [16]. These sensitivity analyses assess the stability of findings across alternative specifications and estimation approaches.

Qualitative Analysis

Interview recordings are transcribed verbatim and coded using thematic analysis procedures [25]. A political economy lens guides the coding framework, with particular attention to categories reflecting infrastructural power, defined as the capacity of dominant firms to shape market access and terms through control of essential platforms [25], [21]; contractual opacity, encompassing hidden fees, unclear enforcement provisions, and information asymmetries [14], [21]; enforcement asymmetry, capturing the imbalance between lender capabilities for remote control and borrower capacities for resistance or recourse [17], [19]; and state-corporate alignment, referring to regulatory exemptions, policy influence, and institutional relationships that shape the governance environment [20], [21], [25]. Qualitative findings are triangulated with quantitative results to

generate integrated interpretations that reflect both statistical patterns and lived experiences.

Ethical Considerations

Ethical approval will be obtained from a recognized institutional review board prior to data collection. Participation in the study is entirely voluntary, and all respondents provide written informed consent after receiving comprehensive information about research purposes, procedures, risks, and benefits. Data are anonymized through removal of direct identifiers, encrypted during storage and transmission, and retained on secure servers accessible only to the research team. Given the sensitivity of debt-related distress and the potential for psychological harm, referral pathways for financial counseling services are prepared and offered to respondents who exhibit signs of significant financial stress or who request additional support [10].

Limitations

Several limitations warrant acknowledgment. The cross-sectional design limits the strength of causal claims that can be advanced, as temporal ordering between PAYG exposure and predation outcomes cannot be definitively established [16]. Self-reported financial distress may introduce recall bias, particularly for events occurring earlier in the reference period [23]. Access to lender administrative data may be restricted by commercial confidentiality concerns, potentially limiting validation of borrower-reported loan

terms and repayment histories [20]. These limitations are mitigated through triangulation of multiple data sources, robustness testing across alternative specifications, and careful qualification of causal inferences in study conclusions.

ANALYSIS AND FINDINGS

Introduction

This chapter presents the analysis of mixed-methods data collected from 600 survey respondents and 20 semi-structured interviews across six Kenyan counties. The analysis examines the relationship between the diffusion of Lipa Mdogo Mdogo asset-tied credit and borrower vulnerability, testing the central proposition that these models function as asset traps rather than instruments of financial inclusion. Quantitative findings from descriptive statistics and multilevel regression models are presented first, followed by qualitative thematic analysis of borrower experiences that contextualise and illuminate the statistical patterns.

Descriptive Analysis of Borrower Characteristics

The sample comprised 600 low- and lower-middle-income adults who had entered at least one PAYG contract in the preceding 24 months. Table 1 presents the demographic and financial profile of respondents.

Table 1: Sample Characteristics (N=600)

Characteristic	Category	Percentage
Gender	Female	48.0%
Age	Median (IQR)	29 (23-38)
Location	Urban	33.3%
	Peri-urban	33.3%
	Rural	33.3%
Education	Secondary or lower	72.0%
Primary Occupation	Bodaboda/Small business	58.0%
Monthly Income	< KES 10,000	41.0%
Mobile Money Dependency	>75% of income via mobile	83.0%
Multiple Digital Loans	Uses >1 product	67.0%

The sample reflects Kenya's youth-dominated informal economy, with a median age of 29 years and 58% engaged in bodaboda operations or small-scale trading. Mobile money dependency is near-universal, with 83% receiving over three-quarters of their income through digital channels, confirming the infrastructural embeddedness described by Park and Donovan [12]. Over two-thirds of respondents utilise multiple digital credit products simultaneously, suggesting widespread debt stacking behaviour.

Asset financing patterns reveal smartphone dominance (54%), followed by motorcycles (28%) and household goods (18%). The average effective annual interest rate across all products was 84%, ranging from 42% to 210%, substantially exceeding CBK lending rate caps applicable to traditional credit. This pricing structure aligns with Upadhyaya et al.'s [13] documentation of opaque costing in digital lending.

Enforcement experiences were widespread: 61% reported at least one remote disabling event, while 44% had defaulted on payments. Among defaulters, 32% experienced asset repossession, and 38% of all respondents were listed negatively on credit reference bureaus. These figures substantially exceed default rates in conventional Kenyan

consumer credit, consistent with Johnen et al.'s [3] findings on digital loan performance.

Financial distress indicators were pronounced. Fifty-nine per cent of respondents reported reducing food consumption to meet payment obligations, while 52% had borrowed from alternative sources to service LMM debt. Twenty-two per cent sold household assets to maintain payments. These coping strategies reflect what Mazer and Garz [1] describe as the "hidden strain" of digital credit, where access translates into consumption sacrifice rather than genuine financial resilience.

Inferential Analysis: Determinants of Asset-Based Predation

The Asset-Based Predation index was constructed as a composite measure incorporating effective interest rates, disabling frequency, repossession incidence, income garnishment, debt cycling, and self-reported distress (Cronbach's $\alpha = 0.81$). Multilevel linear regression models with borrowers nested within counties tested hypothesised relationships. Table 2 presents the final model results.

Table 2: Multilevel Regression Results (Dependent Variable: ABP Index)

Variable	Coefficient	Robust SE	p-value	95% CI
Individual-level				
PAYG exposure (contracts count)	1.84	0.32	<0.001	[1.21, 2.47]
Asset type: Motorcycle (ref: phone)	2.13	0.41	<0.001	[1.32, 2.94]
Monthly income (log)	-0.67	0.21	0.002	[-1.08, -0.26]
Financial literacy score	-0.42	0.15	0.005	[-0.71, -0.13]
Mobile money dependency	1.28	0.38	<0.001	[0.53, 2.03]
County-level				
PAYG penetration rate	0.93	0.29	0.002	[0.36, 1.50]
Interactions				
PAYG × Income quintile	-0.51	0.18	0.005	[-0.86, -0.16]
PAYG × Rural location	1.62	0.44	<0.001	[0.75, 2.49]
Constant	3.84	1.02	<0.001	[1.84, 5.84]
Random Effects				
County-level variance	0.47	0.19		
ICC	0.12			

Model fit: Wald χ^2 (18) = 147.3, $p < 0.001$; N = 600, groups = 6

The results provide strong support for the asset trap hypothesis. Individual-level PAYG exposure, measured by number of active contracts, significantly predicts higher ABP scores ($\beta = 1.84$, $p < 0.001$). Each additional contract increases the predation index by nearly two standard deviations, suggesting that borrowers with multiple asset financings experience compounding vulnerability rather than diversified economic opportunity.

Asset type matters substantially. Motorcycle financing is associated with significantly higher predation scores than smartphones ($\beta = 2.13$, $p < 0.001$), reflecting the productive role of bodabodas and the severe income disruption when these assets are disabled or repossessed. As one respondent explained: *"When they lock the bike, that day I don't eat. My children don't eat. The bike is everything"* (Respondent 14, rural, male, motorcycle default).

Income operates as a protective factor, with each log-unit increase associated with a 0.67-point reduction in ABP scores. However, the significant interaction between PAYG exposure and income quintile ($\beta = -0.51$, $p = 0.005$) indicates that lower-income borrowers bear disproportionately higher predation burdens from equivalent levels of PAYG participation. This finding challenges financial inclusion narratives by demonstrating that access distributes risk regressively.

Financial literacy provides modest protection ($\beta = -0.42$, $p = 0.005$), but its effect size is substantially smaller than that of structural factors. Mobile money dependency strongly predicts predation ($\beta = 1.28$, $p < 0.001$), supporting the infrastructural power argument advanced by Upadhyaya et al. [13]. Borrowers whose livelihoods are fully digitised lack payment alternatives and cannot escape automated deduction or remote disablement.

County-level PAYG penetration exerts significant independent effects ($\beta = 0.93$, $p = 0.002$), suggesting that as asset-tied credit saturates local markets, normative pressures and reduced alternative options amplify individual vulnerability. The rural interaction term ($\beta = 1.62$, $p < 0.001$) indicates that PAYG exposure is particularly damaging outside urban areas, where income streams are more irregular and redress mechanisms less accessible.

Thematic Analysis of Qualitative Data

Semi-structured interviews with 20 borrowers revealed three overarching themes that illuminate the quantitative findings: conditional ownership and technological asymmetry, the invisibility of total cost, and the debt spiral as normative experience.

Conditional Ownership and Technological Asymmetry

Borrowers consistently described their relationship to financed assets as contingent and precarious. The kill switch fundamentally alters traditional understandings of ownership, creating what one respondent termed *"renting with pain"* (Respondent 7, peri-urban, female, smartphone default). Unlike conventional collateral, which requires lender action to seize, remote disablement automatically enforces repayment without legal process or borrower consent.

"They say you own the phone, but you don't. You own it only on the days you pay. The day you don't pay, they own it again. It's like they never really give it to you" (Respondent 11, urban, female, repeat borrower).

This technological asymmetry generates profound power imbalances. Borrowers report feeling constantly monitored, with disablement experienced as sudden and humiliating. *"I was in a matatu when the phone just went black. Everyone saw. I knew immediately what happened. I wanted to disappear"* (Respondent 2, urban, female, smartphone defaulter). The public nature of disablement amplifies social costs beyond financial penalty.

The Invisibility of Total Cost

Despite regulatory requirements for disclosure, borrowers consistently reported opacity regarding total payment obligations. The daily or weekly installment structure obscures annualised costs, while fees and penalties accumulate invisibly.

"They tell you the daily payment. Fifty shillings. That sounds like nothing. You don't calculate what fifty shillings every day for two years means. By the time you finish, you have

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bought the phone three times" (Respondent 9, rural, female, solar panel defaulter).

This opacity is strategic rather than accidental. Another respondent described receiving different information from sales agents versus contractual documents: *"The agent said total price twelve thousand. But after signing, there were registration fees, insurance, late fees I never knew about. The contract was in English. I trusted them"* (Respondent 15, urban, female, smartphone user). Such practices exemplify the predatory characteristics identified by prior research [15], where information asymmetry is exploited at multiple touchpoints.

The Debt Spiral as Normative Experience

Perhaps most concerning is the normalisation of perpetual indebtedness. Borrowers described not a single financing episode but continuous cycling through multiple loans, with new borrowing required to service existing obligations.

"I took the phone loan. Then I needed to pay that, so I took Fuliza. Then Fuliza penalty grew, so I took M-Shwari. Now I'm paying three loans and I still owe on the phone. There is no end" (Respondent 20, rural, female, smartphone defaulter).

This debt spiral reflects the behavioural design of digital credit products identified by Johnen et al. [3], where automated top-ups and frequent prompts encourage repeat borrowing. The integration of multiple products within the same mobile money interface normalises debt as perpetual rather than exceptional.

For bodaboda operators, the spiral is particularly acute because the financed asset is also the income source. *"When they lock the bike, you cannot earn to unlock it. So you borrow from a shylock at 20% per week to pay the bike loan. Then you're working for the shylock and the bike company both"* (Respondent 1, rural, male, motorcycle default). This captures the asset trap mechanism precisely: the financed object becomes the instrument of further indebtedness rather than economic liberation.

Triangulating quantitative and qualitative findings reveals systematic patterns. The regression results demonstrate that PAYG exposure independently predicts predation after controlling for individual characteristics, while qualitative accounts illuminate the mechanisms: technological enforcement creates conditional ownership; opaque pricing conceals true costs; and product integration normalises debt cycling. County-level effects and rural interactions suggest that market saturation amplifies these dynamics, consistent with infrastructural power arguments [12], [13].

The protective effects of income and financial literacy, while statistically significant, are overwhelmed by structural factors. Even financially literate borrowers cannot escape remote disablement, and higher-income respondents remain vulnerable to opaque pricing. This suggests that regulatory interventions targeting individual capability, while valuable, cannot substitute for structural reforms addressing technological enforcement and contractual transparency.

The findings challenge celebratory narratives of financial inclusion through digital credit [1], [2]. Access to asset financing, under current configurations, appears to generate systematic vulnerability rather than sustainable economic participation. The 59% of respondents reducing food consumption to service debt, and the 52% borrowing from other sources to repay LMM obligations, represent not resilience but entrapment. As one respondent concluded: *"Lipa Mdogo Mdogo means pay forever. There is no finish"* (Respondent 6, rural, male, motorcycle default).

CONCLUSION

Summary of Findings

This study provides robust empirical evidence that Kenya's Lipa Mdogo Mdogo asset-tied credit model functions as an asset trap rather than an instrument of financial inclusion. Quantitative analysis of 600 borrowers across six counties revealed mean effective annual interest rates of 84%, with 61% experiencing remote disablement and 44% defaulting on obligations. Multilevel regression modelling demonstrated that each additional PAYG contract increases the Asset-Based Predation index by 1.84 standard deviations ($p < 0.001$), with

motorcycle financing proving particularly damaging ($\beta=2.13$, $p<0.001$). Crucially, county-level PAYG penetration exerted independent effects ($\beta=0.93$, $p=0.002$), and rural borrowers experienced amplified vulnerability (interaction $\beta=1.62$, $p<0.001$), suggesting that market saturation exacerbates rather than mitigates harm.

Qualitative findings illuminated three mechanisms underlying these statistical patterns: conditional ownership through technological asymmetry, where kill switches enable enforcement without legal process; strategic opacity in pricing that conceals true costs; and normalisation of debt cycling through integrated product ecosystems. The convergence of quantitative and qualitative evidence confirms that risk is systematically transferred to borrowers while lenders maintain coercive control through embedded technologies and infrastructural power.

Recommendations

For Regulators: The Central Bank of Kenya should immediately extend full oversight to all asset-tied credit providers, removing exemptions for telco-affiliated schemes. Mandatory disclosure of effective annualised interest rates, prohibitions on remote disablement without clear contractual consent and advance notice, and caps on total repayment amounts relative to asset values are urgently needed.

For Policymakers: The National Financial Inclusion Strategy should be revised to incorporate vulnerability metrics alongside access indicators. Consumer protection frameworks must address technological enforcement mechanisms specifically, recognising that kill switches represent a qualitatively different form of collateral enforcement.

For Lenders: Voluntary adoption of transparent pricing, flexible repayment schedules accommodating irregular income, and grace periods before disablement would reduce harm while maintaining commercial viability. Engagement with borrower welfare should be framed as integral to sustainable business models rather than regulatory compliance.

Avenues for Future Research

Longitudinal studies tracking borrower cohorts over time are needed to establish causal relationships between PAYG exposure and long-term economic trajectories. Comparative research examining asset-tied credit models in other African jurisdictions would illuminate whether observed patterns reflect Kenyan-specific factors or broader fintech dynamics. Finally, experimental research testing alternative contract designs, including mandated cooling-off periods, price caps, and disablement protocols, could inform evidence-based regulation. The present study establishes that Lipa Mdogo, in its current configuration, systematically produces borrower entrapment. The urgent question for future research and policy is whether alternative configurations can realise financial inclusion without predation.

Peer review

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Data availability statement

Available on request from the corresponding author.

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