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Monetary Policy Transmission to Household Credit:

Evidence from Uganda's Credit Registry Data

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ABSTRACT: This paper examines the effectiveness of monetary policy transmission in developing countries using loan-level data from Uganda's credit registry. We analyze more than 632,000 household loans issued by all commercial banks between 2017 and 2023, a period marked by significant policy rate fluctuations. We find that household credit, which accounts for over 50 percent of new loan accounts, responds to monetary policy: rate hikes are followed by higher lending rates and reduced loan size and maturity. Controlling for credit demand with time-varying borrower-group fixed effects, we find stronger transmission among banks with lower liquidity and capital, and those holding more government securities. The effects are more pronounced for fixed-rate loans than for floating-rate loans. In general, our results support the presence of a bank lending channel in Uganda, similar to what is observed in more advanced economies.

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WORKING PAPERS

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1 Introduction

The effectiveness of monetary policy transmission remains a central concern in policy debates in developing countries. Unlike in advanced economies, structural constraints—such as fiscal dominance, shallow financial markets, and limited institutional credibility—have historically weakened the transmission, leading to continued reliance on direct credit, moral suasion, and price controls (Frankel, 2010; Mishra *et al.*, 2012; Mishra and Montiel, 2013; Berg and Portillo, 2018). In recent years, however, many low-income countries (LICs) have made substantial progress in modernizing their monetary frameworks. Central bank independence and communication have improved, and the adoption of inflation-targeting regimes has increased by almost 40 percent since 2010, contributing to better anchored inflation expectations (Unsal *et al.*, 2022; IMF, 2023).

Empirical evidence on the strength of the monetary transmission mechanism in LICs has been mixed. Studies relying on aggregate macro data, which cannot fully disentangle demand and supply factors, often find a weak or insignificant transmission (Mishra and Montiel, 2013; Mishra *et al.*, 2014). In contrast, recent work using supervisory loan-level data has revealed more promising results. For example, Abuka *et al.* (2019) show that monetary policy tightening in Uganda significantly affects both the quantity and pricing of credit to firms—particularly through banks' balance sheet conditions—highlighting an active bank lending channel even in financially shallow environments.

This paper builds on Abuka *et al.* (2019) and expands the existing literature by investigating how monetary policy shocks are transmitted to the *household* sector—a sector that has received little attention in the literature. Yet, household credit is a significant and growing share of total private credit, accounting for about 25 percent of total bank lending in Uganda, with a rising trend in both volume and number of accounts. Indeed, over 50 percent of new loan accounts are issued to households. In LICs, household borrowing plays a crucial role not only in supporting private consumption and housing investment—both key drivers of inflation and aggregate demand—but also in financing entrepreneurship and micro and small business activities (Blattman *et al.*, 2016; Quinn and Woodruff, 2019; Jayachandran, 2021). As household credit expands rapidly, its impact on aggregate demand and inflationary pressures grows, making it an increasingly important channel for monetary policy transmission. Since financial frictions in the household sector differ from those in the corporate sector, understanding monetary transmission to households is also central to achieving financial inclusion goals.

We employ loan-level data from Uganda's credit registry to analyze how the terms of new household loans respond to changes in monetary policy and macroeconomic conditions, with a particular focus on how these effects vary across banks with different balance sheet characteristics—bank capital and liquidity-to-asset ratios, and the share of government bond holdings. Adopting the empirical strategy of Khwaja and Mian (2008), we identify credit supply effects by controlling for borrower-specific demand through time-varying borrower fixed effects.

Our rich dataset from Uganda's Credit Reference Bureaus (CRBs) provides the universe of administrative records on new household loans issued by all commercial banks and credit institutions—

representing virtually all household lending in the economy. For each loan, the CRBs collect information on loan terms (volume, interest rate, fixed vs floating rate, and maturity), loan propose, borrower location, and basic demographic characteristics (such as gender and employment status). The sample covers 632,692 new loans granted to 336,241 borrowers between 2017 and 2023. These data can be aggregated at quarterly frequency and merged with quarterly bank balance sheet information collected by the Bank of Uganda in its role as bank supervisor.

A key empirical challenge in applying the methodology of Khwaja and Mian (2008)—which decompose credit variation into time-varying bank and borrower-time fixed effects—is the requirement that borrowers engage with multiple banks, which is rarely the case in developing countries. In Uganda, for example, over 99 percent of household borrowers are served by a single commercial bank. To address this limitation, we adopt the methodology proposed by Abuka *et al.* (2019) and Degryse *et al.* (2019), which allows for the inclusion of single-bank borrowers in the identification of monetary policy transmission. We use borrower characteristics—geographic location, income bins, employment status and gender—to construct "synthetic representative borrowers" who mimic multi-bank borrowing behavior. By aggregating data at the synthetic borrower level, we preserve the original single-bank borrowers in a dataset with multiple banking relationships. This enables us to introduce demand controls using time-varying synthetic borrower fixed effects, allowing identification of time-varying cross-sectional bank credit supply shocks.

Before examining the bank lending channel, we first establish the basic pass-through of monetary policy to household credit. We find that monetary policy transmission to household credit in Uganda operates with considerable lags and varies across loan characteristics. A 100 basis point increase in the policy rate (Central Bank Rate; henceforth CBR) is associated with a 55 basis point increase in household lending rates within one quarter. However, effects on credit quantities and loan maturities emerge more gradually: loan volumes decline by 15 percent only after five quarters, while maturities contract for at least six quarters following a policy tightening.

Our main analysis implements time-varying synthetic borrower fixed effect to cleanly identify credit supply effects and examine how bank balance sheet characteristics shape the transmission mechanism. In addition to studying the conventional indicators of balance sheet strength—bank capital and liquidity ratios—we investigate the implications of the sovereign-bank nexus. Commercial banks in developing countries typically hold disproportionately large shares of their assets in government securities—more than 20 percent in Uganda, compared to around 5 percent in advanced economies. This pattern reflects a combination of financial repression, moral suasion (especially during episodes of fiscal stress), and a scarcity of alternative safe investment opportunities in underdeveloped financial markets. However, during monetary tightening, increases in policy rates can lead to valuation losses on government bonds, weakening banks' balance sheets, increasing their risk aversion, and further constraining credit supply.

Our analysis yields the following robust results for the bank lending channel: higher policy rates lower the size of new loans, increase lending rates, and reduce loan maturities. The estimated effects are statistically stronger for banks with low capital or liquidity to asset ratios, or

high share of government bond holdings. Following a 100 basis points CBR increase, banks with lower liquidity and weaker capital positions—defined as banks with liquidity and capital to total asset ratios below their respective sample medians—increase their lending rates by 58 and 28 basis points more, respectively, than banks with stronger balance sheets, thereby highlighting the bank balance sheet channel of monetary policy in Uganda. Banks with relatively large holdings of government securities pass on an additional 58 basis points. For loan volumes, less capitalized banks ratios curtail lending by about 22 percent more than highly capitalized ones following a rate hike, while those more heavily exposed to government securities reduce new loan size by around 10 percent. Bank liquidity shows no significant effects on loan quantities. Regarding loan maturity, weakly capitalized banks shorten average loan maturities by about 1.2 months, while banks with greater sovereign exposure reduce loan maturities by roughly 0.9 month. The fact that banks with large government securities holdings disproportionately curtail household loans in response to policy tightening illustrates the asset valuation channel of monetary policy and suggests fiscal dominance with potential crowding-out effects on private sector credit.

We further unpack these effects by accounting for the loan interest rate structure (fixed vs. floating). In contrast to advanced economies, fixed-rate loans in Uganda are generally smaller in size, have shorter maturities, and bear higher interest rates than floating-rate loans. While our main results hold for both types of interest rates, we find that the effects of bank characteristics on monetary policy transmission are more pronounced in the fixed-rate segment. Finally, we examine borrower heterogeneity by gender and income and find no discernible gender-based differences, but observe that low-income households receive less favorable terms, as banks with larger government security holdings pass higher interest rates and shorter maturities on these borrowers.

Related literature. Most prior works on monetary transmission in developing countries rely on aggregate macroeconomic data and structural panel Vector Autoregressions (VARs) and generally find a weak transmission of monetary policy shocks through the bank lending channel (Bwire *et al.*, 2013; Mishra and Montiel, 2013). Other studies use local projection methods and macro-level data to investigate the impacts of interest rate hikes on inflation and output growth in developing economies (Brandao-Marques *et al.*, 2020; Choi *et al.*, 2024; Deb *et al.*, 2023; Jordà, 2005). These studies provide evidence in support of effective monetary policy transmission, particularly under flexible exchange rate regimes. Following Romer and Romer (1989, 2004) and Ramey (2016), Berg *et al.* (2019) use a narrative approach to identify and assess the transmission of monetary policy shocks in selected Sub-Saharan Africa countries, finding evidence of the transmission mechanism in their sample , including Uganda. While the narrative approach helps improve the estimation of the monetary policy pass-through , limitations in identification in most macro-level studies constrain the interpretation of results.

This paper contributes to a growing body of research that leverages granular credit registry data at the bank-loan level to identify the effects of monetary policy through the bank lending channel, while controlling for the heterogeneity among banks and borrowers. Most existing stud-

ies using credit registry data focus on firms in advanced economies (Jiménez *et al.*, 2012; Ivashina *et al.*, 2022), with few applications to developing countries due to limited data availability. Using firm survey data across 63 developing countries, Dramé and Léon (2025) shows that monetary policy affects both perceptions and loan applications—raising firms' perceived credit constraints and reducing loan applications after hikes, but lifting loan applications with no discernible effect on perceived credit constraints after cuts. Our work is closely related to Abuka *et al.* (2019), who use similar supervisory credit register data to examine monetary transmission to Ugandan firms and the real economy. However, we differentiate our study in four key ways. First, we broaden the scope to include the household sector, providing a more comprehensive view of how policy changes affect different economic agents. Second, while Abuka *et al.* (2019) focus on a single monetary policy cycle (2010-2014), our analysis spans more than a decade following the introduction of the inflation-targeting regime in 2011—a period characterized by large swings in macroeconomic conditions. Third, we exploit the increasing exposure of banks to government securities over this period to examine whether banks with higher sovereign holdings are more likely to reduce lending in response to monetary tightening, shedding light on the implications of fiscal dominance for monetary policy transmission. Fourth, we leverage the heterogeneity in the loan interest rate structure and borrower characteristics to examine the differential effects of monetary policy on fixed- versus floating-rate loan origination and assess potential distributional implications of changes in the policy rate.

The rest of the paper is organized as follows. In Section 2, we present the Bank of Uganda's monetary policy developments since it adopted an inflation targeting framework. Section 3 describes the data. In Sections 4 and 5, we delineate the empirical strategy and discuss the results for the bank lending and balance sheet channels of household loan supply. Section 6 concludes.

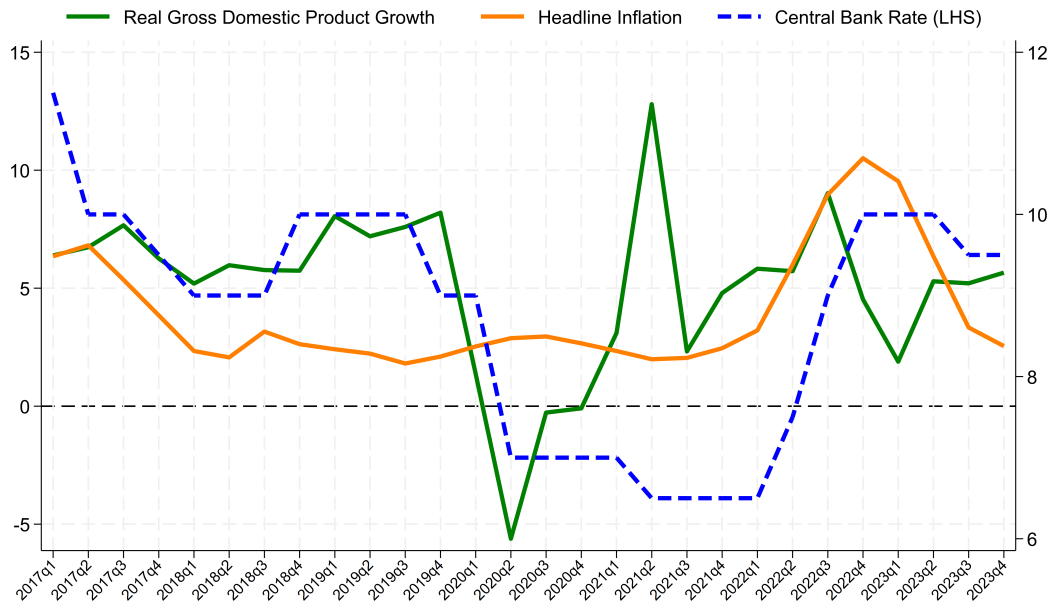
2 Background: Monetary Policy in Uganda

Uganda, a small open economy in East Africa, has undergone significant monetary policy reform over the past three decades. Between 1993 and 2011, the Bank of Uganda (BoU) conducted monetary policy using monetary aggregates. In July 2011, it adopted an inflation targeting (IT) framework, enabling more flexible and transparent policy response to a wider range of economic shocks and improving the anchoring of inflation expectations (Unsal *et al.*, 2022).

Under the IT regime, the BoU targets a medium-term core inflation rate of 5 percent over a two- to three-year horizon. Core inflation, which excludes volatile food and energy inflation, contributes about 84 percent of headline inflation. The central bank uses the Central Bank Rate (CBR) as its primary policy instrument to signal the monetary stance and guide other market interest rates, including commercial bank lending rates. Reference interest rates in Uganda are closely aligned with movements in the CBR (Annex Figure A1).

Uganda has experienced two major inflationary episodes over the last two decades. At the onset of the IT regime in 2011, headline inflation peaked at 24 percent in Q4, prompting the BoU

Figure 1: Macroeconomic Developments

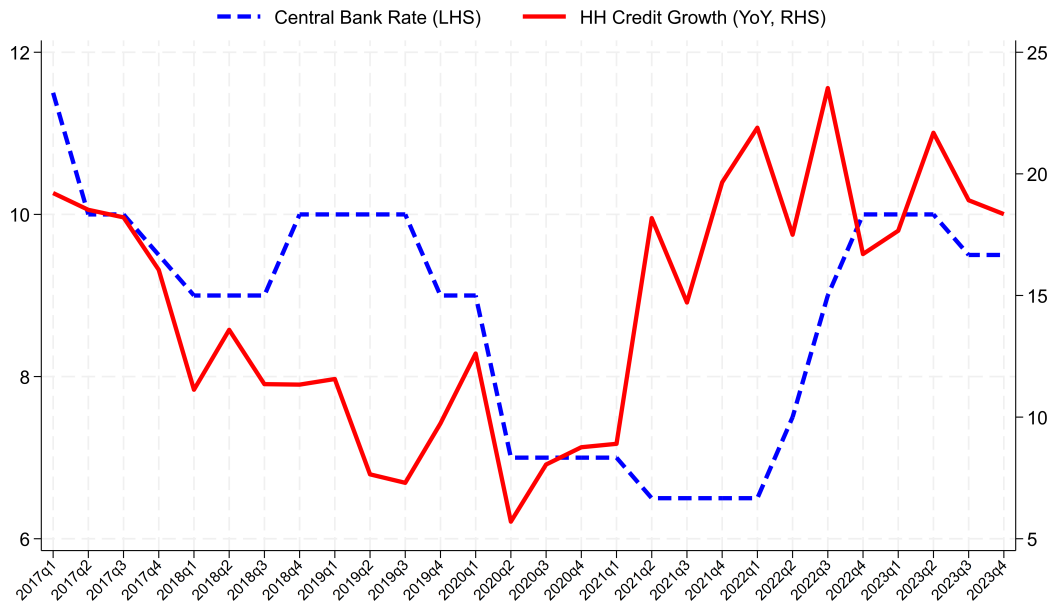


Notes: The chart plots the y-o-y GDP growth rate and headline inflation (in percent), and the Central Bank Rate (CBR).
Source: Bank of Uganda.

to raise the CBR to 23 percent, which brought inflation back to target by 2012Q3. More recently, in 2022, a combination of pandemic and global commodity price shocks pushed headline inflation to 11 percent (Figure 1). In response, the BoU tightened monetary policy, raising the CBR by 450 basis points up to 10 percent and effectively curtailing GDP growth. There were two other noticeable policy rate changes since 2017. First, the BoU hiked the policy rate by 100 basis points in 2018Q4 to curb rising imported inflation as domestic currency started to depreciate. Second, the BoU significantly eased its monetary policy stance to support economic activity during the 2020-21 pandemic-induced recession.

This paper focuses on the post-inflation targeting period from 2017, when credit registry data on household loans became available, to 2023 and examines how shifts in economic conditions and the BoU's policy stance affect bank lending to households in Uganda. As shown in Figure 2, household credit growth generally reacts with a lag to changes in the CBR, suggesting a delayed transmission of monetary policy. For example, the CBR hikes in late 2018 and 2022 were accompanied by notable slowdowns in household credit growth. The sample period captures a full monetary policy cycle, including both tightening and easing phases, and provides a valuable setting to study the monetary transmission to household credit.

Figure 2: Monetary policy and credit growth



Notes: The chart plots the Central Bank Rate (CBR) and y-o-y growth rate of commercial banks' credit to households.
Source: Bank of Uganda.

3 Data Description and Construction

3.1 Credit Reference Bureau Data

Uganda's Credit Reference Bureaus (CRBs), established in 2008, collect comprehensive data on newly originated loans. The CRBs compile monthly credit reports from all commercial banks, microfinance deposit-taking institutions, and other licensed credit institutions.[1]

Our study draws on detailed administrative credit registry data covering household loans, borrower characteristics, and bank-level indicators. We focus on loans issued by commercial banks, which account for 92.7 percent of all household loans in our sample, with the remaining loans originating from credit institutions (6.8 percent) and microfinance deposit-taking institutions (0.5 percent).

Over our sample period, household credit as a share of GDP increased steadily from 3.7 percent in 2017 to 4.4 percent in 2023, while the number of loan accounts per 1,000 adults increased from 32 to 42, reflecting deepening financial inclusion. The loan-level data includes key loan characteristics such as interest rates, loan amounts, maturity, loan type (personal, residential, education, medical, vehicle and others), and interest rate structure (fixed vs. floating). The registry also provides

[1] As of February 2023, Uganda has three licensed CRBs: Experian Uganda CRB Ltd, Metropol Uganda Ltd, and GnuGrid CRB Ltd. For further details, see Bank of Uganda's guidelines on CRBs licensing and regulations.

Table 1: Descriptive statistics for loan-level data (2017-2023)

	N	p1	mean	median	p99	S.D.
Loan Amount (mln UGX)	632,692	0.017	12.61	5.50	102	21.12
Interest Rate (%)	632,692	9	30.96	24	84	17.99
Maturity (months)	632,686	0.967	28.79	23.67	73.90	24.73

Notes: The table shows the summary statistics for loan variables based on loan-level data. N denotes the sample size; mean denotes the simple sample average; p1 and p99 denote the 1^{st} and 99^{th} percentiles; and S.D. denotes the standard deviation.

borrower demographic information, including location, gender, employment status, and income categorized into fixed brackets. Each borrower is assigned a unique identifier, which allows us to track individual borrowers across banks and over time.

Our analysis focuses on three primary loan characteristics at origination: interest rate, amount, and maturity. These variables serve as our main dependent variables. To mitigate the effects of outliers, we winsorize all three variables at the 1st and 97.5th percentiles. Table 1 reports descriptive statistics for 632,692 new household loans originated between 2017 and 2023.[2] The average loan size is about UGX 12.6 million (approximately USD 3,600), though loan amounts vary substantially. Between the 1st and 99th percentiles of the winsorized distribution, loan amounts range from UGX 17,000 (USD 5) to 102 million (USD 30,000).

Household loans in Uganda exhibit markedly different characteristics compared to those in advanced economies, particularly regarding interest rates, and maturities. The average interest rate is about 31 percent, with 99 percent of loans carrying rates above 9 percent. The average loan maturity is approximately 29 months, while only the longest 1 percent of loans extend beyond 6.2 years—substantially shorter than the multi-year or multi-decade terms common for personal or mortgage loans in higher-income economies.

In addition, unlike in advanced economies, Ugandan banks typically charge higher interest rates on fixed-rate loans than on floating-rate ones, as discussed in Section 5.2. Fixed-rate loans in Uganda are also smaller in size and have shorter maturity than their floating-rate counterparts. These distinctive features reflect higher funding costs, greater credit risk, underdeveloped financial markets, and limited borrower protections in LICs, all of which may affect how monetary policy is transmitted through the household credit channel.

3.2 Constructing Synthetic Borrowers

Our study aims to quantify how changes in monetary policy affect household credit characteristics. As shown in Section 5, our identification strategy distinguishes the effects on credit supply from demand-side credit adjustments through a rich set of time-varying fixed effects. To isolate credit supply from credit demand, the literature typically relies on loan-level data to leverage

[2] Annex Figure A2 shows the number of household loans and borrowers across districts (listed in Annex Tables A1 and A2) and over time.

Table 2: Number of banks per borrower

	Number of	Number of banks per borrower				Avg. loan	Avg. interest	Avg. maturity
	unique borrowers	p1	mean	median	p99	amount	rate (%)	(months)
Individual borrowers	336,241	1	1.0	1	1	12.61	30.96	28.79
Synthetic borrowers	1,369	1	2.6	2	11	108.70	26.14	32.99

Notes: mean denotes the simple sample average; p1, median, and p99 denote the 1st, 50th, and 99th percentiles; and sd denotes the standard deviation.

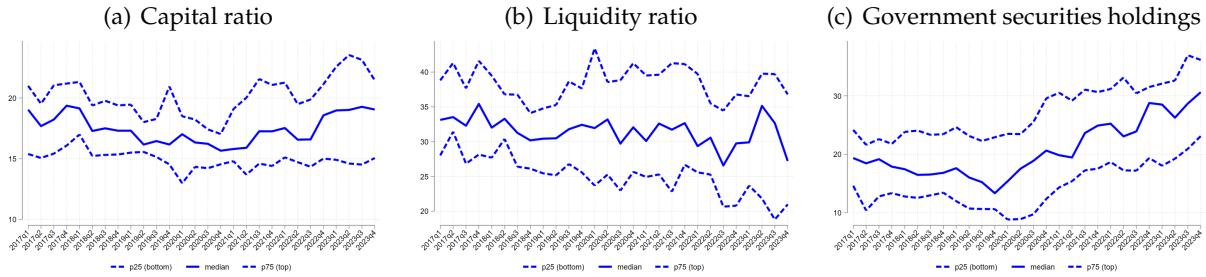
borrowers who obtain credit from multiple banks (see, among others, Khwaja and Mian, 2008; Amiti and Weinstein, 2018). When a borrower has multiple relationships, variation in lending behavior across banks—each differentially exposed to the same policy change—can be attributed to supply-side factors, under the assumption that the borrower's credit demand remains constant across lenders.

Empirically, this approach involves including borrower-time fixed effects to control for unobserved, time-varying changes in a borrower's demand for credit, thereby isolating bank-specific credit supply responses to monetary policy shocks (Jiménez *et al.*, 2012). However, this approach depends on having a sufficiently large sample of multi-bank borrowers, a particularly rare setting in developing countries where most individuals borrow from only one bank. This is exactly the case in Uganda, where almost the totality of individuals borrow exclusively from one bank, as shown in Table 2.

To address this challenge, Abuka *et al.* (2019) and Degryse *et al.* (2019) propose constructing a "*synthetic representative borrower*" by aggregating borrowers with similar observable characteristics. The idea is to approximate borrower-level credit demand fluctuations by grouping, in each quarter, borrowers who likely face similar credit demand conditions. In our setting, we classify borrowers based on four key dimensions: geographic location (district level), income brackets (high, medium, low), employment status (formal or informal), and gender. This classification results in 1,369 unique synthetic borrowers from 1,632 possible location-income-employment-gender clusters. Each cluster effectively represents a synthetic borrower who is theoretically associated with multiple banks in a given period. As Table 2 shows, each synthetic borrower is, on average, associated with 2.6 banks, with some borrower clusters linked to as many as 11 banks.

For each new loan, we use information on loan amount, interest rate, and maturity at origination. These data are then aggregated to the borrower-cluster-bank-quarter level. Within each synthetic borrower-bank-quarter combination, we compute total new loan volumes and the average interest rate and maturity, both weighted by loan size. The average loan amount granted to the synthetic borrower—which "receives" the aggregated loans of individual borrowers in the same cluster—is UGX 106.6 million, while the median loan size is much smaller, at around UGX 21 million. The weighted average lending rate and maturity at origination per synthetic borrower are 24.7 percent and 36.7 months, respectively. While the median values are close to the averages, both distributions show high variability. Loan rates range from 9 (the 1^{st} percentile of the distri-

Figure 3: Evolution of key bank balance sheet characteristics



Notes: The chart plots the evolution of the 25th, 50th, and 75th percentiles of key bank balance sheet ratios over time. The capital ratio is defined as total regulatory capital divided by total assets; the liquidity ratio as liquid assets over total assets; and government security holdings as the ratio of government securities to total assets.
Source: Bank of Uganda.

bution) to 60 percent (the 99^{th} percentile), while loan maturity ranges from 1 to 73.9 months (Table A3 in the Annex).

Another advantage of this aggregation approach is that it creates a panel structure. For each synthetic borrower, we can observe loan amounts, interest rates and maturity terms in each quarter, making it possible to compute changes over time and estimate dynamic specifications that would be challenging with the original borrower-level data.

3.3 Bank Balance Sheet Data

Uganda's banking system comprises 25 licensed commercial banks, the majority of which are privately owned and foreign-controlled. The sector is highly concentrated, as the five largest banks account for almost 89 percent of total banking system assets. Detailed quarterly balance sheet data for these banks are sourced from Bank of Uganda.

Ugandan banks are generally well-capitalized and consistently meet regulatory capital requirements (IMF, 2024). As shown in Figure 3(a), the median ratio of total regulatory capital to total assets remained around 18 percent throughout the sample period, with considerable cross-sectional variation indicated by the interquartile range. The widening of the range after 2020 suggests increasing heterogeneity in bank capitalization in the post-pandemic period.

Figure 3(b) shows that banks maintain relatively high liquidity ratios, defined as liquid assets over total assets, with the median at around 30 percent. The dispersion in liquidity ratios also increased after 2020, likely reflecting the pandemic's uneven impact on banks' liquidity positions.[3]

Banks in LICs typically hold substantial government securities, and Uganda is no exception. While the average bank in advanced economies allocates approximately 5 percent of total assets

[3]In response to rising inflationary pressures, the Bank of Uganda raised the cash reserve requirement (CRR) for commercial banks from 8 percent to 10 percent in July 2022. This contributed to an overall increase in banks' liquidity ratios.

to government securities, the median Ugandan bank holds around 20 percent (Figure 3(c), Annex Table A3). Moreover, commercial banks in Uganda significantly increased their exposure to government securities following the COVID-19 pandemic. This upward trend likely reflects both increased government borrowing needs and banks' shift toward more risk-averse portfolio allocations during a period of heightened economic uncertainty.

Annex Table A3 reports summary statistics for these three key indicators, which are central to estimate the bank lending channel, as well as other bank balance sheet characteristics used as control variables in the analysis: the return on assets (ROA), the log of total assets and the share of non-performing loans over total loans.

4 Monetary Policy Pass-through

We begin our empirical analysis by conducting a simple descriptive analysis of the pass-through from the central bank policy rate to new household loan terms, specifically, loan amount, interest rate, and maturity. For this purpose, we estimate the following equation:

$$y_{ib,t} = \alpha_i + \gamma_b + \beta_1 \Delta IR_{t-1} + \beta_2 \Delta GDP_{t-1} + \beta_3 \Delta CPI_{t-1} + \theta X_{ibt} + \epsilon_{ib,t}, \quad (1)$$

where the dependent variable $y_{ib,t}$ is either (a) the change in the (weighted average) loan interest rate, (b) the log of the volume of new loans granted, or (c) the (weighted average) maturity of loans within each synthetic borrower i and bank b in quarter t. The main variable of interest ΔIR_{t-1} is the change in the CBR. To control for business cycles and endogenous response of monetary policy to economic conditions, we control for the growth rate of real GDP (ΔGDP_{t-1}) and the change in inflation (ΔCPI_{t-1}). The vector X_{ibt} includes the lagged value of the dependent variable ($y_{ib,t-1}$) and standard bank-level characteristics: the log of total assets, return on assets (ROA), and the ratio of non-performing loans to total loans. We include borrower (α_i) and bank (γ_b) fixed effects to control for unobserved heterogeneity at the synthetic bank and borrower level. In an alternative specification, we also include synthetic borrower-bank fixed effects which control for potential sorting between borrowers and banks. Regressions are estimated with OLS and standard errors are clustered at the synthetic borrower-bank level.

Although informative, this specification does not fully address time-varying credit demand and should be viewed as a first diagnostic step in assessing the transmission of monetary policy to lending conditions across synthetic borrowers. In this respect, the coefficient of interest β_1 can be interpreted as the standard pass-through of monetary policy to loan terms. As monetary policy tightening is intended to dampen credit growth and tighten credit conditions, we expect $\beta_1 < 0$ for loan amount and maturity, while β_1 should be positive in the loan rate regressions.

Table 3 presents the results from estimating equation (1). Odd-numbered columns include bank and synthetic borrower fixed effects separately, while even-numbered columns include borrower-bank fixed effects. The results suggest that monetary tightening is associated with both reduced credit quantity and higher lending rates. For interest rates, we find a significant pass-through:

Table 3: Monetary Policy Pass-through

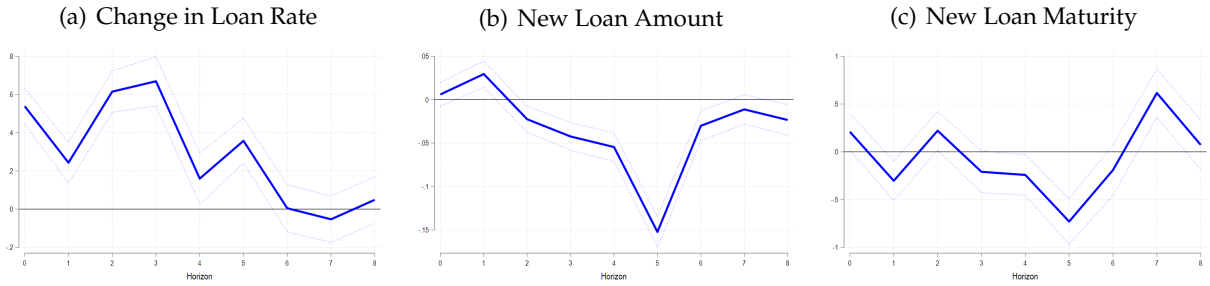
Dependent variable:	Change in Loan Rate		New Loan Amount		New Loan Maturity	
	(1)	(2)	(3)	(4)	(5)	(6)
ΔIR_{t-1}	0.55***	0.54***	-0.04***	0.01	-0.08	0.21*
	(0.057)	(0.057)	(0.009)	(0.008)	(0.115)	(0.114)
ΔGDP_{t-1}	-0.01	-0.01	-0.00*	0.00***	-0.02	-0.02
	(0.010)	(0.011)	(0.002)	(0.001)	(0.022)	(0.022)
ΔCPI_{t-1}	-0.03***	-0.03**	0.01***	0.00	0.23***	0.26***
	(0.012)	(0.012)	(0.002)	(0.002)	(0.031)	(0.034)
Observations	35,855	35,313	45,797	44,858	45,797	44,858
R-squared	0.242	0.275	0.570	0.663	0.420	0.530
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	-	Yes	-	Yes	-
Synthetic borrower FE	Yes	-	Yes	-	Yes	-
Synthetic borrower-bank FE	No	Yes	No	Yes	No	Yes

Notes: The table reports OLS estimates of Equation (1), based on quarterly household-loan observations from Uganda's credit registry. Borrowers are aggregated into synthetic clusters defined by district, income bracket, employment status, and gender. The dependent variable is (i) the quarterly change in the household loan interest rate, (ii) the log amount of new household loans, or (iii) the loan tenor at origination for synthetic borrower group i issued by bank b in quarter t. The set of controls includes lagged bank characteristics (log assets, return on assets, and non-performing loans over total loans) and the lagged dependent variable. Standard errors are clustered at the synthetic borrower-bank level. ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively.

a 100 basis point increase in the CBR is associated with a 55 basis point increase in loan interest rates in the following quarter (columns 1 and 2). The estimated effect on loan maturity is either statistically insignificant or positive on impact (column 6), which appears counterintuitive. In the following analysis, we investigate the persistence of the pass-through and show that results become more intuitive when considering a longer time horizon.

We extend our analysis to estimate the persistence of the pass-through of monetary policy using local projections (Jordà, 2005) over an 8-quarter horizon. Figure 4(a) plots the estimated pass-through coefficients (with borrower-bank fixed effects) and shows that a monetary policy tightening is associated with a protracted increase in loan rates. Following a 100 basis point CBR hike, loan rates rise cumulatively by 65 basis points after 3 quarters, with effects persisting for 6 quarters. Turning to loan amounts, Figure 4(b) shows that the statistically insignificant impact effect reported in Table 3 masks a significant lagged decline in lending volumes, which starts two quarters after the CBR change and reaches a cumulative decline of 15 percent after 5 quarters. The response of loan maturity to CBR tightening is less definitive, though Figure 4(c) suggests that maturities decline for at least 6 quarters following the tightening.

Figure 4: Monetary Policy Pass-through Dynamics



Notes: The chart shows the dynamic response of loan rate, amount, and maturity to a change in monetary policy, based on a local projections specification given by $y_{ib,t+h} - y_{ib,t-1} = \phi^h_{ib} + \beta^h_1 IR_{t-1} + \beta^h_2 \Delta GDP_{t-1} + \beta^h_3 \Delta CPI_{t-1} + \theta^h X_{ibt} + u^h_{ib,t}$, where y is the level of loan rate, loan amount and maturity of new loans. The set of controls mimics those in the even columns on Table 3. The chart tracks the movement of the estimated β^h_1 over $h = 0, 1, ..., 8$.

5 The Bank Lending Channel of Monetary Policy

Bringing the analysis at the level of the synthetic borrower allows us to exploit multiple lending relationships and to include (synthetic) borrower-time fixed effects (φ_{it}) in equation (1) to control for time-varying shifts in credit demand. Once controlling for demand, we can no longer estimate the direct pass-through of monetary policy, but we can examine the bank lending channel of monetary policy transmission (Kashyap and Stein, 2000; Jiménez *et al.*, 2012). While the standalone effects of macro variables—including the standard pass-through of the monetary policy ΔIR_{t-1}—are absorbed by the borrower-time fixed effects, we can assess how the transmission of monetary policy varies across banks, depending on specific characteristics. In practice, we estimate the following specification, which interacts each macroeconomic variable with bank-level indicators capturing balance sheet strength—namely, the liquidity and capital adequacy ratio—and exposure to government securities, as defined in Section 3.3:

$$y_{ib,t} = \varphi_{it} + \omega_{ib} + \lambda Bank\_characteristics_{b,t-1} \times \left[\Delta IR_{t-1},\ \Delta GDP_{t-1},\ \Delta CPI_{t-1}\right]' + \theta X_{ibt} + \epsilon_{ib,t}, \quad (2)$$

where *Bank_characteristics* is a row vector of dummy variables $LIQ_{b,t-1}$, $CAP_{b,t-1}$, $GOV\ SEC_{b,t-1}$ equal to one if bank b's liquidity ratio, capital ratio, or share of government securities in total assets is above the sample median in the previous period, and zero otherwise. These indicator variables interact with ΔIR_{t-1}, ΔGDP_{t-1}, ΔCPI_{t-1} individually.

The interaction terms with the policy rate (ΔIR) capture how differences in bank balance sheet strength affect the transmission of changes in the stance of monetary policy through the bank lending channel. When monetary policy tightens, more liquid and better capitalized banks are more likely to absorb the shock and transmit less of the tightening to credit supply, as they have more internal funds and are more likely to attract deposits or access market funding at lower cost (Kashyap and Stein, 1994; Bernanke, 2007; Gambacorta and Shin, 2018). As a result, we expect

that higher liquidity and capital buffers dampen the pass-through of monetary tightening to loan interest rates, while supporting larger loan amounts and longer maturities. In contrast, banks with a higher share of government securities in their portfolio are more vulnerable to valuation losses and funding constraints during tightening episodes. Consequently, we expect such banks to raise lending rates and reduce loan size and maturity more than banks less exposed to government securities. We also interact the key bank characteristics with GDP growth and inflation to account for how macroeconomic conditions could shape lending behavior differentially across banks.

Finally, our model includes synthetic borrower-bank fixed effects (ω_{ib}) to control for time-invariant unobserved heterogeneity across bank-borrower pairs and to address variation in bank presence across borrower groups. As in our baseline specification, we include the lagged value of the dependent variable and the vector X_{ibt} of bank-level controls (the log of total assets, return on assets, and non-performing loans to total loans), as well as bank characteristics and macro variables.

Threats to identification. A key identification assumption when estimating equation (2) as a test for the bank lending channel is that a borrower's credit demand is uniform across all lenders at a given point in time. However, this assumption may be violated if borrowers interact differently with different banks—due to, for example, bank specialization (Paravisini *et al.*, 2023; Blickle *et al.*, 2023) or borrower sorting—which introduces borrower-bank-time interactions that the standard fixed effects structure cannot fully capture.

In our context, several factors mitigate this concern. First, there is no evidence of meaningful bank specialization in household lending in Uganda: loan products are relatively standardized across banks, with similar terms and purposes, albeit with some degree of heterogeneity. Second, we find limited evidence of borrower sorting across banks by preference or need. While geographic proximity may play a role in bank choice, particularly in rural areas, this influence is likely stable over time.[4] Third, our empirical specification includes borrower-bank fixed effects, which absorb all time-invariant dimensions of the borrower-lender relationship, including location, risk preferences, and relationship lending effects. This helps reduce potential bias from unobserved heterogeneity in credit demand across banks.

To further assess whether potential borrower sorting effects are minimal in our data, we examine the distribution of borrowers across different bank types. For each borrower characteristic (income, gender, employment status), we compare the share of borrowers served by banks with high versus low capital ratios, liquidity ratios, and government securities holdings, as defined in equation (2).

Table 4 presents these shares separately for low-income borrowers, female borrowers and informal workers. Following Abadie and Imbens (2011), we use bias-corrected score matching with normalized differences to test whether these shares differ statistically across bank types. The re-

[4] Even in a country like the U.S., most banking relationships are local, with a median distance relatively stable and close to 5 miles in 2003 (Brevoort and Wolken, 2009). Similar evidence holds for other advanced economies (Degryse and Ongena, 2005).

Table 4: Borrower Sorting Across Bank Types

	High	Low	Normalized difference
Panel A: Capital ratio			
Low income	0.47	0.39	0.16
Female	0.37	0.36	0.02
Informal worker	0.34	0.32	0.03
Panel B: Liquidity ratio			
Low income	0.43	0.44	-0.01
Female	0.36	0.37	-0.01
Informal worker	0.34	0.33	0.02
Panel C: Government securities holdings			
Low income	0.40	0.48	-0.15
Female	0.36	0.37	-0.03
Informal worker	0.30	0.37	-0.14

Notes: The table reports shares of different types of borrowers (low income, female, informal workers) by type of banks (high vs. low capital and liquidity ratios, and holdings of government securities, in percent of total assets) along with the normalized differences based on a bias-corrected score matching test as in (Abadie and Imbens, 2011).

sults show that differences in borrower shares are smaller than 0.25 standard deviations across all comparisons, suggesting that borrowers with different characteristics have comparable credit demand across bank types.

5.1 Baseline Results

Table 5 presents results on the bank lending channel, showing that bank characteristics indeed play an important role in shaping the transmission of monetary policy to credit supply.

Looking at the interactions between bank characteristics and the change in policy rate, we observe that bank liquidity matters for loan rates, as high-liquidity banks mitigate the effect of a tightening on interest rates compared to low-liquidity banks (column 1). Following a 100 basis point tightening, households borrowing from high-liquidity banks experience loan rate increases that are 58 basis points lower than those from low-liquidity banks. However, variations in the degree of liquidity do not have a discernible effect on loan volumes and maturities (columns 2 and 3).

Highly capitalized banks also dampen monetary policy transmission to household credit, with effects visible on loan rates, quantity, and maturities. Our estimates indicate that following a rate hike, low-capital banks reduce lending by about 22 percent more than high-capital ones. Consistent with this quantity effect, high-capital banks increase loan rates by 28 basis points less than their low-capital counterparts, and extend average loan maturities by over 1 month more relative to low-capital banks.

Finally, banks with substantial government securities holdings are more likely to pass on the tightening to their borrowers. These banks extend loans that are more expensive (by 58 basis points), smaller (by around 10 percent), and shorter-term (by roughly 0.9 month) loans compared to banks with lower government securities exposure. This pattern is consistent with tighter funding constraints or greater opportunity costs during periods of monetary tightening.

Table 5: Bank Lending Channel: Baseline Results

Dependent variable:	Change in Loan Rate	New Loan Amount	New Loan Maturity
	(1)	(2)	(3)
$\Delta IR_{t-1} \times LIQ_{t-1}$	-0.58***	0.02	0.38
	(0.140)	(0.021)	(0.288)
$\Delta IR_{t-1} \times CAP_{t-1}$	-0.28**	0.22***	1.20***
	(0.138)	(0.021)	(0.290)
$\Delta IR_{t-1} \times GOV\ SEC_{t-1}$	0.58***	-0.10***	-0.88***
	(0.161)	(0.021)	(0.291)
$\Delta GDP_{t-1} \times LIQ_{t-1}$	-0.02	0.02***	0.14**
	(0.030)	(0.004)	(0.059)
$\Delta GDP_{t-1} \times CAP_{t-1}$	-0.02	-0.00	-0.11**
	(0.025)	(0.004)	(0.055)
$\Delta GDP_{t-1} \times GOV\ SEC_{t-1}$	0.10***	0.01*	-0.02
	(0.028)	(0.004)	(0.061)
$\Delta CPI_{t-1} \times LIQ_{t-1}$	0.05	-0.02***	-0.10
	(0.035)	(0.006)	(0.081)
$\Delta CPI_{t-1} \times CAP_{t-1}$	-0.13***	-0.02***	0.09
	(0.039)	(0.007)	(0.097)
$\Delta CPI_{t-1} \times GOV\ SEC_{t-1}$	0.05	0.05***	0.09
	(0.048)	(0.009)	(0.101)
Observations	32,816	42,375	42,375
R-squared	0.541	0.781	0.682
Macroeconomic controls	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes
Synthetic borrower-bank FE	Yes	Yes	Yes
Synthetic borrower-quarter FE	Yes	Yes	Yes

Notes: The table reports OLS estimates of equation (2), based on quarterly household-loan observations from the Uganda's credit registry. Borrowers are aggregated into synthetic clusters defined by district, income bracket, employment status, and gender. The dependent variable is (1) the quarterly change in the household loan interest rate, (2) the log amount of new household loans, or (3) the loan maturity at origination for synthetic borrower group i issued by bank b in quarter t. Bank characteristics include $LIQ_{b,t-1}$, $CAP_{b,t-1}$ and $GOV\ SEC_{b,t-1}$ which are dummy variables equal to 1 when the corresponding measure is above its sample median and 0 otherwise. The three bank dummies are interacted with the central bank rate change (ΔIR_{t-1}), which is the coefficient of interest, and two macroeconomic controls, real GDP growth (ΔGDP_{t-1}) and inflation (ΔCPI_{t-1}). The set of controls includes lagged bank characteristics (log assets, return on assets, and non-performing loans over total loans) and the lagged dependent variable. Standard errors are clustered at the synthetic borrower-bank level. ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively.

Overall, these results suggests that banks with more liquidity and capital buffers are better positioned to absorb monetary tightening without severely disrupting credit supply to households. Such banks are able to moderate increases in lending rates, sustain new loan volumes, and offer

longer maturities than other banks, likely by drawing on reserves and buffers to cushion the impact. In contrast, banks with disproportionately higher holdings of government securities appear more constrained. As policy rates rise, so do sovereign bond yields, deteriorating the value of existing assets. This valuation loss leads to higher pass-through to loan interest rates, reduction in loan volumes, and shorter maturities.

5.2 Fixed vs. Floating Interest Rate Loans

As discussed in Section 3.1, household loans in Uganda differ by interest rate structure—that is, whether they carry a fixed or floating interest rate. These differences are particularly pronounced compared to patterns observed in advanced economies, where fixed rate loans are typically longer-term, larger in size, and less costly than floating rate alternatives. In contrast, the Ugandan credit market displays the opposite pattern.

As shown in Table 6, fixed rate loans in Uganda are generally smaller in size, have shorter maturities, and bear higher interest rates than floating rate loans. At the individual borrower level, the average fixed rate loan amount is UGX 10.5 million, with a maturity of 22 months and an average interest rate of 35.2 percent (Panel A). By contrast, floating rate loans average UGX 16.2 million in size, last about 40 months, and carry a 23.6 percent interest rate. These differences in loan conditions sustain at the synthetic borrower level (Panel B). These observations suggest that fixed and floating rate loans may reflect distinct borrower types and credit risk profiles. This divergence raises the question whether the transmission of monetary policy through the bank lending channel differs by loan type. Specifically, in this section we examine whether our results are robust to controlling for different types of loan contracts, and in addition, whether banks adjust credit supply differently for fixed versus floating rate loans in response to changes to the policy rate.

Table 6: Loan Characteristics: Fixed Rate vs. Floating Rate

	Avg. interest rate (%)	Avg. loan amount (mln UGX)	Avg. maturity (months)
Panel A: Individual borrower level			
Fixed interest rate	35.17	10.49	22.37
Floating interest rate	23.55	16.24	40.06
Panel B: Synthetic borrower level			
Fixed interest rate	27.13	163.95	31.84
Floating interest rate	23.26	168.92	43.12

Notes: The table illustrates changes in the sample composition when accounting for interest rate type (fixed vs floating). Panel A shows the sample statistics for individual loan-level data. Panel B shows the sample statistics for synthetic borrower-level data.

We augment our baseline regression by refining the synthetic-borrower classification to account for loans with different interest rate types (fixed vs. floating). Table 7 presents results

that incorporate an additional fixed effect—synthetic borrower-loan type-time fixed effects—in Columns 1, 4, and 7. Although including loan type in the fixed effects reduced the sample size, it increases the explanatory power of our regressions while preserving our main findings. The magnitude and statistical significance of the liquidity and capital ratio coefficients remain largely unchanged from our baseline specifications. Similarly, the share of government securities holdings retains its significance in the loan amount regressions, continuing to suggest that banks with greater government securities exposure reduce credit supply more than other banks following a monetary policy tightening.

Columns 2-3, 5-6, and 8-9 in Table 7 report results separately for the floating rate and fixed rate loan subsamples. All specifications include the same set of controls as in earlier specifications, borrower-bank and borrower-time fixed effects with standard errors clustered at borrower-bank level. The findings suggest that the effects of bank characteristics on monetary policy transmission are more pronounced in the fixed rate segment, which are more consistent with the full sample results.

In Uganda's context of volatile macroeconomic conditions and limited availability of hedging tools, fixed rate loans may be riskier from the lender's perspective. This is reflected in the credit terms shown in Table 6, where fixed rate loans carry higher interest rates, shorter maturities, and smaller loan amounts per borrower, suggesting that banks price in the risk accordingly.

Table 7: Bank Lending Channel: Fixed Rate vs. Floating Rate

Dependent variable:	Change in Loan Rate			New Loan Amount			New Loan Maturity		
	All	Floating	Fixed	All	Floating	Fixed	All	Floating	Fixed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Delta IR_{t-1} \times LIQ_{t-1}$	-0.57***	-0.35**	-0.93***	0.03	-0.04	0.20***	1.35***	1.58***	1.85***
	(0.160)	(0.170)	(0.289)	(0.025)	(0.034)	(0.040)	(0.337)	(0.561)	(0.464)
$\Delta IR_{t-1} \times CAP_{t-1}$	-0.36**	-0.13	-0.66**	0.11***	0.20***	-0.09**	0.46	-0.20	0.63
	(0.167)	(0.222)	(0.279)	(0.024)	(0.040)	(0.036)	(0.314)	(0.549)	(0.462)
$\Delta IR_{t-1} \times GOV\ SEC_{t-1}$	0.23	0.08	0.66**	-0.06**	-0.08*	0.05	-0.46	-0.70	-0.74
	(0.175)	(0.223)	(0.327)	(0.025)	(0.041)	(0.043)	(0.332)	(0.563)	(0.505)
Observations	26,636	9,125	17,511	34,969	12,295	22,674	34,969	12,295	22,674
R-squared	0.563	0.567	0.563	0.837	0.816	0.845	0.774	0.699	0.789
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower–bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower–loan–quarter FE	Yes	–	–	Yes	–	–	Yes	–	–
Borrower–quarter FE	–	Yes	Yes	–	Yes	Yes	–	Yes	Yes

Notes: The table reports estimates of Equation (2) based on quarterly household-loan observations from the Ugandan credit registry. Borrowers are aggregated into synthetic clusters defined by district, income bracket, employment status, gender, and interest-rate types (fixed versus floating). The dependent variable is (i) the quarterly change in the household loan interest rate, (ii) the log amount of new household loans, or (iii) the loan tenor at origination for synthetic borrower group i issued by bank b in quarter t. Bank characteristics include $LIQ_{b,t-1}$, $CAP_{b,t-1}$ and $GOV\ SEC_{b,t-1}$ which are dummy variables equal to 1 when the corresponding measure is above its sample median and 0 otherwise. The three bank dummies are interacted with the central bank rate change (ΔIR_{t-1}), which is the reported coefficient of interest, and two macroeconomic controls, real GDP growth (ΔGDP_{t-1}) and inflation (ΔCPI_{t-1}). The set of controls includes lagged bank characteristics (log assets, return on assets, and non-performing loans over total loans) and the lagged dependent variable. Standard errors are clustered at the synthetic borrower-bank level. ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively.

Drawing on the logic of the risk-taking channel of monetary policy, banks with higher leverage (typically characterized by lower capital and liquidity ratios) face more severe agency frictions due to limited liability and may engage in more risky lending when policy rates are low (Dell'Ariccia *et al.*, 2014; Martinez-Miera and Repullo, 2017; Whited *et al.*, 2021). Therefore, when interest rates fall, highly leveraged banks with weaker balance sheets may be more willing to take on higher risks by offering more favorable terms for fixed rate loans—as reflected in lower loan rates, higher loan amount and longer tenors. These findings are reminiscent of Ivashina *et al.* (2022), who distinguish between cash flow-based and asset-based loans, and show that highly leveraged banks increase their exposure to riskier cash flow loans during policy loosening periods. In our context, fixed rate loans may similarly serve as a vehicle through which risk-taking behavior is manifestative, particularly among banks with lower capital and liquidity buffers.

5.3 Borrower Heterogeneity

Differences in borrower characteristics can affect credit demand and banks' credit risk assessment, thereby influencing the transmission of monetary policy (Ioannidou *et al.*, 2015; Paligorova and Santos, 2017). While we control for household heterogeneity through our synthetic borrower classification, here we examine how monetary policy transmission differs systematically across

different borrower types, focusing on specifically on gender and income status (Table 8).

The estimated specification extends equation (2) by including triple interactions between the change in monetary policy rate, bank characteristics, and borrower characteristics, using dummy indicators for gender ($FEMALE$) and income status ($LOW\ INC$). This approach allows us to identify whether the bank lending channel operates differently for specific borrower segments.

Results are reported in Table 8, where the first three columns refer to potential differential effects across gender and the last three columns across income status. The coefficients associated with the triple interaction terms with the female dummy suggest no significant differential effect between female and male borrowers across all three loan dimensions. However, the results show more significant heterogeneity based on borrower income levels.

Column 4 indicates that neither bank liquidity nor bank capitalization produce significant differential effects on loan pricing for low-income borrowers compared to high-income borrowers, as both triple interaction coefficients are statistically insignificant. For loan quantities (column 5), banks with higher liquidity ratios reduce lending to low-income borrowers more than to high-income borrowers following monetary tightening, as suggested by the negative and significant coefficient (-0.12) on the triple interaction term. However, these same high-liquidity banks offer longer-maturity loans to low-income borrowers relative to high-income borrowers, with the coefficient showing a positive and significant effect of approximately 1 month (column 6).

Banks with larger government securities holdings show a significant differential effect on loan pricing for low-income borrowers, charging them approximately 109 basis points more than high-income borrowers following monetary tightening (column 4), with potentially regressive distributional implications (Andersen *et al.*, 2023; Bonifacio *et al.*, 2022). However, they do not show significant differential effects on loan quantities or maturities for low-income borrowers.

Table 8: Bank Lending Channel: Borrower Heterogeneity

Dependent variable:	Gender			Income		
	Change in Loan Rate (1)	New Loan Amount (2)	New Loan Maturity (3)	Change in Loan Rate (4)	New Loan Amount (5)	New Loan Maturity (6)
$\Delta IR_{t-1} \times LIQ_{t-1}$	-0.60***	-0.02	0.68**	-0.54***	0.03	-0.10
	(0.168)	(0.025)	(0.344)	(0.196)	(0.030)	(0.422)
$\Delta IR_{t-1} \times CAP_{t-1}$	-0.33**	0.22***	0.89**	-0.43**	0.21***	1.40***
	(0.162)	(0.026)	(0.357)	(0.194)	(0.029)	(0.417)
$\Delta IR_{t-1} \times GOV\ SEC_{t-1}$	0.44**	-0.10***	-0.76**	0.11	-0.09***	-0.70*
	(0.194)	(0.026)	(0.353)	(0.217)	(0.029)	(0.409)
$\Delta IR_{t-1} \times LIQ_{t-1} \times FEMALE$	0.03	-0.02	-0.97			
	(0.298)	(0.044)	(0.607)			
$\Delta IR_{t-1} \times CAP_{t-1} \times FEMALE$	0.17	0.02	0.96			
	(0.301)	(0.044)	(0.611)			
$\Delta IR_{t-1} \times GOV\ SEC_{t-1} \times FEMALE$	0.46	0.02	-0.28			
	(0.347)	(0.042)	(0.622)			
$\Delta IR_{t-1} \times LIQ_{t-1} \times LOW\ INC$				-0.06	-0.12***	1.00*
				(0.277)	(0.042)	(0.564)
$\Delta IR_{t-1} \times CAP_{t-1} \times LOW\ INC$				0.18	-0.01	-0.66
				(0.274)	(0.043)	(0.589)
$\Delta IR_{t-1} \times GOV\ SEC_{t-1} \times LOW\ INC$				1.09***	0.01	-0.11
				(0.325)	(0.041)	(0.585)
Observations	32,648	42,375	42,375	32,648	42,375	42,375
R-squared	0.541	0.781	0.682	0.541	0.782	0.683
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
Synthetic borrower–bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Synthetic borrower–quarter FE	No	Yes	Yes	No	Yes	Yes

Notes: The table reports estimates of an extended version of equation (2) which includes triple interactions with borrower characteristics, based on quarterly household-loan observations from the Ugandan credit registry. Borrowers are aggregated into synthetic clusters defined by district, income bracket, employment status, gender, and interest-rate types (fixed versus floating). The dependent variable is (i) the quarterly change in the household loan interest rate, (ii) the log amount of new household loans, or (iii) the loan tenor at origination for synthetic borrower group i issued by bank b in quarter t. Bank characteristics include $LIQ_{b,t-1}$, $CAP_{b,t-1}$ and $GOV\ SEC_{b,t-1}$ which are dummy variables equal to 1 when the corresponding measure is above its sample median and 0 otherwise. Borrower characteristics include $FEMALE$ and $LOW\ INC$ which are dummy variables equal to 1 when the borrower is female and belongs to the low income band, respectively, 0 otherwise. The three bank dummies are interacted with the central bank rate change (ΔIR_{t-1}); along with triple interactions between the two borrower dummies and the three bank dummies and the central bank rate change (ΔIR_{t-1}), which is the reported coefficient of interest, and two macroeconomic controls, real GDP growth (ΔGDP_{t-1}) and inflation (ΔCPI_{t-1}). The set of controls includes lagged bank characteristics (log assets, return on assets, and non-performing loans over total loans) and the lagged dependent variable. Standard errors are clustered at the synthetic borrower-bank level. ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively.

5.4 Robustness

This section presents results from several robustness checks designed to address potential identification concerns and test whether our findings are sensitive to the construction of our synthetic

borrower sample.

Table 9 presents results from specifications that include additional macro-level controls to strengthen the identification of changes in monetary policy. We examine four alternative approaches: (i) including an additional monetary policy instrument—changes in the Cash Reserve Requirement (CRR); (ii) using an alternative identification strategy based on Taylor Rule residuals; (iii) incorporating additional macroeconomic controls, specifically exchange rates fluctuations, and (iv) controlling for lending banks' expectations about future lending rates. In addition, Table 10 presents results using alternative sample construction. We assess the sensitivity of our results to (i) excluding Uganda's economic dominant district, Kampala, to ensure our results are not driven by the capital city's unique characteristics; and (ii) using an alternative definition of borrowers' geographic locations based on broader regional classifications rather than district-level groupings to ascertain the robustness of our results to the administrative unit used to define the synthetic borrower location.

Including Cash Reserve Requirement. During the latter part of our sample period, the Bank of Uganda adjusted the CRR alongside changes in the CBR, raising it from 8 percent to 10 percent in July 2022 and subsequently lowering it to 9.5 in Sept 2023. Since CRR adjustments directly affect the volume of reserves banks must hold—tightening liquidity when increased and easing funding constraints when reduced—they affect banks' cost of funding and their willingness to extend credit. To account for this channel and avoid an omitted variable bias, in columns 1-3 of Table 9 we include the change in the CRR and its interaction with bank characteristics. Controlling for the CRR isolates the effect of the CBR on household credit and leaves our main conclusions unchanged. The interaction terms in the loan rate specifications remain highly significant and virtually identical in magnitude to the baseline, while most effects on loan amount and tenor also retain statistical significance and all coefficients retain their signs.

Taylor Rule. In column 4-6 of Table 9, we replace the change in the CBR with a monetary policy shock derived from deviations from a Taylor Rule. We construct this shock based on Uganda's systematic policy rate setting, which follows a standard Taylor Rule where the policy rate responds to past changes in inflation and GDP growth during the period of analysis (see Annex B for construction details). This rule-based measure isolates discretionary policy shifts that go beyond systematic response to to prevailing economic conditions. Using the Taylor Rule (TR) residual as our monetary policy shock variable, we find that the interaction coefficients remain statistically significant and signs, confirming that the main findings are robust to this alternative identification of monetary policy shocks.

Controlling for Exchange Rate Fluctuations. In Table 9 columns 7-9, we add the lagged first difference of the nominal effective exchange rate to capture exchange rate shocks that may affect monetary policy transmission through the exchange rate channel. A depreciation of the shilling

may raise the local currency cost of banks' foreign liabilities, reduce collateral values on FX-indexed loans, and amplify balance-sheet risk, all of which could constrain the supply of credit, irrespective of the policy rate. The inclusion of exchange rate changes, as well as their interaction with bank characteristics, does not materially affect the key interaction coefficients. They remain statistically significant and close in magnitude to the baseline, indicating that exchange rate variation is not a confounding factor.

Controlling for Banks' Expectations. To account for the possibility that, when extending household loans, banks may react to their expectation of future monetary policy stance, in columns 10-12 we include banks' expectations of future lending rates as additional controls. We use expectations of future lending rates in lieu of banks' expectations about changes in the CBR, as the latter are not available, and yet the two measures are likely strongly correlated.[5] Controlling for banks' expectations of future lending rates leaves our main findings broadly unchanged. The key interaction terms in the loan rate and tenor specifications remain significant, with similar sign and magnitude compared to our baseline results. The estimated effects in the loan amount estimations are somewhat weaker but consistent with their baseline counterparts, indicating the main results are robust to potential shifts in Bank's expectations of lending costs.

Excluding Kampala. We re-estimate our baseline regressions after removing loans originated in Kampala, the biggest city and the country's dominant financial hub (Figure A2). The intuition is that lending dynamics in the capital—where banks face deeper funding markets, a more diversified borrower base, and stricter competition—could potentially drive our results. By excluding Kampala, we test whether the estimated pass-through of monetary policy to household credit still holds in the rest of the country, where banks operate under different cost structures and regional shocks. The results of this exercise, reported in columns 1-3 of Table 10, confirm the baseline ones.

Alternative synthetic borrowers. We assess whether our results remain robust to an alternative definition of borrower location. Specifically, we use regions instead of districts to identify the geographic locations of synthetic borrowers in the specification where we include fixed and floating rates loan types. Columns 7-9 in Table 10 shows that our estimated interaction coefficients remain broadly significant and similar to the district-based results in Table 7. These findings show that our results are not purely driven by the administrative unit level used to define the synthetic borrower clusters, and further lend credibility to the estimated bank lending channel of monetary policy to household credit.

[5] The data come from the Bank of Uganda lending survey report which collects data from banks about their expected future lending rates and household loan demand.

Table 9: Robustness to Additional Macro-level Controls

Dependent variable:	Controlling for CRR			Taylor Rule Shocks			Controlling for Exchange Rate			Controlling for Bank Expectations		
	Change in Loan Rate	New Loan Amount	New Loan Maturity	Change in Loan Rate	New Loan Amount	New Loan Maturity	Change in Loan Rate	New Loan Amount	New Loan Maturity	Change in Loan Rate	New Loan Amount	New Loan Maturity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\Delta IR_{t-1} \times LIQ_{t-1}$	-0.51***	0.11***	1.46***				-0.72***	-0.01	0.36	-0.45**	0.00	0.25
	(0.152)	(0.022)	(0.312)				(0.143)	(0.021)	(0.292)	(0.202)	(0.028)	(0.387)
$\Delta IR_{t-1} \times CAP_{t-1}$	-0.36**	0.11***	0.66**				-0.04	0.20***	0.83***	-0.35*	0.24***	1.91***
	(0.150)	(0.022)	(0.309)				(0.135)	(0.021)	(0.295)	(0.198)	(0.028)	(0.364)
$\Delta IR_{t-1} \times GOV\ SEC_{t-1}$	0.50***	-0.01	-0.84***				0.51***	-0.07***	-0.68**	0.92***	-0.04	-1.94***
	(0.175)	(0.022)	(0.310)				(0.163)	(0.021)	(0.293)	(0.233)	(0.029)	(0.375)
$TR_{t-1} \times LIQ_{t-1}$				-4.57***	0.67***	2.11						
				(1.298)	(0.193)	(2.676)						
$TR_{t-1} \times CAP_{t-1}$				0.73	1.63***	3.98						
				(1.217)	(0.186)	(2.753)						
$TR_{t-1} \times GOV\ SEC_{t-1}$				3.41**	-0.59***	-2.37						
				(1.441)	(0.188)	(2.789)						
Observations	32,648	42,375	42,375	32,816	42,569	42,569	32,648	42,375	42,375	32,648	42,375	42,375
R-squared	0.541	0.784	0.683	0.541	0.778	0.710	0.542	0.782	0.683	0.541	0.781	0.683
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Synthetic borrower–bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Synthetic borrower–quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table explores the robustness of selected baseline results to (i) controlling for the Cash Reserve Requirement (CRR) ratio, (ii) substituting the change in CBR by a monetary policy shock constructed using Taylor Rule (TR) residuals, (iii) controlling for the exchange rate, and (iv) controlling for banks' expectations. The table reports estimates of equation (2) based on quarterly household-loan observations from the Ugandan credit registry. Borrowers are aggregated into synthetic groups defined by district, income bracket, employment status, and gender. The dependent variable $y_{ib,t}$ is (i) the quarterly change in the household loan interest rate, (ii) the log amount of new household loans, or (iii) the loan tenor at origination for synthetic borrower group i issued by bank b in quarter t. Bank characteristics include $LIQ_{b,t-1}$, $CAP_{b,t-1}$ and $GOV\ SEC_{b,t-1}$ which are dummy variables equal to 1 when the corresponding measure is above its sample median and 0 otherwise. The three bank dummies are interacted with the central bank rate change (ΔIR_{t-1}), which is the reported coefficient of interest, and two macroeconomic controls, real GDP growth (ΔGDP_{t-1}) and inflation (ΔCPI_{t-1}). The set of controls includes lagged bank characteristics (log assets, return on assets, and non-performing loans over total loans) and the lagged dependent variable. Standard errors are clustered at the synthetic borrower-bank level. ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively.

Table 10: Robustness to Alternative Samples

Dependent variable:	Excluding Kampala			Replacing District by Region		
	Change in Loan Rate (1)	New Loan Amount (2)	New Loan Maturity (3)	Change in Loan Rate (4)	New Loan Amount (5)	New Loan Maturity (6)
$\Delta IR_{t-1} \times LIQ_{t-1}$	-0.70***	-0.01	0.55*	-0.45***	-0.03	0.50*
	(0.162)	(0.022)	(0.312)	(0.117)	(0.023)	(0.296)
$\Delta IR_{t-1} \times CAP_{t-1}$	-0.36**	0.25***	1.29***	-0.19	0.21***	0.94***
	(0.160)	(0.022)	(0.318)	(0.117)	(0.023)	(0.302)
$\Delta IR_{t-1} \times GOV\ SEC_{t-1}$	0.72***	-0.11***	-1.23***	0.36***	-0.06***	-0.48
	(0.186)	(0.022)	(0.315)	(0.135)	(0.022)	(0.307)
Observations	29,683	39,081	39,081	21,452	24,815	24,815
R-squared	0.545	0.748	0.687	0.444	0.786	0.613
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
Synthetic borrower–bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Synthetic borrower–quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table explores the robustness of selected baseline results to (i) excluding the district of Kampala, and (ii) substituting districts by regions. The table reports estimates of equation (2) based on quarterly household-loan observations from the Ugandan credit registry. Borrowers are aggregated into synthetic groups defined by district, income bracket, employment status, and gender. The dependent variable $y_{ib,t}$ is (i) the quarterly change in the household loan interest rate, (ii) the log amount of new household loans, or (iii) the loan tenor at origination for synthetic borrower group i issued by bank b in quarter t. Bank characteristics include $LIQ_{b,t-1}$, $CAP_{b,t-1}$ and $GOV\ SEC_{b,t-1}$ which are dummy variables equal to 1 when the corresponding measure is above its sample median and 0 otherwise. The three bank dummies are interacted with the central bank rate change (ΔIR_{t-1}), which is the reported coefficient of interest, and two macroeconomic controls, real GDP growth (ΔGDP_{t-1}) and inflation (ΔCPI_{t-1}). The set of controls includes lagged bank characteristics (log assets, return on assets, and non-performing loans over total loans) and the lagged dependent variable. Standard errors are clustered at the synthetic borrower-bank level. ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively.

6 Conclusions

Previous studies using aggregate data suggest a weak bank lending channel for the transmission of monetary policy in developing countries. We leverage administrative micro data on household loans from Uganda's credit registry for the period 2017–2023 to study the pass-through of monetary policy to household credit, and how banks' balance sheet conditions affect their credit supply to households in response to changes in monetary policy. To identify the bank lending channel of monetary policy, we construct a synthetic borrower by aggregating all borrowers with similar observable characteristics and exploit the presence of multiple credit relationships at the synthetic borrower level. Under the assumption that all borrowers in the same group face similar credit demand shocks and each synthetic borrower's credit demand remains the same across their multiple lenders, this strategy enables us to isolate the effect of bank credit supply shocks triggered by monetary policy changes.

Our results suggest that monetary policy tightening is associated with a reduction of the supply of household credit. Specifically, policy rate hikes dampen the size of new loans to households, raise their interest rates, and shorten their maturities. Moreover, we find that differences in the strength of banks' balance sheets significantly affect the transmission of monetary policy. The pass-through is stronger for less liquid and less capitalized banks, as they face tighter funding conditions. Banks with relatively large share of government bond holdings also charge higher interest rates, curtail their loan issuance, and reduce loan maturities relative to other banks, as valuation losses on government bonds weaken their balance sheets and increase their risk aversion.

Finally, we exploit heterogeneities at loan interest rate structure and borrower demographics. We find that the effects of bank characteristics on monetary policy transmission are more pronounced for fixed rate loans than for floating-rate loans. Moreover, while the transmission of monetary policy does not vary across gender, low-income households are disproportionately affected by a monetary policy tightening, as banks with larger government security holdings pass through higher interest rates and reduce maturities more to low-income households than to richer ones.

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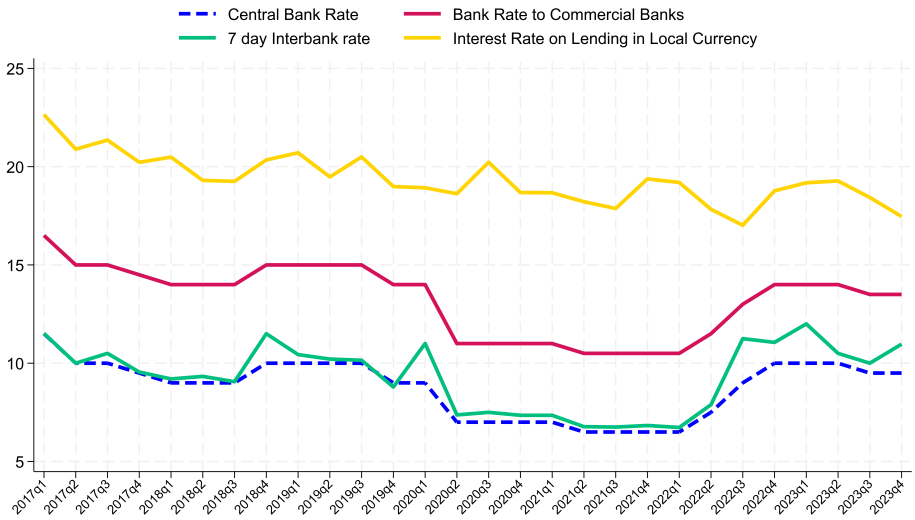
Online Appendix

A Additional Figures and Tables

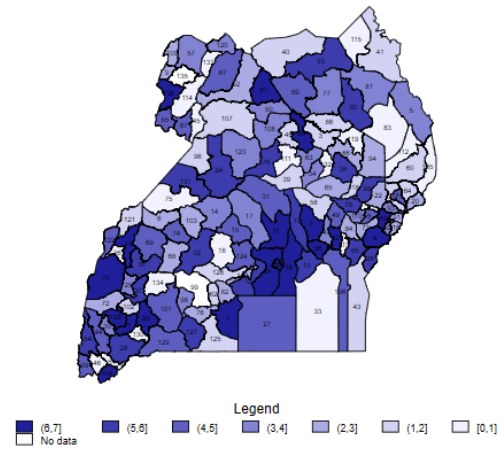
Figure A1: Monetary and lending conditions (%)



Notes: The chart plots the Central Bank Rate (CBR) along with other lending rates.
Source: Bank of Uganda Bank of Uganda.

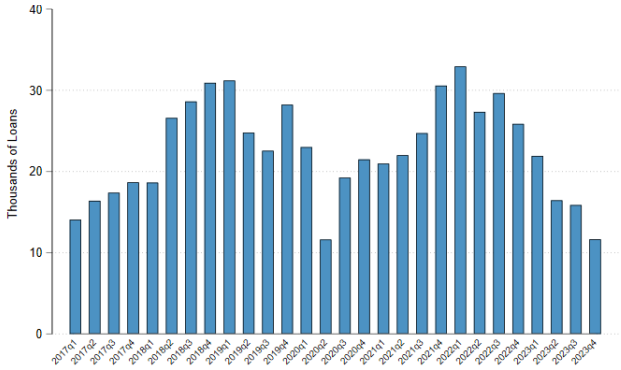
Figure A2: Number of household loans and borrowers across Uganda districts and over time

(a) Number of loans across districts

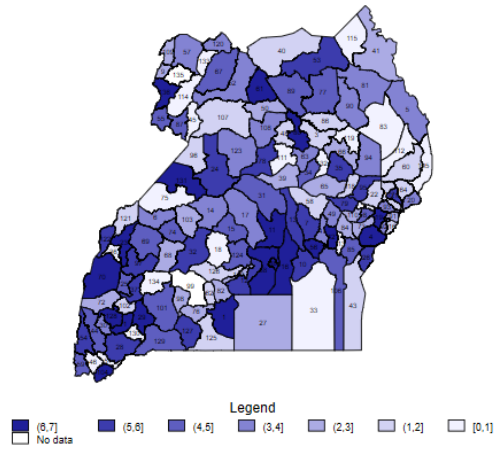


Source: Bank of Uganda
Notes:
1. Only personal and mortage loans in UGX are reported
2. Data is aggregated between 2017 and 2023
3. Sumstats: Mean = 4732, Min = 32, Max = 202884.

(b) Number of loans over time

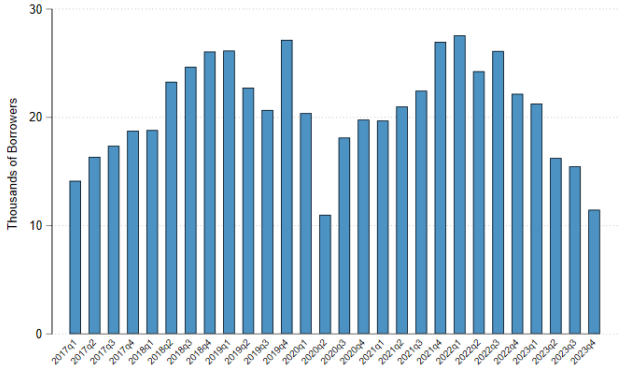


(c) Number of borrowers across districts



Source: Bank of Uganda
Notes:
1. Only personal and mortage loans in UGX are reported
2. Data is aggregated between 2017 and 2023
3. Sumstats: Mean = 2777, Min = 32, Max = 91964.

(d) Number of borrowers over time



Notes: The chart shows the distribution of the number of borrowers and household loans across Uganda's districts and over time.
Source: Bank of Uganda Bank of Uganda.

Table A1: Uganda regions

ID	Region	District codes	Number of districts
1	ACHOLI	40, 50, 52, 53, 61, 77, 89, 107	8
2	ANKOLE	28, 29, 30, 37, 71, 72, 101, 102, 128, 129, 130, 134	12
3	BUKEDI	2, 4, 8, 26, 73, 79, 110	7
4	BUNYORO	6, 24, 74, 75, 96, 103, 123, 131	8
5	BUSOGA	7, 42, 43, 47, 49, 56, 58, 84, 85, 106, 113	11
6	ELGON	19, 20, 21, 64, 91, 92, 93, 116, 117	9
7	KAMPALA	88	1
8	KARAMOJA	5, 41, 60, 81, 83, 90, 105, 112, 115	9
9	KIGEZI	44, 46, 51, 54, 59, 104	6
10	LANGO	3, 39, 48, 63, 78, 80, 86, 108, 111	9
11	NORTH BUGANDA	99, 10, 11, 13, 14, 15, 16, 17, 18, 31, 32, 33, 124	13
12	SOUTH BUGANDA	1, 12, 27, 38, 62, 76, 82, 98, 100, 125, 126, 127	12
13	TESO	22, 34, 35, 65, 66, 94, 95, 118, 119, 132	10
14	TORO	23, 25, 36, 68, 69, 70, 97, 121, 122	9
15	WEST NILE	9, 45, 55, 57, 67, 87, 109, 114, 120, 133, 135, 136	12

Notes: The table reports the official list of Uganda regions used in the analysis and the codes of the districts (Table A2) in each region.

Table A2: Uganda districts

ID	District	ID	District	ID	District	ID	District	ID	District
1	MASAKA	29	MBARARA	57	YUMBE	85	BUGIRI	113	BUGWERI
2	BUTEBO	30	MITOOMA	58	BUYENDE	86	OTUKE	114	MADI OKOLLO
3	ALEBTONG	31	NAKASONGOLA	59	KISORO	87	NEBBI	115	KARENGA
4	TORORO	32	MUBENDE	60	NAKAPIRIPIRIT	88	KAMPALA	116	NAMISINDWA
5	MOROTO	33	BUVUMA	61	GULU	89	PADER	117	BULAMBULI
6	KAGADI	34	KABERAMAIDO	62	BUKOMANSIMBI	90	ABIM	118	NGORA
7	KAMULI	35	SOROTI	63	DOKOLO	91	BUDUDA	119	KAPELEBYONG
8	BUDAKA	36	BUNYANGABU	64	KWEEN	92	MANAFWA	120	MOYO
9	MARACHA	37	IBANDA	65	SERERE	93	SIRONKO	121	NTOROKO
10	BUIKWE	38	WAKISO	66	AMURIA	94	KATAKWI	122	BUNDIBUGYO
11	LUWERO	39	AMOLATAR	67	ADJUMANI	95	KUMI	123	KIRYANDONGO
12	MPIGI	40	LAMWO	68	KYEGEGWA	96	BULIISA	124	MITYANA
13	KAYUNGA	41	KAABONG	69	KYENJOJO	97	KAMWENGE	125	KYOTERA
14	KYANKWANZI	42	IGANGA	70	KASESE	98	LYANTONDE	126	GOMBA
15	KIBOGA	43	NAMAYINGO	71	SHEEMA	99	SSEMBABULE	127	RAKAI
16	MUKONO	44	RUKUNGIRI	72	RUBIRIZI	100	BUTAMBALA	128	BUSHENYI
17	NAKASEKE	45	PAKWACH	73	BUTALEJA	101	KIRUHURA	129	ISINGIRO
18	KASSANDA	46	RUBANDA	74	KIBAALE	102	BUHWEJU	130	RWAMPARA
19	MBALE	47	LUUKA	75	KIKUUBE	103	KAKUMIRO	131	HOIMA
20	BUKWO	48	KOLE	76	LWENGO	104	KABALE	132	KALAKI
21	KAPCHORWA	49	KALIRO	77	AGAGO	105	AMUDAT	133	OBONGI
22	BUKEDEA	50	OMORO	78	APAC	106	MAYUGE	134	KAZO
23	KABAROLE	51	RUKIGA	79	PALLISA	107	NWOYA	135	TEREGO
24	MASINDI	52	AMURU	80	LIRA	108	OYAM	136	ARUA
25	KITAGWENDA	53	KITGUM	81	KOTIDO	109	KOBOKO		
26	BUSIA	54	KANUNGU	82	KALUNGU	110	KIBUKU		
27	KALANGALA	55	ZOMBO	83	NAPAK	111	KWANIA		
28	NTUNGAMO	56	JINJA	84	NAMUTUMBA	112	NABILATUK		

Notes: The table reports the official list of Uganda districts and associated codes that are used in the analysis.

Table A3: Summary statistics (2017-2023)

	N	p1	Mean	p50	p99	SD
Panel A: Synthetic borrower-level, all borrowers						
Loan Amount (mln UGX)	71,916	0.225	106.6	21.13	1,463	654.7
Interest Rate (%)	71,916	9	24.71	23	60	9.66
Maturity (months)	71,916	1	36.68	36.80	73.90	20.55
Panel B: Synthetic borrower-level, female borrowers						
Loan Amount (mln UGX)	26,465	0.225	77.71	17.30	1,139	362.5
Interest Rate (%)	26,465	9	24.50	23	60	10.01
Maturity (months)	26,465	1	36.41	36.73	73.90	20.86
Panel C: Synthetic borrower-level, low income borrowers						
Loan Amount (mln UGX)	31,782	0.150	69.02	18.24	859.7	287.4
Interest Rate (%)	31,782	10	25.70	23.62	73.81	9.87
Maturity (months)	31,782	1	37.90	39.07	73.90	20.19
Panel D: Bank variables						
Liquid Assets over Total Assets (%)	707	13.71	32.77	31.67	62.82	11.32
Capital over Total Assets (%)	707	6.839	19.39	17.10	57.96	9.803
Government Securities over Total Assets (%)	706	2.218	21.19	20.21	45.28	11.57
Return on Total Assets (%)	707	0.0409	2.451	2.221	6.828	1.623
Total Assets (ln, mln UGX)	707	10.87	13.52	13.50	16.01	1.205
Non-Performing Loan over Total Loans (%)	670	0.0586	6.597	4.951	26.22	5.623
Panel E: Macroeconomic variables						
Central Bank Rate (%)	28	6.500	8.768	9	11.50	1.462
Headline Inflation (y-o-y %)	28	1.809	3.980	2.773	10.51	2.495
GDP Growth (y-o-y %)	28	-5.618	5.084	5.731	12.80	3.474
Taylor Rule Residual	28	-0.226	-0.016	-0.010	0.115	0.069

Notes: The table reports the summary statistics of the variables based on the synthetic borrowers, clustered by location, income bin, employment status and gender, Lender level data, and Macro data for each period. N denotes the sample size; mean denotes the simple sample average; p1, p50, and p99 denote the 1st, 50th, and 99th percentiles; and SD denotes the standard deviation.

B Constructing Monetary Policy Shock Using the Taylor Rule

A key challenge in analyzing the effects of monetary policy is to address its inherent endogeneity and identify its causal effects (Ramey, 2016). This endogeneity often stems from omitted variable bias, since central banks base their policy stance on macroeconomic developments. Because monetary policy typically follows a rule, most variations in policy actions are due to the systematic response of the central bank to the current and anticipated economic conditions. Therefore, understanding monetary policy transmission requires isolating the exogenous responses of macroeconomic variables. To this end, we identify monetary policy shocks in Uganda using the residuals

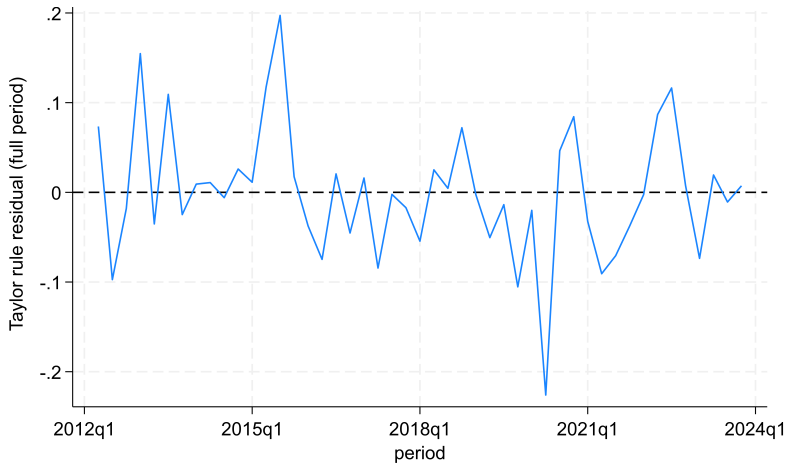
from estimating the Bank of Uganda's Taylor rule. Given the low availability of high-frequency financial market data and forecasts, using this approach seems reasonable for a low-income country.

We follow Choi *et al.* (2024) to obtain Taylor residuals by estimating equation (3) via OLS regression. Taking into account the specifics of Bank of Uganda, the rule we use implies that the systematic component of monetary policy is set considering real GDP growth gap with respect to potential GDP growth, the gap in core inflation with respect to the central bank target, and the neutral policy rate. We estimate the following specification:

$$\Delta R_t = \sum_{j=1}^{3} \rho_j \Delta R_{t-j} + \sum_{j=1}^{3} \kappa_j g_{t-j} + \sum_{j=1}^{3} \phi_j \pi_{t-j} + \psi i + \nu_t, \tag{3}$$

where ΔR_t is the change in the central bank's policy rate, g_t is the gap between the real rate of economic growth and its potential, π_t is the gap between core inflation and the central bank's inflation target, and i is the neutral policy rate. The estimated equation also includes lags of the dependent variable to allow for interest rate smoothing. To account for the fact that past developments may influence current monetary policy decisions, we include three lags of all variables. Macroeconomic data are sourced from Bank of Uganda. Figure B3 illustrates the estimated monetary policy shocks ν_t that we use as robustness test to our baseline empirical exercise.

Figure B3: Monetary policy shocks estimated from Taylor rule residuals



Notes: The chart shows the time series of discretionary monetary policy shocks constructed as residual from estimating the Bank of Uganda's Taylor rule.
Source: Bank of Uganda Bank of Uganda.

PUBLICATIONS

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