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FINANCIAL INCLUSION, INFLATION AND THE POLICY RATE

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Abstract

Financial inclusion is a vital intention for policymakers around the arena, as its ambition is to provide access to financial services to individuals and agencies who have historically been excluded from the formal monetary device. One of the key advantages of economic inclusion is that it can assist to lessen poverty and promote economic growth, by supplying individuals and corporations with the gear they need to keep, make investments, and manage their cash correctly. However, financial inclusion isn't always without its demanding situations, especially in nations with high stages of inflation. Inflation can erode the price of financial savings and make it hard for individuals and groups to plan. This is particularly true in growing nations, in which inflation charges can be excessive and volatile, and in which many human beings have constrained get entry to monetary offerings. One tool that policymakers can use to combat inflation is the coverage rate. The coverage fee is the hobby rate that primary banks charge on loans to business banks, and it is a key tool for dealing with inflation and monetary boom. By elevating or decreasing the coverage fee, critical banks can affect the value of borrowing and lending within the economy, and thereby influence financial interest and inflation. The study investigated the connection between economic inclusion, inflation, and coverage price, the usage of records from quite a number of growing international locations. The study finds that there may be robust advantageous dating among monetary inclusion and monetary growth and that this dating is especially sturdy in international locations with high ranges of inflation. The study also locates that a policy change is a powerful tool for coping with inflation and that it is able to assist to sell financial inclusion with the aid of making credit scores extra affordable and reachable to individuals and groups. However, studies find that there are vital alternate-offs to be made while using of the policy change to control inflation and promote economic inclusion. Raising interest quotes to fight inflation could make credit scores greater steeply-priced and reduce get right of entry to economic offerings for low-earnings families and small companies. This can have negative consequences for an economic boom and poverty reduction, particularly in countries with excessive degrees of inequality.

Keywords: Financial Inclusion, Monetary Policy Rules, Emerging and Developing Economies

Introduction

Financial inclusion, inflation, and the cover charge are crucial subjects that have won big attention in the literature. Financial inclusion refers to the procedure of providing get entry to economic services and products to people and organizations that are excluded from the formal economic system. Inflation refers to the sustained increase in the standard charge level of products and services in an economic system,

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at the same time as the policy price refers back to the interest rate set by way of the principal bank to persuade the level of inflation and financial growth.

Several studies have highlighted the significance of financial inclusion in selling economic growth and lowering poverty. Beck and Demirgüç-Kunt (2009) discovered that growing financial inclusion could cause higher tiers of economic increase, especially in growing international locations. Moreover, getting admission to economic services can grow family income and intake and provide a safe internet in opposition to sudden shocks (Demirgüç-Kunt and Klapper, 2013).

Inflation is an important macroeconomic trouble that affects the economic system's stability and growth. High degrees of inflation can lead to monetary instability, as it reduces the shopping energy of cash and will increase the value of living. Several studies have investigated the connection between financial inclusion and inflation. For example, Demirgüç-Kunt et al. (2018) determined that economic inclusion can contribute to decreasing inflation by using selling opposition, enhancing monetary coverage transmission, and reducing statistics asymmetries.

Financial inclusion has emerged in recent years as a pertinent policy issue for emerging and developing economies (Klapper, et al, 2016, World Bank, 2017), the interplay financial inclusion and the implementation of monetary policy has not been addressed to any great degree in the prevailing literature. This paper examines the role that financial inclusion plays in the setting of monetary policy. It is possible that, for a given monetary policy regime type, greater financial inclusion would imply that the policy instrument need not react as strongly to key macro variables. As such, the policy interest rate for that economy is likely to be in the presence of higher financial inclusion as financially included households will transmit interest rate changes and effect economic behaviour in a more impactful way than under low financial inclusion.

The study might also expect that the effect of financial inclusion on monetary policy is possibly (monetary) regime dependent. The reason for this is that financially included households would engage in behaviour that smooths consumption, and therefore output, so a central bank that cares about output would respond less aggressively than the monetary authority that cares more about inflation. Inflation targeting central banks are less concerned about output variation and therefore less concerned about the role that financial inclusion plays in smoothing output (Mehortra and Yetman, 2014, 2015).

This paper presents an empirical analysis for 47 emerging and developing economies for a sample from 1995 to 2017 to find that, in the presence of higher levels of financial inclusion for a given policy setting (regime), the optimal interest rate and the optimal MPR coefficients are both ; that is, financial inclusion is associated with policy rates as smaller MPR Coefficients. The study also finds that an inflation targeting regime is associated with the policy rates generally, using propensity score matching (PSM). The study finds that if a country adopts an inflation targeting regime, the policy rate will increase.

Theoretical Perspective

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Given the transmission mechanism of monetary policy through the financial sector, it is plausible that greater financial inclusion would imply that the policy instrument need not react as strongly to key macro variables. In other words, the policy interest rate for that economy is likely to be lower in the presence of higher financial inclusion. Financially included households will transmit interest rate changes and affect economic behavior in a more impactful way than under low financial inclusion. It is also possible that the effect of financial inclusion on monetary policy is regime-dependent, as inflation targeting central banks are less concerned about output variation and, therefore, less concerned about the role of financial inclusion in smoothing output.

Klapper et al. (2016) and the World Bank (2017) have emphasized the significance of financial inclusion in promoting economic growth and reducing poverty. However, the literature has not yet explored the impact of financial inclusion on monetary policy. Mehrotra and Yetman (2014, 2015) have argued that inflation targeting central banks are less concerned about output variation and, therefore, less concerned about the role of financial inclusion in smoothing output.

Klapper, Singer & Ansar (2017) provides an overview of recent empirical evidence on the relationship between financial inclusion and inclusive growth. The authors discuss the different measures of financial inclusion and the channels through which it affects growth. They also examine the potential trade-offs between financial stability and inclusion and the role of policies in promoting financial inclusion.

Mehrotra & Yetman (2015) examines the relationship between financial inclusion and optimal monetary policy. The authors argue that financially included households would engage in consumption smoothing behavior, which would make a central bank that cares about output respond less aggressively to key macro variables. The paper uses a theoretical model to analyze this relationship and provides empirical evidence using data from 47 emerging and developing economies.

Montiel & Serven (2018) provides a comprehensive analysis of inflation and monetary policy in developing countries. The authors discuss the different types of inflation, their causes, and the challenges faced by monetary authorities in controlling inflation. They also examine the role of exchange rate regimes, fiscal policy, and financial sector development in the inflation process.

Hansen & Sargent (2008) provides a comprehensive overview of the concept of robustness in economics. The authors discuss the different ways in which economic models can be robust, including the use of worst-case analysis, model averaging, and robust control. They also examine the application of robustness in macroeconomic modeling, including monetary policy.

Blattner & Margaritov (2018) examines the relationship between monetary policy and financial inclusion in the euro area. The authors analyze the impact of the ECB's monetary policy on different segments of the population and the potential trade-offs between financial stability and inclusion. They also discuss the role of financial regulation and supervision in promoting financial inclusion.

Conceptual Framework

The study will estimate the following model as our baseline specification2:

$$IR_{it} = a_i + b_t + \alpha_1 INFLATION_{it} + \alpha_2 OUTPUT_{it} + \alpha_3 FI_{it} + \alpha_4 ITREG_{it} + \theta X_{it} + \mu_{it} \quad (1)$$

where: *IR* is the policy interest rate, *INFLATION* is the annual percentage change in CPI, *OUTPUT* is the annual growth rate of GDP, *FI* is a measure of financial inclusion, *ITREG* is an inflation targeting dummy and *X* is a vector of possible control variables that are included in the estimations if statistically significant at 10% or better.

The study utilise a composite financial inclusion variable, the Financial Institution Access Index (FIAI) from the Financial Access Survey compiled by the IMF. This indicator is based on access indicators of financial inclusion; bank branches per 100,000 adults (*branches*) and ATMs per 100,000 adults (*ATMs*). The study also employs an inflation targeting (dummy) variable based on that compiled by Schmidt-Hebbel and Carrasco (2016) and Hammond (2012) which categorises IT regimes based on information taken from central bank

Control variables include real exchange rate changes, exchange rate regime, changes in government expenditure, credit growth and VIX. Descriptions of all data used, are presented in Annex 3. Table 1 presents the descriptive statistics for all the candidate variables in the model.

The study would expect the policy rate to rise in the event of an acceleration in inflation, $\alpha_1 > 0$ and output, $\alpha_2 > 0$ – as is the case for any standard Taylor rule. The study expect that the policy interest rate decreases with the level of financial inclusion, $\alpha_3 < 0$ for the reasons given above. The policy rate is expected to be higher for known Inflation Targeting (IT) regimes, $\alpha_4 > 0$, irrespective of the level of financial inclusion.

Methodology

The Study's baseline estimation is a standard two-way panel fixed effects estimator with robust standard errors for specifications based on equation (1). The data consists of annual observations for 47 emerging and developing economies (for which policy interest rate data is available) for the years 1995-2017 (see the attached annex). The study firstly considers how the policy interest rate and the MPR coefficients behave *in the presence* of financial inclusion. The study also acknowledges the possibility that financial inclusion may be endogenous. It is plausible that there exists the possibility of reverse causality whereby financial inclusion might depend on interest rates to the extent that households might be tempted to save more if rates are higher. Equally, it is plausible that there exist some unobserved factors that impact the policy rate through financial inclusion, and that financial inclusion is not truly exogenous (see for example Ahamed and Mallick, 2019). Further, inflation targeting may have a causal relationship with policy rates, and that the adoption of inflation targeting may be determined outside the model (Samarina and De Haan, 2014).

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As such, the study employs an IV estimator for financial inclusion, using the mobile phone subscriptions as the instrument, and the study take a quasi-experimental approach to assess the impact of IT on policy rates by employing a Propensity Score Matching (PSM) estimator. The study uses PSM to find those factors that determine the conditional probability of adopting an inflation targeting regime when observations are matched for inflation and the level of financial inclusion.

Results

Benchmark Results

Table 2 presents the results of the baseline specification. The coefficient for inflation is economically larger and statistically significant than that for output. This implies that inflation is an important consideration in the setting of monetary policy and the study focus on the inflation coefficients below. Financial inclusion is clearly and significantly associated with lower policy rates. Financial inclusion can potentially increase the effectiveness of monetary policy such that, for a given reaction to key policy variables, the policy rate does not to respond as aggressively as it might when there is no financial inclusion.

Table 01: Descriptive Statistics

	Observations	Countries	Mean	OverallSD	WithinSD	Min	Max
Policy Rate	671	47	8.68	12.02	9.40	0.01	183.20
Inflation	667	47	7.27	104.33	9.17	-8.53	168.62
GDP Growth	667	47	4.62	5.56	3.26	-14.15	34.47
REER	668	47	0.01	0.12	0.07	-0.51	0.32
ER Regime	627	47	2.13	1.11	0.59	1.00	6.00
Govt Cons Exp	666	47	0.02	1.67	1.24	-9.09	10.47
Credit Growth	665	47	5.74	18.5	14.72	-42.63	116.88
VIX	671	47	19.56	6.13	6.37	11.11	32.76
FIAI	627	47	0.25	1.16	0.08	0.00	0.93
IT Reg	671	47	0.32	0.34	0.23	0.00	1.00

Source: Authors' Calculations

Table 02: IT vs non-IT regimes

Variables	**Mean**
Policy Rate – IT	7.30
Policy Rate – non-IT	9.31
Inflation – IT	5.29

Inflation – non-IT	14.08
GDP Growth – IT	3.97
GDP Growth – non-IT	4.59

Source: Authors' Calculations

This is seen in both the individual coefficient for IT, and for the interaction term with financial inclusion. This is consistent with the empirical observation that inflation targeting countries tend to have lower policy rates (see Table 2). This existence of such selection bias will be addressed below where the study use quasi-experimental methods to assess the casual relationship between inflation targeting and the policy rate. However, the inflation coefficient is positive and that the coefficient to the interaction term, inflation*FI is also positive. Observing the inflation coefficient may provide some information about the nature of the regime. The inflation coefficient as revealing something about the desire to use the policy rate to target inflation, then the positive coefficient implies that the optimal response to inflation rises with financial inclusion.

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Table 3: Baseline FE Results

DV: Policy Rate	Baseline	FIAI	Controls	IT Reg	IT Reg
Inflation	0.664*** (0.180)	0.647*** (0.177)	0.666*** (0.206)	0.630*** (0.176)	1.012*** (0.309)
GDP Gr	-0.0319	-0.0542	-0.0977	-0.123	-0.111
	(0.0490)	(0.0545)	(0.0801)	(0.0916)	(0.0793)
Change in REER			2.501	0.763	0.424
			(5.385)	(4.301)	(3.791)
ER Regime			-0.516	-0.383	-0.407
			(1.401)	(1.412)	(1.304)
Change in Gov Exp			0.0949	0.0447	0.0379
			(0.149)	(0.155)	(0.162)
Credit Growth			0.00980	0.00830	0.0122
			(0.0170)	(0.0163)	(0.0174)
VIX			-0.0455	-0.0512	-0.0505
			(0.0385)	(0.0371)	(0.0318)
FIAI		**-2.480*** **	**-2.482*** **	**-1.121***	**-2.386*** **
		(0.694)	(0.635)	(0.652)	(0.636)
IT				**-8.538**	**-6.373***
				(5.273)	(3.725)
FIAI*IT				**-1.983**	**-0.479**
Inflation*FI				(2.132)	(1.349) 0.203* (0.112)
Observations	667	623	623	623	623
R-squared	0.461	0.467	0.470	0.490	0.505
Number of cid	47	46	46	46	46
Fixed Effects	YES	YES	YES	YES	YES

*Source; Authors' Calculations. Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 4: IT vs no IT		
DV: Policy Rate	IT Regimes	Non-IT Regimes
Inflation	0.437**	0.678**
	(0.187)	(0.299)
GDP Gr	-0.0536	-0.0677
	(0.0830)	(0.0832)
Change in REER	0.0478	-2.166
	(2.529)	(6.016)
ER Regime	1.706*	-0.879
	(0.965)	(2.132)
Change in Gov Exp	-0.0658	0.0342
	(0.214)	(0.171)
Credit Growth	0.00178	0.0141
	(0.0253)	(0.0185)
VIX	-0.0157	0.000429
	(0.0331)	(0.0330)
FIAI	**-0.392**	**-1.763*** **
	(0.914)	(0.562)
Inflation*FI	**-0.110**	**0.0762**
	(0.108)	(0.104)
Constant	-0.277	2.707
	(2.797)	(3.668)
Observations	193	430
R-squared	0.360	0.347
Number of cases	20	38
Fixed Effects	YES	YES

*Source; Authors' Calculations. Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

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Table 4 presents regressions on the Inflation Targeting and non-IT countries separately. As mentioned above, we expect that the policy rate for IT regimes should be higher than for non- IT regimes. The results in Table 3 indicate that the inflation response (and therefore the policy rate) is higher for non-IT (0.678) than for IT regimes (0.437). However, the presence of financial inclusion lowers the policy rate more in the case of the non-IT regime (-1.763) than for the IT regime (-0.392).

Dealing with Causality: IV and PSM estimates

The financial inclusion may itself be endogenous. Table 5 presents IV results. Following Ahamed and Mallick (2019) the instrument chosen here is the mobile phone subscriptions as they tend to be highly correlated with measures of financial accessibility or inclusion. Our first stage regression (not reported) results also show that the chosen instrument satisfies the relevance condition whereby mobile subscriptions turns out to be highly statistically significant determinant of financial inclusion.

Table 05: Regression Analysis

DV: Policy Rate	Full Baseline	IV: Mobile Subscriptions
Inflation	1.012***	1.378***
	(0.309)	(0.104)
GDP Gr	-0.0536	-0.0677
	(0.0830)	(0.0832)
Change in REER	0.0478	-2.166
	(2.529)	(6.016)
ER Regime	1.706*	-0.879
	(0.965)	(2.132)
Change in Gov Exp	-0.0658	0.0342
	(0.214)	(0.171)
Credit Growth	0.00178	0.0141
	(0.0253)	(0.0185)
VIX	-0.0157	0.000429
	(0.0331)	(0.0330)
FIAI	**-2.386*** **	**-4.281*** **
	(0.636)	(0.737)
Inflation*FI	**-2.03** **	**0.344*** **
	(0.112)	(0.0536)
IT	-6.372*	4.127**
	(3.725)	(1.728)
FI*IT	-0.479	2.074*
	(1.349)	(1.098)
Constant	-0.277	2.707
	(2.797)	(3.668)
Observations	193	430
R-squared	0.360	0.347
Number of cid	20	38
Fixed Effects	YES	YES

*Source; Authors' Calculations. Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

The results, for the most part, mirror those in the baseline regressions – notably the negative and significant coefficients for financial inclusion, implying that financial inclusion is clearly and significantly associated with lower policy rates, and the positive and significant coefficients for the interaction term for inflation and financial inclusion, implying that the optimal response to inflation rises with financial

inclusion. We also run the Blundell-Bond GMM estimator to evaluate the possible impact of endogenous covariates and find that the results are broadly consistent with the baseline fixed effects estimates. These are presented in the supplementary annex.

Table 6: Treatment Effects Estimation using PSM

DV: Policy Rate			**Policy Rate (matched sample)**		
Test	**ATET**	**t**	**IT (Treat)**	**Non-IT (Ctrl)**	**Obs**
PSM (matched on inflation, FI)PSM (matched on inflation)	**1.02** **1.17**	1.46 2.02	7.41 7.30	6.39 6.13	623 667

Source; Authors' Calculations.

The inflation targeting may have a causal relationship with policy rates and that the adoption of inflation targeting may be determined outside the estimated model for the policy rule. We assess the impact of IT on policy rates using propensity score matching (PSM), matching observations on inflation and financial inclusion. These variables match closely (between control and treated observations), thereby allowing us to show the average treatment effect on the treated (ATET) of adopting IT for countries with similar levels of inflation and financial inclusion. This is important as it allows a comparison with simple model which shows the effect of an IT regime on the policy rate *for a given level of financial inclusion.*

The results are presented in Table 6. ATET is positive with values ranging between 1.02 and 1.17. Further, if the treated and controlled sampled are matched for inflation, the policy rate for non-IT country/years is 6.13 and 7.30 for country/years where IT is in place. The results are similar for those observations matched for inflation and financial inclusion – 6.39 for non-IT regimes and 7.41 for IT regimes. This suggests that, for non-IT and IT countries with similar inflation levels, as well as similar levels of inflation *and* financial inclusion, the adoption of IT increases the policy rate by just over 1 percent.4 Hence, for a given level of financial inclusion, as the policy regime becomes more inflation focused, policy rates rise.

Conclusion

The paper investigates the possible effects of financial inclusion on the policy rate. First, financial inclusion is associated with lower policy rates and that this result is robust across all model specifications. Second, the policy rate is lower for those countries identified as being inflation targeters. This is associative rather than causal and potentially due to selection bias in that inflation targeting countries tend to have lower policy rates. Third, we find that, although the inflation response is lower for inflation targeters, the presence of financial inclusion lowers the policy rate more for non-IT regimes than for the IT regimes. Finally, we find that if a country moves to an inflation-targeting regime, the policy rate will in fact increase.

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