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Does lowering and narrowing the inflation target band enhance the effectiveness of monetary policy transmission? Evidence from South Africa

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ABSTRACT

The South African Reserve Bank has indicated since 2024 the urgency to lower the current inflation target (IT) band from 3-6% to a lower target point. This paper estimates the impact of various IT bands on the interest rate pass-through and the mark-up of repo rate changes to weighted lending rates in South Africa. It examines whether the interest rate pass-through to lending rates differs when inflation is within three ranges: (i) 0-3%, (ii) 3-6%, or (iii) above 6%. The findings suggest that the pass-through is higher and the mark-up is lower when inflation is between 0-3% compared to within the 3-6% band. Additionally, the paper explores the effects of narrowing the target band from 3-6% to 2-4%. Evidence indicates that narrowing the target band from 3-6% to 2-4% results in a higher interest rate pass-through to lending rates. These findings imply that the transmission of monetary policy is more effective when inflation is within the 2-4% range. Consequently, the SARB's adoption of a lower inflation target will enhance the transmission of policy rate changes to lending rates and reduce the mark-up.

Contribution/ Originality: This paper contributes by examining the influence of inflation environments 0–3 %, 3–6 %, and above 6 % on the transmission of monetary policy to lending rates in South Africa. The analysis investigates the effects of lowering and narrowing the target band from 3–6 % to 2–4 % on interest rate pass-through and mark-up.

1. INTRODUCTION

The South African Reserve Bank (SARB) adopted the inflation targeting (IT) regime in February 2000, with price stability maintained within an inflation target band of 3-6%. Since 2024, the SARB has advocated for a lower inflation target point of 3%, compared to the midpoint of 3-6%, which was implemented in July 2017. However, no studies examine the possible impact of lowering and narrowing the IT band relative to other inflation bands on the effectiveness of monetary policy transmission on lending rates. An effective monetary policy depends on the smooth transmission of policy rate changes to lending rates. When policy rate changes are passed rapidly to lending rates, the impact on demand and inflation is quicker. Conversely, if lending rates are rigid or slow to adjust, policy objectives become harder and slower to achieve (Becker, Osborn, & Yildirim, 2012; Mishkin, 1996). How would a lower inflation target impact the effectiveness of monetary policy in South Africa? Alternatively, does the lowering and narrowing of the inflation target band matter for the policy rate pass-through to lending rates in South Africa? This study adopts the approaches of Ndou and Gumata (2024) and Ndou (2022) to partition consumer prices into various inflation bands and determine whether the policy or interest rate pass-through to lending rates differs when inflation is within the

following ranges: (i) 0-3%, (ii) 3-6%, and (iii) above 6%. The analysis further examines the effects of narrowing the inflation target band from 3-6% to 2-4%.

The latter is consistent with the SARB's setting point target of 3%, which allows deviations of 1% above and below it.

The daily investor's online publication reported on 9 October 2025 that Kganyago spoke to South African lawmakers regarding the quest to lower the IT band.[1] He said.

> *"The central bank and National Treasury agreed that the country's inflation target should be lowered, but they were still discussing when to make the change".*

Prior to addressing the lawmakers, the Daily Investor[2] newspaper on 24 July 2024 wrote.

> *"South African Reserve Bank Governor Lesetja Kganyago wants to lower the country's inflation target to 3 %, which can significantly impact the economy and markets. Kganyago said in a statement that he wants to lower South Africa's target inflation rate from its current range of 3 to 6 % before 2025".*

On 12 November 2025, the National Treasury and the SARB issued a joint statement indicating that the inflation target will be set at 3%, with a tolerance range of 1% on each side. This approach provides flexibility to respond to unexpected shocks and maintain economic stability.[3] The reduction of the IT band may bring South African consumer price inflation closer to that of other emerging market and developing economies, as well as trading partners, and may also lower government borrowing costs. Table 1 lists some countries around the world that have adopted an inflation targeting framework regardless of their income level. Some of these countries are South Africa's trading partners, and there are also peers within the emerging and developing markets group. It is evident in Table 1 that most of these countries have tolerance bands around their inflation target points.

Table 1. Countries that adopted inflation targeting regardless of their income level.

Country	Date of adoption	Target point or target range (%)	Country	Date of adoption	Target point or target range (%)
New Zealand	1990	1-3	Philippines	2002	4 +/− 1
Canada	1991	2 +/− 1	Guatemala	2005	5 +/− 1
United Kingdom	1992	2	Indonesia	2005	5 +/− 1
Australia	1993	2 − 3	Romania	2005	3 +/− 1
Sweden	1993	2	Serbia	2006	4 − 8
Czech Republic	1997	3 +/− 1	Turkey	2006	5.5 +/−2
Israel	1997	2 +/− 1	Armenia	2006	4.5 +/−1.5
Poland	1998	2.5 +/− 1	Ghana	2007	8.5 +/−2
Brazil	1999	4.5 +/− 2	Uruguay	2007	3–7
Chile	1999	3 +/− 1	Albania	2009	3 +/− 1
Colombia	1999	2 − 4	Georgia	2009	3
South Africa	2000	3 − 6	Paraguay	2011	4.5
Thailand	2000	0.5 − 3	Uganda	2011	5
Hungary	2001	3 +/− 1	Dominican, Rep	2012	3–5
Mexico	2001	3 +/− 1	Japan	2013	2
Iceland	2001	2.5 +/− 1.5	Moldova	2013	3.5–6.5
South Korea	2001	3 +/− 1	India	2015	2-6
Norway	2001	2.5 +/− 1	Kazakhstan	2015	4
Peru	2002	2 +/− 1	Russia	2015	4

Source: Inflation Targeting: Holding the Line. https://www.imf.org/external/pubs/ft/fandd/basics/target.htm

The pronouncements by the SARB Governor on lowering the inflation target band have not been accompanied by research that considers the implications for the pricing behavior of banks and the bank lending channel. For

[1] https://dailyinvestor.com/finance/105105/big-inflation-change-coming-to-south-africa/#:~:text=Skip%20to%20content,least%2015%20minutes

[2] https://dailyinvestor.com/finance/58716/south-africas-plan-to-lower-inflation-target/

[3] 20251112O1 Announcement of the new inflation target for South Africa.pdf

instance, will a lower inflation target enhance or weaken the effectiveness of monetary policy transmission? In recent years, numerous global studies, such as Bagas, Purwono, and Rumayya (2023); Damane (2022); Awopegba, Afolabi, Adeoye, and Akpokodje (2022); Triwibowo, Oktaviani, Ginanjar, and Ardiansyah (2022) and Li, Si, and Ge (2021), have investigated the pass-through of monetary policy changes into bank lending rates to assess the effectiveness of monetary policy transmission. The analysis in this paper differs from these studies by examining the impact of the 3-6% inflation band relative to the 0-3% band, as well as when inflation exceeds 6%, on the pass-through of interest rates to lending rates in South Africa. Additionally, this study differs from previous research by analyzing the effects of narrowing the target band from 3-6% to 2-4%. This is consistent with the SARB setting a point target of 3 % that allows deviations of 1 % above and below it, like IT bands for many countries shown in Table 1.

The literature offers mixed evidence on how inflation affects the interest rate pass-through. Theoretically, Cottarelli and Kourelis (1994) and Leroy and Lucotte (2015) suggest that higher inflation leads to more frequent price adjustments, which in turn strengthen the pass-through of policy rate changes to lending rates. Leroy and Lucotte (2015) show that a 1 % unexpected rise in the money market rate triggers stronger bank rate responses in high-inflation economies. Perera and Wickramanayake (2016) also highlight inflation's role in retail rate adjustments. Similarly, Égert, Crespo-Cuaresma, and Reininger (2007) and earlier studies, which include Cottarelli and Kourelis (1994); Harald Sander and Kleimeier (2006), and Gigineishvili (2011), argue that high inflation promotes faster and more complete pass-through, as frequent price changes are more common in such environments.

Saborowski and Weber (2013) argue that inflation is not a key driver of interest rate pass-through, as differences between high-inflation and low-inflation environments were statistically insignificant. By contrast, Gigineishvili (2011) and Cottarelli and Kourelis (1994) find a stronger and faster pass-through in higher-inflation settings. Sander and Kleimeier (2004) also note that elevated inflation raises the speed of adjustment in later stages, boosting the long-run effect. More recently, Greenwood-Nimmo, Steenkamp, and Van Jaarsveld (2024) studied interest rate pass-through in South Africa but did not directly assess the role of inflation or changes in the IT band. Aziakpono and Wilson (2010) did not examine the role of inflation on interest rate pass-through in South Africa. In addition, Otero, Gómez-Ramírez, and Restrepo (2024) examined asymmetries in the interest rate channel in inflation-targeting Latin American countries but did not examine the role of inflation. Furthermore, Galindo and Steiner (2022) as well as Maravalle and González (2022) examined asymmetric interest rate transmission in Colombia and Mexico, but did not determine the role of inflation.

This study contributes to the literature by investigating whether the inflation environment influences the degree of interest rate pass-through and lending rate mark-ups in South Africa. Specifically, it examines how inflation regimes shape the central bank's transmission of policy rate changes to lending rates. The analysis is motivated by Gigineishvili (2011)'s view that enhancing the pass-through is key to achieving price and financial stability. Additionally, this analysis is driven by the mixed evidence in the literature, which remains inconclusive regarding whether inflation environments significantly affect the transmission mechanism of policy rate changes to lending rates. Furthermore, the study contributes to monetary policy discussions and addresses research gaps by evaluating whether inflation levels between 3–6%, 0–3%, and above 6% generate distinct, non-linear impacts on the interest rate pass-through to lending rates and mark-ups in South Africa. The analysis employs three techniques: a time-varying coefficient model, an inflation-regime-dependent model, and a model with the interaction of inflation bands and the policy rate, to assess the robustness of the findings. Unlike earlier studies in South Africa, this analysis considers the potential implications of a lower inflation target band, which has broader relevance for other inflation-targeting economies assessing adjustments to their frameworks by incorporating the nonlinear effects of inflation bands on the interest rate pass-through to lending rates. Lastly, the study examines the effects of lowering and narrowing the target band from 3–6% to 2–4%, a topic not previously explored in South Africa or other emerging market economies. This aligns with the South African Reserve Bank's (SARB) setting of a 3% inflation target, allowing deviations of 1% above and below it.

I find that the interest rate pass-through is stronger while the loan mark-ups are lower when inflation is between 0–3% compared to 3–6%. This suggests that policy rate changes are transmitted more quickly and effectively to lending rates in a low inflation environment, leading to faster effects on aggregate demand and inflation. Additionally, I find that narrowing the target band from 3–6% to 2–4% results in a higher interest rate pass-through to lending rates. These findings are robust across various models, including a time-varying coefficient model, an inflation-regime-dependent model, and a model with interaction between inflation bands and the policy rate. The policy implication is that a narrower, lower inflation target band enhances the effectiveness of monetary transmission to lending rates in South Africa.

This paper is organized as follows: Section 2 provides a theoretical review. Section 3 describes the methodology, while Section 4 discusses data dynamics and the Granger causality test. Section 5 presents the results and discusses the findings. Section 6 concludes the paper.

2. THEORETICAL MODEL

In an inflation-targeting regime, the central bank adjusts the policy rate to steer inflation toward the target. These changes influence banks' lending rates, which in turn shape real economic activity. The strength of monetary transmission depends on how quickly and fully policy rate changes pass through to banks' lending rates. To capture this process, the study applies (Rousseas, 1985)`s simple markup model of commercial bank lending rates given by Equation 1.

$$LR_t = \theta + \delta * R_t + u_t \quad (1)$$

Where LR_t is the lending rate, θ is a markup or markdown function? This reflects the market power of individual banks or the sector as a whole. In banking research, loan mark-ups, defined as the gap between lending rates and marginal costs, are widely used as a proxy for such power (De Loecker & Warzynski, 2012). Lending rates cover not only credit risk from potential defaults but also the costs of originating, administering and monitoring loans, with the mark-up capturing the margin above these costs. In Equation 1, R_t is the monetary policy rate or repo rate. In an imperfectly competitive banking market, lending rates typically include a persistent markup over funding costs. δ measures the degree of the pass-through from the policy rate changes to the lending rate (Rousseas, 1985).

The mark-up θ can comprise both constant θ_0 and time-varying components θ_t as indicated in Equation 2. This component allows for time variation in mark-ups driven by the banking structure, bank-specific factors, and macro-financial conditions. Inflation bands are included to capture inflation regime effects, consistent with nonlinear approaches showing that inflation environments shape economic dynamics.

$$LR_t = \theta_0 + \theta_t + \delta * R_t + u_t \quad (2)$$

Failing to account for the possible time-varying component of the spread, θ_t could bias the δ estimate. Synthesising the existing literature, θ_t is determined by macro-financial factors, such as bank competition and the credit risk premium. This paper incorporates inflation bands to capture the influence of different inflation environments. The approach draws on price stickiness theories, where firms adjust prices only when shifts in market conditions are significant enough to outweigh menu costs. State-dependent pricing suggests that price changes occur endogenously, triggered by large gaps between actual and optimal prices (Alvarez, Lippi, & Passadore, 2017; Alvarez & Hernando, 2004; Apel, Friberg, & Hallsten, 2001; Dhyne et al., 2006; Dias, Dias, & Neves, 2004; Fabiani, Gattulli, & Sabbatini, 2004; Gagnon, 2009). In time-dependent pricing models, price changes occur at predetermined intervals, independent of economic conditions. Inflation mainly affects how often these revisions happen, with higher inflation leading to shorter intervals and more frequent adjustments. Empirical studies, including Gigineishvili (2011); Leroy and Lucotte (2015); Cottarelli and Kourelis (1994); Kleimeier and Sander (2006); Sorensen and Werner (2006), and Mojon (2000), find that higher inflation tends to strengthen the interest rate pass-through.

3. METHODOLOGY

The study estimates the interest rate pass-through to lending rates using a two-step Engle and Granger cointegration approach. In the first step, the Engle and Granger cointegration methodology involves estimating the long-run equilibrium in Equation 3 using the ordinary least squares approach.

$$LR_t = \theta + \delta * R_t + \rho * REC_t + u_t \quad (3)$$

In Equation 3, u_t is a disturbance term measuring the deviations of the lending rate from its equilibrium path. θ measures the loan intermediation mark-up or mark-down in the lending rate to reflect market conditions. δ captures the fraction of the change in the policy rate (R_t) reflected in changes in the lending rate (LR_t) over the long run. In fact, δ measures the magnitude of the policy rate pass-through in the long run. When δ is close to zero, this implies the monetary policy transmission mechanism is weak. In fact, an incomplete pass-through happens when δ is less than one. An incomplete pass-through suggests that banks may hold market power, influenced by switching costs, information asymmetries, and conditions that enable monopoly power or administered pricing (Niggle, 1987). By contrast, the pass-through is complete when δ takes the value one. There is over pass-through as articulated by De Bondt (2005), which occurs when δ exceeds one. Overpass-through arises from asymmetric information, where banks raise lending rates by more than policy rate hikes to offset repayment risks and lower creditworthiness. REC_t refers to the recession dummy, which equals one from 2009M1 to 2009M9 and zero otherwise. The dummy captures periods of economic instability, volatile and weak economic growth, heightened economic policy and political uncertainty, and periods of credit rating downgrades. In the second step, the Engle-Granger cointegration approach requires that the residuals u_t in Equation 3 be stationary and this is tested using the Dickey-Fuller unit root test. The coefficient γ on the lagged residual u_{t-1} is expected to be negative, significant, and bounded between 0 and -1 if there is a cointegrated relationship. The coefficient γ captures the speed of correction after disequilibrium.

$$\Delta LR_t = \theta + \gamma u_{t-1} + \delta * \Delta R_t + \rho * REC_t + e_t \quad (4)$$

To test for the role of different inflation bands on the pass-through of the policy rate shocks to the lending rate, the study estimates Equation 5, where θ_3 and θ_4 capture the differential effects of the policy rate on lending rates based on inflation bands. The inflation bands are captured by dummy variables π_{03} , π_{36} and π_{ab6}. In this case, π_{03} is a dummy variable that is equal to one when inflation is between 0-3 %, and zero otherwise; and π_{36} is a dummy variable that is equal to one when inflation is between 3-6 % and zero otherwise; and π_{ab6} is the dummy variable that is equal to one when inflation is above 6 % and zero otherwise.

$$LR_t = \theta_0 + \theta_1 * R_t + \theta_3 * R_t * \pi_{03} + \theta_4 * R_t * \pi_{36} + \rho * REC_t + u_t \quad (5)$$

I further evaluate the effects of the inflation target bands on the mark-up, by estimating Equation 6, which includes the inflation target dummies to capture their effects on mark-ups captured by coefficients ϑ_1 and ϑ_2 .

$$LR_t = \vartheta_0 + \vartheta_1 * \pi_{03} + \vartheta_2 * \pi_{36} + \theta_1 * R_t + \theta_3 * R_t * \pi_{03} + \theta_4 * R_t * \pi_{36} + \rho * REC_t + u_t \quad (6)$$

3.1. Robustness Testing

3.1.1. Inflation Regime-Dependent Regression Models

The study estimates three variants of Equation 4 for each of three inflation bands, as shown in Equations 7 to 8, to test the robustness of the results from the preceding section. This is achieved through separating the estimations into inflation between 0-3 %, 3-6 % and above 6 % IT bands, respectively. The inflation regime-dependent model is estimated to determine if the mark-up and the pass-through also vary with inflation regimes. π_t in the constraints in each of Equations 7 to 8 denotes the inflation rate.

$$LR_t = \theta + \delta * R_t + \rho * REC_t + u_t \,, \quad for\ 0 < \pi_t < 3\ percent \quad (7)$$

$$LR_t = \theta + \delta * R_t + \rho * REC_t + u_t \,, \quad for\ 3 \leq \pi_t \leq 6\ percent \quad (8)$$

$$LR_t = \theta + \delta * R_t + \rho * REC_t + u_t \,, \quad for\ \pi_t > 6\ percent \quad (9)$$

3.1.2. Time-Varying Pass-Through and Mark-Ups Based on the State Space Approach

The preceding section focuses on the static and regime-dependent results, whilst this section performs further robustness checks through estimating a time-varying model. This will show the pass-through and mark-up varying in each specific time using Equation 10, following Ndou, Gumata, and Tshuma (2019). Equation 10 uses the state space approach to get the time-varying pass-through φ_{0t} and loan intermediation mark-up ω_{0t} coefficients. Hence, Equation 11 captures the time-varying mark-up whilst Equation 12 shows the time-varying interest rate pass-through to lending rates. The time-varying equation approach differs from rolling regressions, as the latter rely on arbitrarily chosen window lengths, making results sensitive to the selected period.

$$LR_t = \omega_{0t} + \varphi_{0t} * R_t + \delta_t * REC_t + \epsilon_t \quad (10)$$

$$\omega_{0t} = \omega_{0t-1} + \varepsilon_t \quad (11)$$

$$\varphi_{0t} = \varphi_{0t-1} + \varepsilon_t \quad (12)$$

The study determines the robustness of the inflation bands` impact on the time-varying interest rate pass-through using Equation 13, where $\rho_3$ , $\rho_4$ and $\rho_5$ capture the effects of different inflation bands on the interest rate pass-through. In addition, the analysis determines the robustness of the inflation bands` impact on the time-varying mark-ups using Equation 14, where τ_3 , τ_4 and τ_5 capture the effects of different inflation bands on the mark-ups.

$$\varphi_{0t} = \mu_0 + \rho * REC_t + \rho_1 * \pi_t + \rho_2 * REC * \pi_t + \rho_3 * \pi_{03} + \rho_4 * \pi_{36} + \rho_5 * \pi_{ab6} + u_t \quad (13)$$

$$\omega_{0t} = \tau_0 + \tau * REC_t + \tau_1 * \pi_t + \tau_2 * REC\_\pi_t + \tau_3 * \pi_{03} + \tau_4 * \pi_{36} + \tau_5 * \pi_{ab6} + u_t \quad (14)$$

All the model estimations use HAC standard errors.

4. DATA

This study uses monthly (M) data from January 2000 to July 2017. The analysis employs the policy rate, measured by the repo rate obtained from the Bank of International Settlements (BIS). The weighted lending rate is sourced from the South African Reserve Bank (SARB) database. The annual data is also considered for comprehensive analysis.

Headline consumer price inflation (hereafter referred to as inflation) is obtained from the BIS database. Figure 1 illustrates an elevated spread between the weighted lending rate and the repo rate following 2011, compared to the lower rate levels observed during 2004–2006. The magnitude of the spread between the repo rate and the lending rate during the tightening phase of 2014–2017 is lower than that observed during 2006–2008.

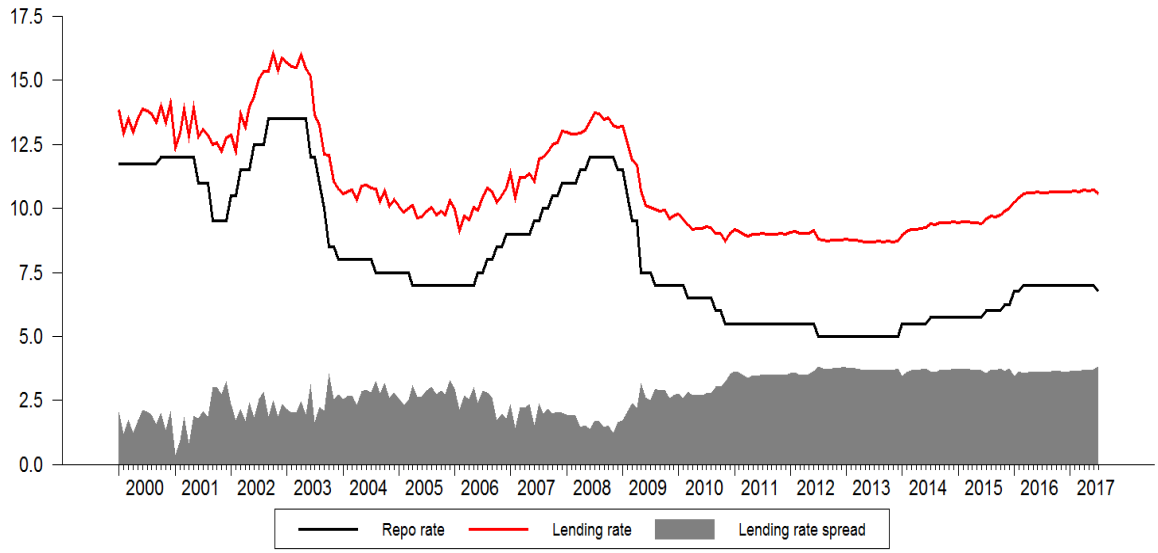

Figure 1. The weighted lending rate, repo rate in percent and their difference.

4.1. Unit Root Testing

The Engle and Granger cointegration approach requires the variables to be of the same integrated order, specifically order one. The study employs the Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root tests to determine the order of integration of the repo rate and lending rate. The null hypothesis for these tests is that each variable has a unit root. The results, as shown in Table 2, reject the null hypothesis, indicating that both series are non-stationary in levels and become stationary after first differencing. This suggests that the repo rate and lending rate are integrated of order one.

Table 2. Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root tests.

	ADF			Phillip Perron		
	Constant	Constant & trend	None	Constant	Constant &trend	None
Lending rate	-2.037	-2.454	-0.667	-2.025	-2.189	-0.838
Dlending_rate	-5.767*	-5.765*	-5.771*	-18.613*	-18.599*	-18.633*
Repo rate	-2.483	-3.449	-1.178	-1.823	-2.215	-1.142
Drepo_rate	-4.207*	-4.209*	-4.191*	-13.905*	-13.898*	-13.900*

Note: * Denotes significance at 5% significance level. Dlending_rate denotes differenced lending rate over one period. Drepo_rate denotes the differenced repo rate over one period.

5. RESULTS

5.1. Determining the Existence of Cointegration Relationship

Table 3 show the results for testing for existence of cointegration relationship between the repo rate and lending rate using the Johansen cointegration approach. As shown in Table 3, both the trace and max statistics from Johansen cointegration test confirm a single cointegrating relationship.

Table 3. Johansen likelihood-based analysis of cointegration.

Roots	Rank	Eigen Value	Lambda-max	Trace	Trace-95%
2	0	0.2039	47.8831	49.8625	15.34
1	1	0.0094	1.9794	1.9794	3.84

Note: Unrestricted eigenvalues, -T log(1-lambda) and Trace Test.

Table 4 reports the estimates of the long-run relationship in Equation 4. The long-run markup is 4.946%, and the pass-through is 73.495%. The coefficients are statistically significant. The pass-through magnitude of less than one indicates an incomplete pass-through. The negative value of *REC* indicates that the lending rate during the recession in 2009 declined but insignificantly.

Table 4. Long-run relationship based on Equation 4.

Variable	Coefficient	Std Error	T-Stat	P-value
Constant	4.9460	0.0978	50.5641	0.000
Repo rate	0.7395	0.0114	64.7248	0.000
REC	-0.1883	0.1462	-1.2878	0.199
R^2	0.9527			
$RBar^2$	0.9523			

Note: The dependent variable is lending rate.

The analysis further tests the presence of a cointegration relationship between the repo rate and the lending rate using the Engle-Granger method, which assesses the stationarity of the residuals in Equation 3. If the residuals are non-stationary, this indicates the absence of cointegration. In Table 5, the null hypothesis of no cointegration (i.e., a unit root in residuals) is rejected across three model assumptions. This suggests that a cointegrated relationship exists between the repo rate and the lending rate.

Table 5. Engle-Granger Cointegration Test Under Three Assumptions

	Constant	Constant and trend	None
Test statistics	-3.6912	-8.3426	-3.6312
Test critical values			
1%	-3.95094	-4.40097***	-3.39***
5%	-3.36632**	-3.82589**	-2.76**
10%	-3.06571*	-3.53013*	-2.45*

Note: *denotes significance at 10%. ** denotes significance at 5%, *** denotes significance at 1%.

Both the Johansen cointegration and Engle-Granger cointegration approaches confirm the existence of a cointegrated long-run relationship between repo rate and lending rate. This permits the study to estimate the long equation and the short-run error correction model given by Equation 4. In Table 6, the error correction term is negative and statistically significant. This is further evidence of cointegration between the repo rate and the lending rate, based on the Engle-Granger cointegration test.

Table 6. Error correction model.

Variable	Coefficient	Std. error	T-stat	P-value
Constant	-0.0055	0.0233	-0.2377	0.8124
Ect_{t-1}	-0.3977	0.0548	-7.2539	0.0000
$Drepo_t$	0.4703	0.0672	7.0020	0.0000
R^2	0.3113			
$RBar^2$	0.3046			

Note: The dependent variable is change in lending rate (Dlend). Drepo denotes changes in repo rate. The standard errors based are HAC standard errors.

5.2. Examining The Impact of Inflation on the Long-Run Interest Rate Pass-Through and Mark-Up

The study further examines the impact of inflation on the long-term interest rate pass-through and mark-up. It investigates whether inflation regimes influence the magnitudes of mark-ups and the interest rate pass-through to lending rates. This section discusses the results derived from Equations 5 and 6 and their modified versions. Table 7 presents the results from various model specifications of these equations, assessing the robustness of the findings. Column 3 highlights the effect of inflation bands on the size of policy rate pass-through into lending rates. On average, a 1 percentage point increase in the repo rate results in a 0.734 percentage point rise in the lending rate. This partial pass-through aligns with the postulation of Stiglitz and Weiss (1981), who argued that higher rates may drive out safer borrowers and attract riskier ones, leading to adverse selection and moral hazard. These dynamics can discourage banks from raising rates further, resulting in upward stickiness in lending rates. While De Bondt (2005) suggested that banks might inflate risk premiums by overstating pass-through, our results do not support this view. The pass-through coefficients are slightly lower in the 0–3% inflation band compared to the 3–6% band, indicating stronger transmission when inflation is low. This finding remains consistent even when excluding the recession dummy in column 2.

The estimations in Column 4 in Table 7 show that lending mark-ups are higher in the 3–6 % compared to the 0–3 % band. This confirms the prevalence of lower mark-ups in a low inflation environment. This result holds in Column 5, even when accounting for interactions between the recession dummy and the repo rate. These findings indicate that both interest rate pass-through and mark-up coefficients vary across inflation cycles, as captured by various bands. Additionally, the findings highlight that different inflation environments influence the transmission of policy rate changes to lending rates. This suggests that the transmission of the South African Reserve Bank's (SARB) policy decisions is more effective when inflation is below the current 3–6% target band compared to when it is within this target range.

Table 7. Impact of Inflation on Pass-Through and Mark-Up

Variable	Variant of Equation 5		Equation 5		Equation 6		Variant of Equation 6	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Constant	5.111	0.00	5.168	0.00	4.970	0.00	4.969	0.00
REC			-0.369	0.01	-0.330	0.00	-0.292	0.31
π_{03}_dummy					-0.070	0.24	-0.070	0.25
π_{36}_dummy					0.101	0.00	0.101	0.00
Repo rate	0.736	0.00	0.734	0.00	0.754	0.00	0.754	0.00
REC*reporate							-0.005	0.88
Reporate*π_{03}_dummy	-0.034	0.02	-0.039	0.00	-0.022	0.15	-0.022	0.15
Reporate*π_{36}_dummy	-0.035	0.00	-0.042	0.00	-0.104	0.00	-0.104	0.00
R^2	0.953		0.955		0.958		0.958	
Adjusted R^2	0.953		0.954		0.956		0.956	
Markup (MK)								
MK within 0-3 % IT band					4.900		4.899	
MK within 3-6 % IT band					5.070		5.070	
Pass-through (PT)								
PT within 0-3 % IT band	0.702		0.694		0.732		0.732	
PT within 3-6 % IT band	0.701		0.692		0.650		0.650	

Note: The dependent variable is the weighted lending rate.

5.3. Evidence From the Inflation Dependent Regression Models

The study further examines the differential effects of inflation on interest rate pass-through and mark-ups through estimating the inflation dependent regression Equations 7 to 9. The results in Table 8 from Equations 7 to 9 show that the pass-through is above 70 % and the mark-up is above 4.4 %. The R^2 value indicates that the repo rate explains 94.7% of the lending rate when inflation exceeds 6%, which is higher than the 89.1% observed in the low inflation regime of 0-3% band.

Table 8. Results from Equations 7 to 9.

Variable	Inflation within 0 to 3 % band		Inflation within 3 to 6 % band		Inflation above 6 %		Inflation within 2 to 4 %	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Constant	4.679	0.001	5.156	0.0001	4.986	0.000	4.799	0.000
Repo rate	0.754	0.002	0.703	0.000	0.742	0.000	0.725	0.000
R^2	0.891		0.934		0.947		0.943	
Adjusted R^2	0.885		0.933		0.946		0.941	
No observations	19		102		90		31	

Note: The dependent variable is lending rate.

Figure 2 shows the sizes of interest rate pass-through and mark-ups across three inflation bands. In Figure 2 (a), the highest interest rate pass-through happens when inflation is within the 0–3 % band compared to the 3–6 % band, followed by when inflation is above 6 % band. This is further evidence suggesting that a lower inflation band enhances the monetary policy transmission. By contrast, Figure 2 (b) shows lower loan mark-ups when inflation is within the 0–3 % band than in higher inflation regimes. Therefore, there is a lower lending risk premium when inflation is within the 0-3% band. These findings support the earlier conclusion from the model with an interaction between the repo rate and inflation bands, thus confirming the robustness of the conclusions.

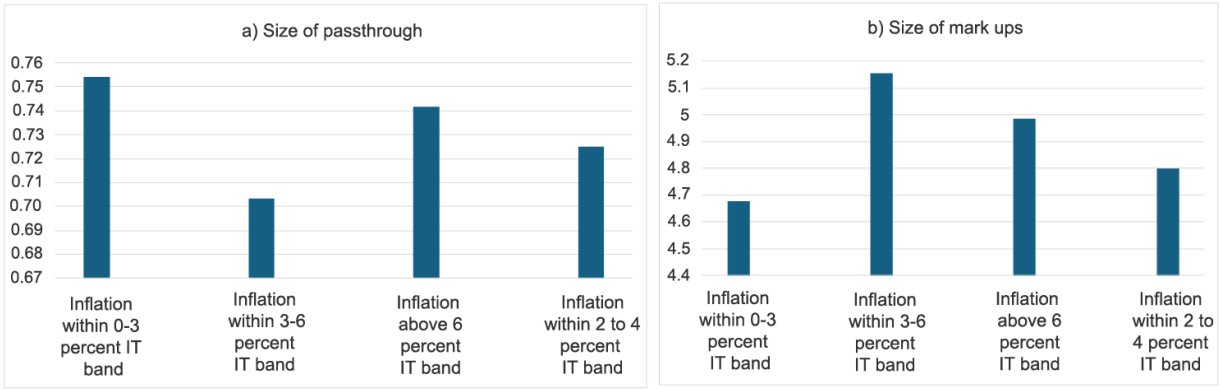

Figure 2. Comparison of the pass-through and mark-ups according to inflation bands.

The study further estimates short-run error-correction equations for each inflation band to examine whether there are differences in the speeds of adjustment toward equilibrium. In Table 9, the speed of adjustment is faster when inflation is within the 0–3% band, which is twice that observed in the 3–6% band and above 6%. Thus, approximately 87.9% of lending rate disequilibrium is cleared per month when inflation is within the 0–3% band. Additionally, the study examines the effects of narrowing the target band from 3–6% to 2–4%, and compares the impacts of the narrower band to those of other inflation bands. This approach aligns with the South African Reserve Bank (SARB) setting a point target of 3%, allowing deviations of 1% above and below, similar to inflation target bands used in many countries, as shown in Table 1. In the last column of Table 9, the disequilibrium in the lending rate is eliminated at a rate of 84.6% per month when inflation is within the 2–4% band, which exceeds the speed of adjustment observed when inflation is above 6%. This evidence suggests that lending rate disequilibrium is cleared much more quickly in low-inflation environments than in high-inflation environments.

Table 9. Error correction model and inflation bands.

Variable	Full sample		Inflation within 0 to 3% band		Inflation within 3 to 6% band		Inflation above 6%		Inflation within 2 to 4 % band	
	Coefficient	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**
Constant	-0.006	0.812	-0.264	0.000	-0.029	0.304	0.047	0.232	-0.230	0.013
ect_{t-1}	-0.398	0.000	-0.879	0.000	-0.381	0.000	-0.39	0.000	-0.846	0.000
Drepo	0.470	0.000	0.056	0.604	0.429	0.000	0.543	0.000	0.682	0.000
R^2	0.311		0.553		0.285		0.362		0.540	
AdjustedR^2	0.305		0.493		0.271		0.347		0.506	
No of Obs.	210		18		102		90		30	

Notes: The dependent variable is the change in the lending rate (Dlend). Drepo denotes changes in the repo rate.

5.3.1. Does the 4.5 % Inflation Point Matter?

The study evaluates the relevance of the midpoint of the current 3-6% IT band by estimating a short-run equation based on the 0-4.5% IT band and the above-4.5% IT band, and compares the results with those when inflation is within the 2-4% IT band. Additionally, the study examines the effects of narrowing the target band from 3-6% to 2-4%. This approach aligns with the SARB setting a point target of 3%, allowing deviations of 1% above and below it, as shown in the IT bands for many countries in Table 1. In Table 10, the lending rate adjustment is fastest when inflation is within the 2–4% band compared to when inflation is within the 0–4.5% IT band and above 4.5% IT band. Therefore, 84.6% of lending rate disequilibrium is eliminated within one month when inflation is within the 2-4% band, which is higher than 68.2% and 37.3% when inflation is within the 0-4.5% IT band and above 4.5%, respectively. This evidence confirms that lending rates revert to equilibrium faster when inflation is within 2-4% than when it is outside this band.

Table 10. Error Correction Model and the Role of the 4.5% Threshold

Variable	Inflation within 2 to 4% band		Inflation within 0 to 4.5% band		Inflation above 4.5% band	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Constant	-0.230	0.013	-0.167	0.001	0.022	0.415
ect_{t-1}	-0.846	0.000	-0.682	0.000	-0.373	0.000
Drepo	0.682	0.000	0.284	0.038	0.497	0.000
R^2	0.540		0.439		0.315	
AdjustedR^2	0.506		0.415		0.306	
No obs	30		50		159	

Notes: The dependent variable is the change in lending rate (Dlend). Drepo denotes changes in repo rate.

The study further examines the interest rate pass-through within the 3-6% band. Table 11 shows the results examining the role of the midpoint of the 3–6% IT band. The target band is divided into two ranges: 3–4.5% and 4.5–6%. In Table 11, the long-term policy rate pass-through is higher when inflation is within the 3–4.5% band compared to above 4.5%. This evidence indicates that the interest rate pass-through to the lending rate is more pronounced when inflation is within the 3–4.5% band than when it exceeds this band.

Table 11. Long-run model and the role of the 4.5 % threshold.

Variable	Inflation 3 to 4.5 % band		Inflation 4.5 to 6 % band	
	Coefficient	P-value	Coefficient	P-value
Constant	4.507	0.000	5.309	0.000
Repo rate	0.779	0.000	0.689	0.000
R^2	0.920		0.945	
$RBar^2$	0.918		0.944	
No of observations	33		69	

Note: The dependent variable is lending rate.

Table 12 reports the error correction model results within the 3–4.5 % and 4.5–6 % bands. The speed of adjustment is faster in the 3–4.5% band (56.1%) than in the 4.5–6% band (33.3%). This evidence indicates a quicker correction of disequilibrium in the 3-4.5% band. Additionally, the study examines the effects of narrowing the target band from 3-6% to 2-4%. Column 4 in Table 12 shows that the speed of lending rate adjustment when inflation is within the 2–4% band is much faster than when it is within the 3–4.5% band. This evidence suggests that lower inflation within a 2-4% band enhances monetary policy transmission in South Africa.

Table 12. Error correction model and the role of the 4.5% threshold.

Variable	Inflation 3 to 4.5 % band		Inflation 4.5 to 6 % band		Inflation 2 to 4 % band	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Constant	-0.105	0.092	-0.008	0.793	-0.230	0.013
ect_{t-1}	-0.561	0.000	-0.332	0.048	-0.846	0.000
Drepo	0.467	0.013	0.334	0.003	0.682	0.000
R^2	0.449		0.207		0.540	
Adjusted R^2	0.412		0.183		0.506	
No observations	33		69		30	

Note: The dependent variable is the change in lending rate (Dlend).

5.4. Time-Varying Pass-Through and Markups

Figure 3 displays the time-varying estimates of the interest rate pass-through and the loan mark-ups for the whole sample, estimated using Equations 8 to 10. In Figure 3, a high interest rate pass-through occurred during the 2003-2007 period, but was lower during the 2007-2009 period and declined further in 2009-2013. The policy rate pass-through rose during 2014-2017M6 coinciding with the interest rate tightening cycle.

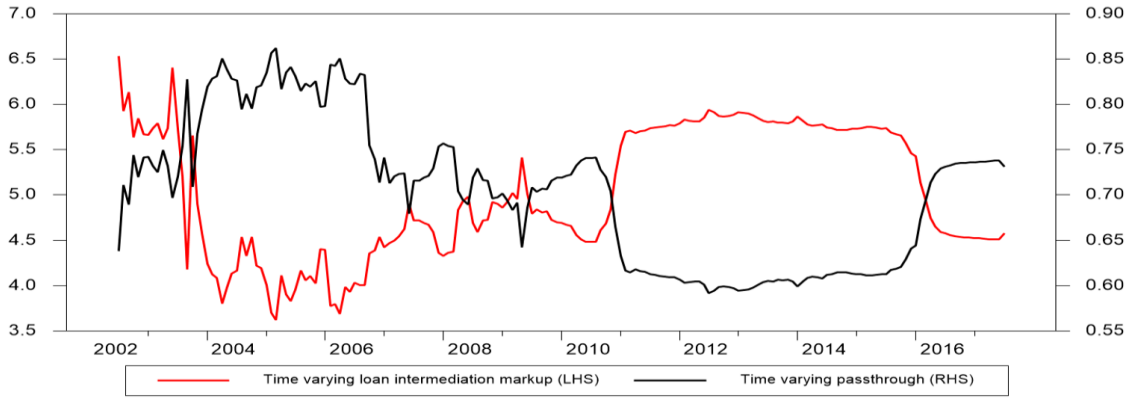

Figure 3. Estimated time-varying policy rate pass-through and mark-up.

In addition, Figure 3 shows that mark-ups move inversely to the interest rate pass-through, reflecting changes in bank pricing across inflation cycles as in Ndou et al. (2019). Before 2009, the interest rate pass-through was higher, and mark-ups were lower, whereas after 2009 the opposite was true. This inverse relationship suggests that higher mark-ups are linked to a weaker pass-through. The post-2009 decline in the interest rate pass-through likely reflects higher risk premiums amid low demand, weak growth, and instability. Figure 4 further illustrates that lending spreads rose while policy rate pass-through fell after 2009, pointing to shifts in banks' pricing strategies.

Figure 4. Lending rate and policy rate spread, and the time-varying pass-through.

5.4.1. The Impact of Inflation on the Pass-Through and Mark-Up

Figure 5 plots trends of inflation, time-varying interest rate pass-through and mark-ups. In Figure 5 (b), the scatterplot shows a negative relationship. This suggests that higher inflation reduces the interest rate pass-through to the lending rate. Additionally, Figure 5(d) displays a scatterplot illustrating a positive relationship: inflation increases *mark-ups*, indicating that inflation influences both pass-through and loan pricing.

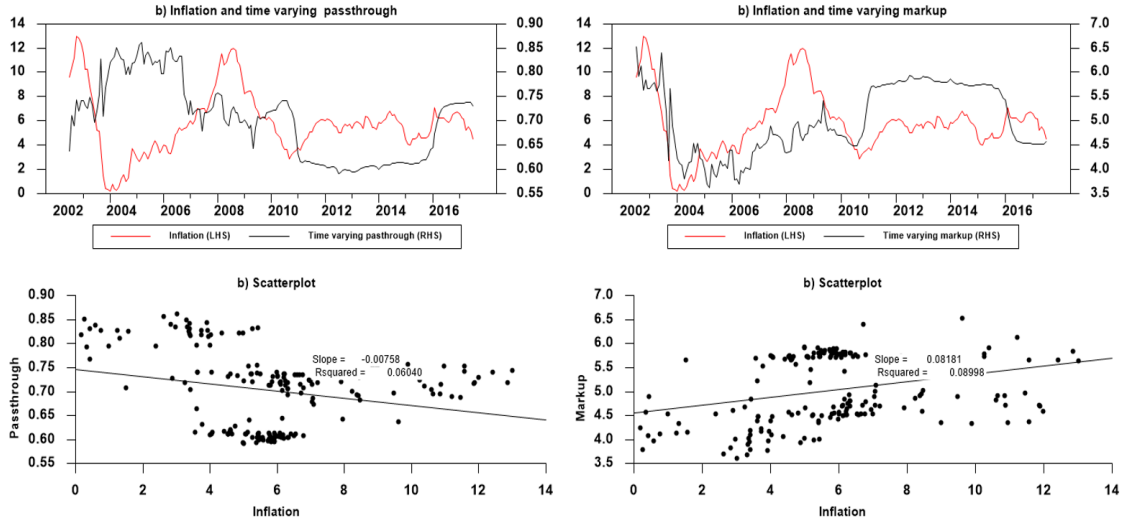

Figure 5. Plots of inflation, pass-through and mark-up.

Table 13, columns (1) and (2) show coefficients of -0.24743 and -0.2535 for the impact of $\pi_{ab6_}$dummy, indicating that pass-through falls sharply when inflation is above 6 %. The fall in the pass-through is more than nine times the size when inflation is within the 0–3 % band. These findings suggest that high inflation significantly reduces the effectiveness of monetary policy transmission by limiting the pass-through of the policy rate to lending rates.

Table 13. Impact of inflation on the policy rate pass-through.

	Variant of Equation 11		Equation 11	
Variable	**Coefficient**	**P-value**	**Coefficient**	**P-value**
Constant	0.86449	0.00	0.8645	0.00
REC			0.1650	0.00
Inflation	0.01000	0.00	0.0107	0.00
REC*inflation	-0.00017	0.90	-0.0223	0.00
$\pi_{03_}$dummy	-0.03793	0.00	-0.0387	0.00
$\pi_{36_}$dummy	-0.04708	0.00	-0.0478	0.00
$\pi_{ab6_}$dummy	-0.24743	0.00	-0.2535	0.00
R^2	0.36578		0.3690	
Adjusted R^2	0.34701		0.3465	

Note: The dependent variable is the time-varying interest rate pass-through. The standard errors are HAC estimators.

The study concludes by examining the impact of various inflation bands on time-varying markups. Table 14 reports the effects of inflation and different inflation bands on time-varying markups using Equation 12. Column (3) excludes the recession dummy to assess the robustness of the results. The results show a negative overall impact of general inflation on markups. However, when inflation exceeds 6%, markups rise sharply. Specifically, the markup is 1.58993 when inflation is above 6%, which is more than six times higher than the markup of 0.2467 when inflation is within the 0–3% band. This indicates that banks charge higher markups in high-inflation regimes.

Table 14. Impact of Inflation on the Markup

Variable	Variant of Equation 12		Equation 12	
	Coefficient	P-value	Coefficient	P-value
Constant	3.8746	0.00	3.8746	0.00
REC			-1.3451	0.00
Inflation	-0.0533	0.08	-0.0592	0.06
REC*inflation	-0.0136	0.33	0.1668	0.00
π_{03}_dummy	0.2467	0.04	0.2527	0.03
π_{36}_dummy	0.3124	0.00	0.3184	0.00
π_{ab6}_dummy	1.5893	0.00	1.6387	0.00
R^2	0.2359		0.2389	
Adjusted R^2	0.2133		0.2117	

Note: Dependent variable is the time-varying mark-up.

6. CONCLUSION

This study examines how different inflation target bands of 0–3 %, 3–6 %, and above 6 % affect the pass-through of repo rate shocks to lending rates and loan mark-ups in South Africa. The findings indicate a stronger pass-through and lower mark-up within the 0–3 % band compared to the 3–6 % band. Additionally, the study investigates the effects of narrowing the target band from 3–6 % to 2–4 %. Evidence suggests that narrowing the band from 3–6 % to 2–4 % results in a higher interest rate pass-through, implying a faster transmission of policy changes to lending rates. This leads to quicker effects on demand and inflation when inflation is between 0–3 %. Overall, the results imply that a lower inflation target band enhances the effectiveness of monetary policy transmission to lending rates. The research primarily focuses on the pass-through of the policy or interest rate to the aggregated weighted lending rate. Future research will extend this analysis to examine the influence of various inflation bands on the pass-through of the policy rate to sectoral lending rates and assess whether these effects have changed in the post-COVID-19 pandemic era.

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