International Journal of Business and Management Sciences **E ISSN**: 2708 – 4337 **P ISSN:** 2708 – 4329
Available online at http://www.ijbmsarchive.com
International Journal of Business and Management Sciences
Volume 06 (01), 2025
Received, 03 January, 2025, Accepted, 08 March, 2025, Online, 10 March, 2025

Interest Rate Enigma: Cracking the Code in Pakistan's Retail Banking

[1]*Dr. Bashir Ahmad,* [2]*Dr. Altaf Hussain,* [3]*Fozia Khan,* [4]*Dr. Nargis Bibi,* [5] *Asma Saeed*

Keywords:
Monetary Policy Transmission, Interest Rate Pass-Through, Retail Lending Rates, Money Market Rate (MMR), Banking Sector Efficiency, Credit Market Competitiveness, Policy Rate Adjustments, Inflation Control, Vector Auto regression (VAR), Impulse Response Functions (IRF).

ABSTRACT

The mechanism of monetary policy transmission from policy rate changes to retail lending rates in Pakistan's banking sector is investigated in this article. Though monetary policy plays a major role in controlling overall demand, the results expose notable structural inefficiencies that compromise its efficiency. Based on Vector Auto regression (VAR) and impulse response functions (IRFs), empirical study reveals slow reaction. Low credit market competitiveness, high switching costs across deposit kinds, and credit rationing policies help to explain the slow change. Furthermore slowing down lending rate changes include asymmetric knowledge and poor corporate governance inside banks, therefore reducing the effect of policy changes on output growth and inflation control. The results imply that structural rigidity in the banking system could be more responsible for Pakistan's consistently high inflation than only transmission lags. The report emphasizes the need of banking sector changes, better financial market competitiveness, and tighter corporate governance consistent with central bank recommendations to increase the efficacy of monetary policy. Future studies will analyze the degree of sophistication of Pakistan's banking industry and investigate whether governance policies hinder the distribution of policy signals, therefore providing a complete knowledge of policy restrictions and possible remedial action.

INTRODUCTION

An incredible increase in public debt figures during the last years gives birth to the questions of debt sustainability and existence of fiscal dominance in economy of Pakistan. Besides multiple economic and political factors, fiscal dominance counts as one of the leading reason for high inflation. However, high inflation figures in Pakistan may result from sluggish and insufficient adjustment of lending interest rates to policy rate changes. Therefore, to make a perfect case for fiscal dominance in Pakistan's economy, we need to check

[1] *Assistant Professor, Department of Economics, ICP. Email: b.ahmad3@icp.edu.pk*
[2] *Assistant Professor, Department of Economics, ICP. Email: altaf@icp.edu.pk*
[3] *PhD Scholar, Department of Economics, ICP. Email: foxeekhan@gmail.com (Corresponding Author)*
[4] *Assistant Professor, Jinnah College for Women, University of Peshawar. Email: nargisikram@uop.edu.pk*
[5] *M.Phil scholar, department of Economics, ICP. Email: saeedasma128@gmail.com*

the interest rate pass through process and establish that transmission mechanism is not a hurdle in passing the desired monetary signals to economy.

Monetary policy transmission mechanism is a significant link and a pivotal element in determining whether the monetary policy can achieve its final goals of stable inflation. It concludes how sturdily the policy-persuaded changes can be transferred to changes in lending rates and consequently to consumption and investment decisions of households.

Central banks all over the world manipulate money market interest rates in varying scales through changes in policy rates for altering lending rates. These lending rates largely shape the behavior of deposit holders and borrowers in respect of their expenditure and investment decisions, influencing the real economic activity and accounts for macroeconomic fluctuations. Moreover, they characterize the prosperity and reliability of banking system, ensuring the financial stability and the economic growth of a country. To conclude, we can say that a more rapid and full transmission of money (market) interest rates to lending rates helps in effectively achieving monetary policy goals and reflects the soundness/ sophistication of a country's banking industry. Economic literature considers banks as non-neutral communicators of monetary policy impulses. During the last few years, the process of money market rates pass through to bank's lending rates has engrossed scrupulous attention. Especially, pricing conduct and bank's lending rates settlement remained the focal point for a number of research studies. However, due attention to immediate 'interest rate pass through' is missing and response of bank's lending rates to changes in money market rates is rare. These studies mostly focus on the interest rate pass-through process related to the properties of first moment. There are very few studies which examine the money market interest rate and lending rates relation of second moment nature, i.e. to see the degree of uncertainty related to the money market rates that affect over the fluctuation of unexpected lending rates.

This article also take up on interest rates pass-through properties of 'first moment' nature, but focuses more on the issue of how the level of stickiness of bank retail rates are shaped by the financial structure[6], i.e., the degree and the pace at with which lending rates are adjusted to their equilibrium long-term level when a shock affects the money market rates[7].

Moreover, the previous studies in this domain made the 'interbank offer rates' equilibrium roughly equivalent to money market rates before testing it for interest rate pass through mechanism. However, in this article, six-month repo rate is taken as the sole representative of money market rate (MMR). The reason is that KIBOR (interbank overnight rate in Pakistan),

unlike LIBOR, is not an appropriate representative of OR and fluctuates fairly different. Moreover, around 90% interbank transactions in Pakistan are based on six-month repo rate.

Relationship between Financial Structure and Bank Rate Stickiness

The relation between financial structure features and retail rates of banks' stickiness can be explained in a number of ways as listed below:

1. Ambiguity about modification in Future Money Market rates

Transmission process of money market rates to Lending rates is vague and there are multiple agreeable explanations of retail rate stickiness. If the banking industry expects costs for making adjustment in lending rates and banks know that changes in MM rates are of temporary nature, financial intermediaries will be reluctant to change its retail rates. In insufficiently liquid money markets, such interest rate movements (supposed to live transitory) are taken as arbitrary modules and therefore lack the ability to duly transform monetary policy changes. The more elongated is the existence of uncertainty regarding the general market rates, the more are chances that banks will not change their rates, negatively affecting the pass through process from policy to retail rates.

2. Costs of tuning rates and Demand for Loans' elasticity

A delayed response of bank's retail rate to MM rates may be due to adjustment costs, i.e. banks prefer to make less frequent changes retail rates. The decision of banking industry to accommodate interest rate according to money market rates is based on adjustments costs. The adjustment costs holdup level for tuning response of retail rates to MMR depends on the bank's loans elasticity. It is assumed that banking industry faces monopolistic competition while advancing loans, i.e., individually, every bank deal with descending loan demand curve. On the basis of this supposition, there can emerge two kinds of situations:

a. Absence of Adjustment Costs

In case there are no adjustment costs in changing the lending rates, banks translates MM rates to their retail rates without impediment. Because, a bank which is not faced with incurring adjustment costs for its retail rates will place its retail rates at such a position where a given MMR becomes equal to marginal revenue on loans.

b. Presence of adjustment Costs

In contrast if bank incur adjustment costs for changing rates in fixed proportion, the banks' retail rate will only modify the expenses of changing rates are lesser than upholding a non-equilibrium rate cost. Normally, when demand for loans is linear and the elasticity of demand for loans is high, the cost will also be high for keeping retail rates out of equilibrium (in the case, when market interest rates are falling). Generally, demand elasticity of loans is lesser in

the short-term than in long-run because of the capability of banks to raise finances from unusual sources even for the emaciated financial markets in the long run. An increase in demand for loan's elasticity over time amplifies the charges of being at outside of the equilibrium in every period. Lending rates are increased by banks in case when present value surpass the fixed costs required for altering them. In such markets, response of lending rates to changes in short-term MMR is incomplete. Thus, it is concluded that the elasticity of demand for loans is manipulated by financial structure besides the fact that there exist a firm and straight association between the LR stickiness and financial structure.

3. Sources of Bank's Refinancing

a. Funding Structure/ Nature of Banking System

Loaning procedure and structure by credit institutions are key influencing aspects for banks' lending rate determination. The additional worth added to deposit holders' savings by financial intermediaries encompass risk transformation; therefore, banks demand a premium for costs for expected risks caused by its lending bustles. Assuming other things unchanged, an adjustment by the banks in its conditions for novel contracts of credits are made if its own structure for financing producer's projects and consumer's expenses changes. The banks whose lending rates are determined by demand dynamics act differently from the banks where these are related to MM rates movements to a limited extent. Similarly, the banks which heavily depend on money market financing normally adjusts retail rates extra-rapidly in comparison to the banks whose response to MM rates in determining retail interest rates is limited. Depositors get more variable interest rates on their saving's deposits recently, however, in Pakistan the savings symbolize a distinctive category of deposits, where rates of interest are moderately influenced with smaller margins by the MR movements. The reason is that in Pakistan, capital markets are under-developed and investment in stock market carries paramount amount of risk. Stock prices are highly volatile and other investment opportunities are considered less liquid. There availability is limited to the deposits of long time periods in Pakistan.

Banks, which are more in this kind of deposits for the reasons of refinancing, feel less pressurized to bring changes in their LR in comparisons to the banks whose costs of refinancing amplify abruptly to the market rates.

b. Maturity Makeup/ Frame work of Refinancing Funds

The bank's credit structure exhibit more stable display when deposit rates are determined on the basis of maturity structure of loans. A pool of long run specific level with opposing maturities, the pace of response adjustment of dissimilar banks to changes in MMR is diverse. The chances of hedging (by means of interest swaps) against interest rate risks increase when

the loans of banks in long term are not matched. In such situation, market developments at the moment attract enormous attraction. Thus, the banks face lots of strain in adjusting their rate they charged for the incremental to variable refinancing expenses is high and price stickiness phenomenon is arduous to prevail.

4. Oligopolistic Competition Models

Banking sector competence is the most viable foundation for macroeconomic steadiness. The role of monetary policy is of critical importance in the development and growth of a country. However, when banking industry in a country is faced with some structural problems like presence of sector spillover effects, less developed legal systems, moral hazards, insufficient contract enforcement, poor corporate governance makeup and highly imperfectly competitive environments, then they have to deal with debtors who divert benefits for themselves. This imperfect competition leads the banks to resort to non-price strategic behavior (reduction of loan quantities) in loans extension decisions and pricing of loan contracts, which consequently reduces the aggregate welfare.

This deviation from the perfect competition in banking industry can be termed as oligopolistic market structure, and results in cartels. As it is obvious that the oligopolistic competitors mostly react to changes in prices in a manner which is not predictable, Price stickiness is surfaced. If the monotonic relationship between banking industry's concentration and degree of stickiness is absent, we can claim that stickiness can be thick in oligopolistic markets when state bank behaves like market manager, manipulating the policy rates. The above contention provides basis for sturdy relationship between policy and retail rates when empirically tested in several economies.

5. Banks behaviour of no-profit amplifying

The assumption of prompt retail rate adjustment to MMR changes depends on the profit maximizing aptitude of financial firms. Nevertheless, these hypotheses fail on the grounds of different financial structure/conditions, i.e. For example, the banks' prejudice against minority borrowers and banking systems where the banks holdup the adjustments of their retail rates due to political pressures or management inefficiency. Broadly speaking, in a situation, when the financial firms fully depends on the free market forces, reaction of bank's lending rates to money market rates will be speedier. In a situation when market strength is weak, inefficiencies prevails and besides retail rates' tackiness.

6. Other Reasons of Price Stickiness

Lending rate stickiness may be caused by a number of other factors. Some of them are listed below:

- Credit demand: The pass-through impact is influenced by the credit demand as it compels the banks to adjust lending rates more quickly to MM rates. The speed of adjustment of LR to MMR differs over business cycle, indicating that market rates are not followed in a uniformly anti-cyclical manner by bank's interest rate margins.
- The less is the competition in the banking sector in a country, the more is interest rate stickiness. I.e. in a situation when there exists a feeble competition between banks, any decrease in MM rates will be slowly adjusted in retail interest rates in comparison to deposit rates as banks wish to increase their profit margins. In contrast, when the market rates are increasing, the banks mostly seek to postpone contraction of profit margins. The technique used for such accomplishment is to pass the increasing costs of financing to their clients by charging them with higher LRs.
- Another determinant in literature on monetary policy transmission, regarding the price stickiness, is bank size. The sizes of banks have direct relationship with their capability to admittance of substitutable funds sources. Hence, if the monetary policy gets tighten, the banks which are undersized face the problem of decreased deposits and their profits tend down. To overcome this shrink in profit scrap, they keep Lending rates high to detain the required finances from the market. However, in Pakistan, only five large banks accounts for a huge share of more than 52% of the total banking industry, and therefore, it is highly unlikely to assume that the rates offered by small banks will make any difference. Moreover, banks can keep their asset bases intact through managing it largely from borrowing of inter-bank, where the share of small banks is very marginal, due to the risk factor attached with it.

Objectives

- To investigate the the degree and speed of interest rate pass-through from money market rates to retail lending in Pakistan's banking sector.
- To investigate the short-term and long-term effects of policy rate changes on lending rate evolution.
- To offer policy suggestions for increasing the efficiency and responsiveness of the interest rate transmission mechanism to so help to manage inflation and maintain Pakistan's economic stability.

LITERATURD REVIEW

Economic study has focused especially on the mechanism of monetary policy—especially the pass-through of the interest rate. Studies of how policy rate changes affect retail bank rates in Pakistan have highlighted the complexity and inefficiencies in the system. Using a Vector

Autoregression (VAR) model, Agha et al. (2005) undertook a key study to investigate Pakistan's monetary transmission mechanism. Their results suggested inefficiencies in the transmission process since monetary policy shocks had a major but delayed impact on output and prices. Fazal and Salam's 2013 further investigation on Pakistan's interest rate pass-through found that, in both short and long terms, the effect is more noticeable on the loan channel than the deposit channel. However, the loan channel's adjustment speed was found to be higher.

Recent research have kept underlining how delayed and partial interest rate pass-through is in Pakistan. Ahmed et al. (2019) for example found that the pass-through to the loan rate was incomplete and slow, requiring over a year for complete transmission. Low consumer demand elasticity, restricted credit market competitiveness, and large expenses related with asymmetric knowledge help to explain this slow change. The State Bank of Pakistan (2022) has addressed similar problems, stating that current research mostly concentrates on particular elements of the transmission mechanism, usually utilizing the T-bill rate as a proxy for the policy rate. Their study implies that a thorough knowledge of the transmission process calls for analyzing several elements, including market structures and the competitiveness of the banking sector.

Furthermore adding fresh dynamism to the banking industry is the emergence of Islamic finance in Pakistan, best shown by Meezan Bank's explosive expansion. The growing demand for Sharia-compliant financial products could affect conventional pass-through systems for interest rates, so more study in this field is needed.

Research Gap

Although current research have found partial and delayed pass-through of interest rates in Pakistan, further detailed study is needed to measure the degree and pace of this transmission. More especially, little is known about how the pass-through mechanism is influenced by financial market characteristics like banking sector competitiveness and switching costs. Furthermore not much investigated is how the expanding Islamic financial sector affects conventional monetary transmission systems.

METHODOLOGY

Data Description

The analysis uses monthly data from 2005 to 2023, sourced from the State Bank of Pakistan (SBP), International Monetary Fund (IMF), and Pakistan Bureau of Statistics.

The Model

To examine the association between financial structure of banking industry with banks retail rates (RR), we will take into account only the market interest rate, discount rate, and banks' lending rates. In such a monopolistic model, the banking industry's LR in long run are not only

influenced by MMR and policy rates but also by change in demand for bank's loans because of apparent riskiness of loans. However, for simplification we use (estimate) the following model for our analysis:

$$\boldsymbol{i_t} = \boldsymbol{\beta_0} + \sum_{\boldsymbol{k=1}}^{\boldsymbol{p}} \boldsymbol{\beta_{1,k} i_{t-k}} + \sum_{\boldsymbol{k=1}}^{\boldsymbol{p}} \boldsymbol{\beta_{2,k} m_{t-k}} + \sum_{\boldsymbol{k=1}}^{\boldsymbol{p}} \boldsymbol{\beta_{3,k} D_{t-k}} + \boldsymbol{\varepsilon_t}$$

- $\boldsymbol{i_t}$: Bank's lending rate (LR) at time t
- $\boldsymbol{m_t}$: Money market rate (MMR) at time t
- $\boldsymbol{D_t}$: Discount rate (DR) at time t
- $\boldsymbol{\varepsilon_t}$: Error term at time t
- $\boldsymbol{\beta_0}$: Constant term.
- $\boldsymbol{\beta_{1,k}, \beta_{2,k}, \beta_{3,k}}$, ….**:** Coefficients for the lagged values of LR, MMR, and DR, respectively.
- $\boldsymbol{p}$: Optimal lag length determined by information criteria (e.g., AIC, BIC).

To elaborate , we start with the following vector recursive model:

$$\beta_0 X_t = \beta_1 X_{t-1} + \beta_2 X_{t-2} + \cdots \ldots + \beta_p X_{t-p} + \varepsilon_t$$

Where $X_t = [DR_t, M\acute{M}R_t, LR_t]$ is a vector of endogenous variables at time t.

- β_0 is a **contemporaneous coefficient matrix** that captures the instantaneous relationships between the variables.
- $\beta_1, \beta_2, \ldots\ldots \beta_p$ are **lagged coefficient matrices**.
- $\varepsilon_t = \varepsilon\_(DR, t)$, $\varepsilon\_(MMR, t)$, $\varepsilon_(LR, t)'$is a vector of **structural shocks**, assumed to be uncorrelated and with zero mean, i.e., E[$\varepsilon_t \varepsilon_t{}'$] = Σ_ε where Σ_ε is a diagonal matrix.

We establish a recursive ordering on the variables to find the structural shocks. Assuming that β_0 is a lower triangular matrix with ones on the diagonal helps one to accomplish Institutional knowledge and economic theory guide the recursive ordering:

Discount Rate (DR)

Not contemporaneously influenced by other factors, the central bank sets the discount rate depending on macroeconomic situation. The Money Market Rate (MMR) Though it is not contemporaneously influenced by the lending rate, the money market rate responds to changes in the discount rate. The lending rate, or Bank Lending Rate, responds to variations in the money market rate as well as the discount rate.

$$\beta_0 = \begin{bmatrix} 1 & 0 & 0 \\ b_{21} & 1 & 0 \\ b_{31} & b_{32} & 1 \end{bmatrix}$$

b_{21}: catches DR's concurrent influence on MMR.

b_{31}: catches DR's concurrent influence on LR.

b_{32} : catches MMR's concurrent impact on LR.

Multipling both sides of the structural VAR by β_0^{-1} yields the reduced-form VAR.

$$X_t = A_1 X_{t-1} + A_2 X_{t-2} + \cdots \ldots + A_p X_{t-p} + \mu_t$$

$A_i = \beta_0^{-1}$, B_i for i= 1, 2, …… p

$\mu_i = \beta_0^{-1}\varepsilon_t$ is the reduced-form error term with $\mathrm{E}[\mu_t \mu_t'] = \Sigma_\mu$

By use of the recursive structure on β_0 one can identify the structural shocks ε_t We particularly apply the Cholesky decomposition of the reduced-form error covariance matrix Σ_μ:

$$\Sigma_\mu = \beta_0^{-1} \Sigma_\varepsilon (\beta_0^{-1})'$$

The Cholesky decomposition guarantees that β_0^{-1} ; so ε_t , is diagonal and corresponds to the recursive ordering as lower triangular.

ANALYSIS

Model Estimation and Empirical Analysis

1. Vector Auto-regressions (VARs)

We handle the Money Market Rate (MMR) and Lending Rate (LR) as functions of their own lagged values, discount rates, and innovation terms (εt), therefore avoiding the complexity of structural models. These disturbance terms and their own lags may coincide contemporaneously with right-hand-side variables. Every series was made immobile (Appendix I) to avoid erratic results compromising forecast accuracy. OLS offers consistent estimates free from simultaneousity issues since only lagged values of MMR and LR show on the right-hand side. OLS keeps its efficiency even with contemporaneous correlation in innovations.

Based on four main selection criteria, the results demonstrate that at the fifth lag changes in MMR and the discount rate significantly influence LR. Appendix II has VAR estimates that show a 35% change in bank lending rates results from a unit change in MMR at the fifth lag. But the changed R-square shows a poor match since the model explains less than 10% of retail rate fluctuation. The first equation often expresses how one should establish rates. Under steady-state (error term deleted), LR responds to MMR (6-month repo rate or marginal funding cost), therefore approximating a monopolistic competition model.

For simplicity, certain possibly important factors were eliminated, which produced serial correlation in the error term. Reflecting the administrative character of policy and market rates, the partial adjustment mechanism of the model explains lagged and current variables. Policy

rates may be influenced by political forces, hence promoting rate stickiness. Discount rate lags imply that policy rate changes speed LR convergence to long-term equilibrium. Both have to be assessed from a policy perspective since monetary authorities regulate policy and market rates.

2. Recursive VAR Model

Recursive VAR models are used to guarantee no autocorrelation or interdependence among endogenous variables, therefore producing objective results and so improving the estimate. The estimate starts in phases:

LR is regressed first on its 12-month delays. With the fourth and fifth lags proving most important, iterative methods create 4096 potential equations.

We evaluate MMR's influence on LR using LR lags from Stage 1 as constraints. Once more, there are forty-four thousand equations analyzed; the first, fourth, and sixth delays of MMR exhibit the most impact.

Using lags chosen in prior rounds as constraints, we investigate how the discount rate influences LR. The most important lag of the discount rate turns out to be the second one.

The recursive VAR results show unidirectional causality: DR effects LR without feedback; MMR influences LR but not vice versa. The modified R-square indicates that the model explains less than 30% of retail rate swings, therefore supporting the limited pass-through of monetary policy.

While the model explains just 30% of retail rate volatility (Appendix III), a unit change in MMR results in a 60-basis-point shift in LR. When DR is omitted, MMR's impact on LR increases to 70%; overall explanatory power falls (adjusted R-square = 30%). Only 23% of MMR changes transfer through to LR in the first month; over six months to a year, this rises to 60% showing slow transmission. Limited banking competition, inelastic credit demand, strong information asymmetry, credit rationing produce slow pass-through results.

The results expose the shortcomings in the efficacy of monetary policy. In terms of inflation control, slow, inadequate rate pass-through lowers policy effectiveness. In the near term, fiscal instruments—such as Treasury bill auctions—may more effectively affect overall demand. Weak bank governance and structural problems like fiscal dominance most certainly help to explain ongoing inflation rather than transmission delays. Improving corporate governance would help to enhance inflation targeting and monetary policy signal transmission. Pakistan's monetary transmission system keeps working despite delays; lending rates finally change to match MMR changes. Still, structural elements seem to be driving persistent inflation, not transmission problems. Emphasizing structural banking reforms and the possible

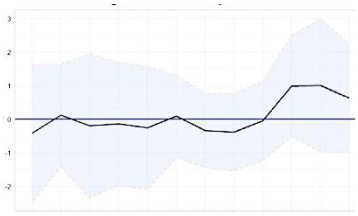
complementarity of fiscal policies for macroeconomic stability, future study should investigate the interaction between corporate governance and policy efficacy.

3. Impulse response function

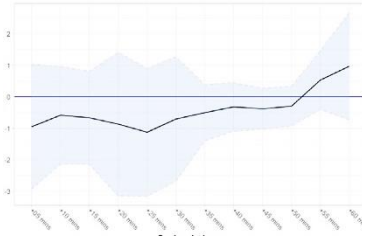
To know the response of MMR and LR to a temporary policy rate shock in the process of interest rate transmission pass through, we use impulse responses functions (IRF). The mechanism by which changes in the central bank's policy instruments, such the discount rate (DR), affect more general economic variables, including money market rates (MMR) and bank lending rates (LR), so influencing economic activity. Using impulse response functions (IRFs) in response to shocks in the discount rate, money market rate, and bank lending rate, this method examines the dynamic interactions among these variables. Together with the central bank's role in guaranteeing financial stability and managing expectations, the results clarify the gradual and consistent aspects of monetary policy transmission.

The results of IRF indicate that MMR display a kind of cobweb fluctuations over its long term equilibrium level in response to one-time discount rate shock. In the beginning, a discount rate shock causes a right shock display in DR, which means that DR in the short term is non-sticky. The instant response of DR in the first period to a 1 %age point shock in DR drives it to its peak budge to become positive. however, subsequently it drops down extra-stridently, reaching underneath the equilibrium level (long term) by second end-time period.

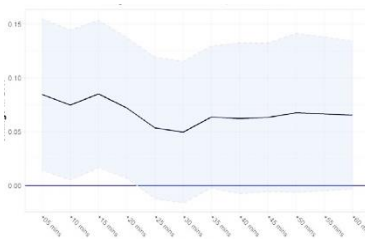
Shock of DR to DR



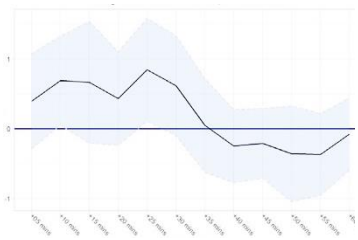
Response of MMR to DR



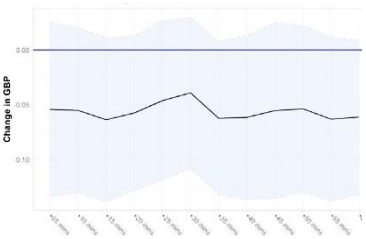
Response of LR to DR



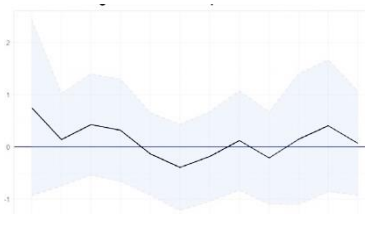
Response of DR to MMR



Response of MMR to MMR



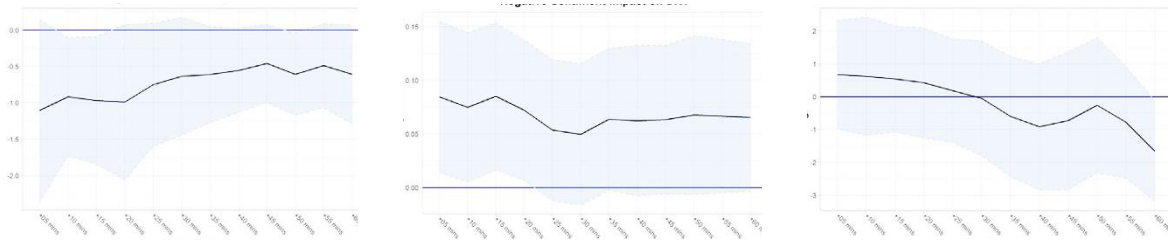
Response of LR to MMR



Response of DR to LR

Response of MMR to LR

Response of LR to LR



a. Response to a shock in the discount rate

The system suffers significant and long-lasting effects when the discount rate (DR) suddenly changes, a sign of a central bank policy change. Based on the impulse response function (IRF), a one percentage point increase in DR usually holds over several periods. For instance, the DR is roughly 80% of the original shock in the first month and shows significant inertia even if its effect reduces by the sixth month; the DR ranges in 20–30% over its pre-shock level. This tenacity emphasizes the dependability and basis of central bank policy since changes in monetary policy are not quickly undone in line with the central bank's commitment to maintain price stability and control of inflation.

Cobweb-like fluctuations in the transfer of a DR shock to the money market rate (MMR) suggest the market's response to central bank signals. Following an overshoot in which MMR falls below its long-term equilibrium in the second and third months, the IRF shows a first large rise in MMR by 60 basis points in the first month, followed in a slow recovery to equilibrium by the sixth month. This trend emphasizes the short-term volatility in financial markets following a policy shock. While the ensuing overshoot and convergence show market players' responses to the changed policy environment, the first surge in MMR indicates the direct effect of increasing borrowing costs for banks.

Delays and rigidity in the distribution of a DR shock on bank lending rates (LR) reflect the slow change of loan pricing by banks. The IRF shows a lagged reaction in LR; the highest effect shows up three or five months after initial shock. From 0.25 to 0.30 percentage points over the baseline, LR increases the most; then, it gradually moves to a new equilibrium in the next months. This delayed pass-through fits the constant features of loan pricing, in which banks progressively change their lending rates in response to changes in financing availability. With the need to balance profitability with customer retention, the delayed reaction also suggests operational and competitive constraints inside the banking sector.

b. Response to a Shock in Rates of Money Markets (MMR Shock)

With a slow and lagged effect, a disturbance in the money market rate (MMR), like an abrupt rise in KIBOR or the 6-month repo rate, influences the discount rate (DR). The IRF shows a 0.10 to 0.15 percentage point increase in DR during the first months, followed by a consistent

regression to equilibrium in next quarters. This answer shows the reaction of the central bank, in which officials change the discount rate in response to changes in the state of the market. The low response amplitude suggests that the central bank prefers policy stability above instantaneous reactions to market fluctuations. The IRF shows the lifetime of an MMR shock, meaning that money market rates stay high for several periods following the initial shock. With the effect declining gradually, an MMR shock accounts for 55% of its expected error variation over a 12-month period; MMR persists at 20–30% even six months from its pre-shock level. This persistence emphasizes the self-reinforcing nature of money market rates, in which variations in MMR are shaped by both market conditions and expectations of upcoming policy actions. The slow drop also reflects the inertia in the behavior of market players adjusting their portfolios and borrowing strategies in response to the changed interest rate environment.

Delays in the transmission of an MMR shock to bank lending rates (LR) point to sluggish loan pricing modification by banks. Following a one-unit MMR shock, LR shows a 35% increase over the baseline; the IRF indicates a delay of three to five months before the whole effects of the MMR shock are visible in LR, followed by a slow approach to a new equilibrium in next months. This slow reaction emphasizes the long process of monetary policy transmission in which changes in market rates need time to affect consumer and producer loan rates. The delayed pass-through also shows the rigidity in loan pricing as banks negotiate the need to change rates in line with customer relationships and competitive dynamics.

c. Reactions to a Lending Rate Shock (LR Shock)

Potentially stemming from a rapid change in loan demand or internal banking policy, a perturbation in bank lending rates (LR) has limited effect on the discount rate (DR). The IRF projects a 0.10 to 0.15 percentage point increase in DR in the medium term, thereby guiding a slow return to balance in the next quarters. This measured response shows how detached the central bank is from transient fluctuations in the lending market since officials give top priority to overall macroeconomic indicators over short changes in loan rates. Similarly limited is the effect of an LR shock on the money market rate (MMR), as the impulse response function shows a slight increase in MMR of about 0.10 percentage points in the medium term, then followed by a consistent return to equilibrium in the next months. This little influence suggests that although LR is a major outcome of monetary transmission, its short-term changes are less efficient in changing market rates. The sluggish reaction also shows the difference between the lending and money markets, where changes in loan rates do not immediately match changes in banks' financing costs. The IRF shows the lifetime of an LR shock, meaning that lending rates stay high for several periods following the initial shock. Over a 12-month period, a shock to

LR accounts for 60% of its own forecast error variation; the effect reduces progressively, leaving LR 20–30% over its pre-shock level after six months. This tenacity emphasizes how stiff the lending market is by nature since banks progressively change their loan rates in response to changes in funding availability and competitive dynamics. The slow drop also shows the operational restrictions banks have in trying to keep profitability while keeping customer base.

In the end, the LR rates congregate back to its long-run equilibrium. As is evident, the response of MMR is immediate and more responsive to a unit change in DR in comparison to lending rates response to a unit change in money market interest rates (which is sluggish and starts late), signifying lending rate stickiness in the first place.

Emphasizing the dynamic interaction among the discount rate, money market rate, and bank lending rate, the impulse response analysis provides important new perspectives on the transmission mechanism of monetary policy. The results underline the delayed and consistent nature of monetary policy transmission as well as the central bank's role in guaranteeing financial stability and hence stabilizing expectations.

CONCLUSION

Monetary policy shocks—especially changes in the discount rate (DR) are communicated to market and lending rates incrementally, usually with considerable lags. The stiffness of loan pricing and the inertia of market behavior greatly influence the dynamic reaction of the system. The long-standing effects highlight the stability and dependability of central bank policies since market players change their expectations and actions in response to policy signals. Maintaining price stability and lowing inflation depend on this credibility. The minimal effect of lending rate (LR) shocks on the discount rate and money market rate (MMR) shows that the central bank is mostly insulated from short-term lending market volatility, so enabling policymakers to concentrate on overall macroeconomic objectives such financial stability and economic growth.

Gradual change in lending rates suggests operational and competitive constraints in the banking sector. Banks have to carefully balance rate changes with the need of customer retention and profit preservation to produce a slow and inadequate flow of changes in monetary policy. By stressing the intricate interaction of the discount rate, money market rate, and lending rates, impulse response research provides a comprehensive knowledge of the monetary policy transmission process. The results show the long-lasting but consistent nature of this process, therefore highlighting the central bank's role in controlling expectations and advancing financial stability. Policymakers aiming at macroeconomic targets have to take these

transmission lags into account while developing appropriate monetary policies. Unlike directly affecting supply-side factors, monetary policy mostly influences aggregate demand. The elasticity of demand and supply for financial assets in response to changes in the MMR determines the efficacy independent of the direct influence of the central bank. The sophistication of the financial system and the competitiveness of the market influence the elasticities; these factors are sometimes overlooked when evaluating the fastness and effectiveness of policy rate pass-through.

The transmission lags in Pakistan's economy are investigated in this article, with particular attention to how policy rates affect retail lending rates to help to lower inflation. Based on empirical data, just 23% of a change in the MMR is reflected in bank lending rates in the first month; the total pass-through over a longer period approximates 60%. Usually reflecting the semi-competitive nature of Pakistan's banking system and the significant switching costs connected with demand deposits and savings, changes to lending rates usually take six months to a year to show. Though ultimate alignment, the short-term response of lending rates to changes in money market rates is generally delayed and inadequate.

Using impulse response functions (IRFs), robustness analysis confirms these results by showing that, in response to changes in the discount rate, bank lending rates move more sloppishly than money market rates. Low elasticity of consumer demand, limited competition in lending markets, and information asymmetries most likely contribute to this stickiness of consumer demand. Furthermore aggravating the slow change of lending rates is extensive credit rationing in the market. Although the transmission mechanism runs within reasonable bounds, the results of vector autoregression (VAR) and impulse response function (IRF) research imply that its intrinsic delays and partial corrections might not be the main causes of Pakistan's ongoing inflation.

Discount rate changes lose their effectiveness in influencing production growth and inflation when financial intermediaries slow down their transmission to lending rates. The inelasticity of deposit demand causes slow changes in lending rates, therefore reducing the effectiveness of the transmission mechanism. In these cases, temporary fiscal policies—such as fiscal auctioning—could more effectively affect total demand by changing the savings pool and enhancing loan availability.

Although slow, Pakistan's monetary transmission system is very consistent. Transmission inefficiencies by themselves seem unlikely to explain the country's continuous high inflation. Given that monetary policy is mostly transmitted through the banking industry, shortcomings in bank-level corporate governance could impede the efficient flow of policy signals. Further

investigation is needed to ascertain the degree to which corporate governance policies in Pakistan's banking sector might compromise the effectiveness of monetary policy and to assess how well they match central bank rules. The next step of this research will evaluate the banking sector's governance complexity and investigate whether mismatched policies help to create transmission bottlenecks, therefore impeding efforts at inflation control.

References

Adelaide, H., Campello, M., & Weisbach, M. S. (2022). Corporate governance and financial constraints: A literature review. *Journal of Corporate Finance, 74*, 102435.

Adrian, T., & Shin, H. S. (2010). Liquidity and leverage. *Journal of Financial Intermediation, 19*(3), 418–437.

Angeloni, I., Buttiglione, L., Ferri, G., & Gaiotti, E. (1995). *The credit channel of policy across heterogeneous banks: The case of Italy*. Banca Italia-Servizio di Studi.

Angeloni, I., & Ehrmann, M. (2003). Monetary transmission in the euro area: Early evidence. *Economic Policy, 18*(37), 469–501.

Berger, A. N., & Hannan, T. H. (1989). The price-concentration relationship in banking. *The Review of Economics and Statistics, 71*(4), 291–299.

Bernanke, B. S., & Blinder, A. S. (1988*). Credit, money, and aggregate demand (NBER Working Paper No. 2534*). National Bureau of Economic Research.

Bernanke, B. S. (1993a, December). How important is the credit channel in the transmission of monetary policy?: A comment. *In Carnegie-Rochester Conference Series on Public Policy (Vol. 39,* pp. 47–52).

Bernanke, B. S. (1993b). Credit in the macroeconomy. Federal Reserve Bank of New York *Quarterly Review, 18*, 50.

Borio, C. E., & Fritz, W. (1995). *The response of short-term bank lending rates to policy rates: A cross-country perspective (BIS Working Paper No. 27).* Bank for International Settlements.

Berlin, M., & Mester, L. J. (1999). Deposits and relationship lending. *Review of Financial Studies, 12*(3), 563–594.

Carlstrom, C. T., & Fuerst, T. S. (1997). Agency costs, net worth, and business fluctuations: A computable general equilibrium analysis. *American Economic Review, 87*(4), 893–910.

Claessens, S., Ghosh, S. R., & Mihet, R. (2012). *Monetary policy, macroprudential policies, and credit growth in emerging market economies*. IMF Staff Discussion Note.

Cihak, M., Demirgüç-Kunt, A., Feyen, E., & Martínez Pería, M. S. (2016). Measuring the underlying drivers of credit booms. Journal of Money, *Credit and Banking, 48*(2–3), 321–348.

Cottarelli, C., & Kourelis, A. (1994). *Financial structure, bank lending rates, and the transmission mechanism of monetary policy (IMF Staff Paper No. 94/39*). International Monetary Fund.

Cottarelli, C., Ferri, G., & Generale, A. (1995). Bank lending rates and financial structure in Italy: A case study. *IMF Staff Papers, 42*(1), 670–700.

De Bondt, G. J. (2005). Interest rate pass-through: Empirical results for the euro area. *German Economic Review, 6*(1), 37–78.

Dell'Ariccia, G., Igan, D., & Laeven, L. (2017). The real effects of bank regulatory reforms. *Journal of Financial Economics, 126*(1), 45–74.

Dong, L., & Zhang, Y. (2021). Monetary policy transmission in emerging markets: The role of financial intermediaries. *Journal of International Money and Finance, 113*, 102407.

Flannery, M. J. (1981). Market interest rates and commercial bank profitability: An empirical investigation. *The Journal of Finance, 36*(5), 1085–1101.

Gambacorta, L. (2008). How do banks set interest rates? *European Economic Review, 52*(5), 792–819.

Garcia, M., & Kumar, S. (2022). Corporate governance in banking: Recent developments and future challenges. *Journal of Banking Regulation, 23*(1), 112–130.

Ghosh, A. R., Kim, D., Mendoza, E. G., & Ostry, J. D. (2018). Rising global imbalances: The role of financial globalization. *IMF Economic Review, 66*(2), 317–334.

Hannan, T. H., & Berger, A. N. (1991). The rigidity of prices: Evidence from the banking industry. *American Economic Review, 81*(4), 938–945.

Hülsewig, O., Mayer, E., & Wollmershäuser, T. (2009). Bank behavior, incomplete interest rate pass-through, and the cost channel of monetary policy transmission. *Economic Modelling, 26*(6), 1310–1327.

Khalid, A. M., & Hanif, M. N. (2005). *Corporate governance for banks in Pakistan: Recent developments and regional comparisons* [CMER Working Paper].

Khawaja, M. I. (2007). Exchange market pressure and monetary policy: Evidence from Pakistan. *The Lahore Journal of Economics, 12*(2), 83–114.

Khawaja, M. I., & Din, M. U. (2007). Instrument of managing exchange market pressure: Money supply or interest rate? *The Pakistan Development Review, 46*(1), 381–394.

Klein, P. A. (1971). *The cyclical timing of consumer credit, 1920–67*. National Bureau of Economic Research.

Kobayashi, T. (2008). Incomplete interest rate pass-through and optimal monetary policy. *International Journal of Central Banking, 4(*3), 77–118.

Kwapil, C., & Scharler, J. (2006). Limited pass-through from policy to retail interest rates: Empirical evidence and macroeconomic implications. *Monetary Policy and the Economy, 4*, 26–36.

Lee, S., & Park, Y. (2024). Financial market sophistication and monetary policy transmission. *Journal of Financial Markets, 55*, 101–119.

Mahmood-ul-Hasan Khan. (2009, March). Concentration and competition in the banking sector of Pakistan (SBP Working Paper Series No. 28). State Bank of Pakistan.

Mojon, B. (2000). Financial structure and the interest rate channel of ECB monetary policy [Working Paper].

Raunig, B., & Scharler, J. (2009). Money market uncertainty and retail interest rate fluctuations: A cross-country comparison. *German Economic Review, 10(2), 176–192.*

Sander, H., & Kleimeier, S. (2004). Convergence in euro-zone retail banking? What interest rate pass-through tells us about monetary policy transmission, competition and integration. *Journal of International Money and Finance, 23(3), 461–492.*

Sander, H., & Kleimeier, S. (2006a). Interest rate pass-through in the common monetary area of the SACU countries. *South African Journal of Economics, 74(2), 215–229.*

Sander, H., & Kleimeier, S. (2006b). Expected versus unexpected monetary policy impulses and interest rate pass-through in euro-zone retail banking markets. *Journal of Finance and Banking, 30(7), [Page range not specified]*.

Smith, J., & Chen, L. (2023). Monetary policy and bank lending: New evidence from emerging markets. *Journal of Monetary Economics, 135, 45–62.*

Weth, M. A. (2002). The pass-through from market interest rates to bank lending rates in Germany (Economic Research Centre Discussion Paper No. 11/02). Deutsche Bundesbank.

APPENDICES

Appendix I : **Augment Dickey-Fuller Unit Root tests**

	I0 (Prob.)	I1 (Prob.)
LR	0.6729	0.0000
DR	0. 9236	0.0000
MMR	0. .7279	0.0000

Appendix II: VAR Lag Order Selection Criteria

Table I: Endogenous Variables: DLR DMMR & Exogenous Variables: DDR

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-58.35593	NA	0.036558	2.355899	2.44265.7*	2.393349
1	--55.33320	5.689847	0.037997	2.405224	2.632497	2.442072
2	-49.44192	10.62741	0.035315	2.331056	2.749845	2.475802
3	-46.35165	5.3322161	0.03668	2.366732	2.897037	2.569377
4	-40.68810	9.328203	0.034500	2.301494	2.983315	2.562038
5	-23.7216	26.6 1413*	0.020880*	1.793004*	2.626340	2.111446*
6	-22.64283	1.607574	0. 023631	1.907561	2.892414	2.283903
7	-20.03131	3.686251	0. 025275	1.962032	3.098400	2.396272
8	-18.49427	2.050090	0.028320	2.058599	3.346483	2.550737
9	- 14.65501	4.817900	0.029143	2.064902	3.504302	2.614939
10	- 11.25095	4.004768	0.030657	2.088273	3.679128	2.696208
11	-7.193911	4.454792	0.031748	2.086036	3.828467	2.752870
12	- 6.149002	1.065397	0.037278	2.201922	4.095868	2.925655

Appendix III: Recursive VAR Model

Table I: Recursive VAR - When LR depends on its lag and lag of MMR and DR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLR(-4)	0.303682	0.123321	2.462522	0.0172
DLR(-5)	-0.375825	0.122076	-3.078630	0.0033
DMMR(-1)	0.231732	0.130672	1.773385	0.0821
DMMR(-4)	0.384575	0.142775	2.693575	0.0095
DMMR(-6)	- 0.189124	0.152973	- 1.236318	0.2220
DDR(-2)	0.327635	0.133723	2.450097	0.0178

Table II: Recursive VAR - When LR depends on its lag and lag of MMR only

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLR(-4)	0.3240	0.1288	2.5151	0.0150
DLR(-5)	- 0.3888	0.1277	-3.0445	0.0037
DMMR(-1)	0.3717	0.123043	3.0211	0.0039
DMMR(-4)	0.4131	0.1490	2.7730	0.0077
DMMR(-6)	- 0.1906	0.1602	-1.1899	0.2395

Table III: Residual Test – Correlogram of Residual Square

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. ǀ . ǀ	. ǀ . ǀ	1	0.005	0.005	0.001	0.971
.* ǀ . ǀ	.* ǀ . ǀ	2	- 0.144	-0.144	1.271	0.530
. ǀ* . ǀ	. ǀ* . ǀ	3	0.172	0.177	3.121	0.373
.* ǀ . ǀ	.* ǀ . ǀ	4	- 0.060	-0.092	3.349	0.501
. ǀ . ǀ	. ǀ . ǀ	5	- 0.001	0.059	3.349	0.646
.* ǀ . ǀ	.* ǀ . ǀ	6	- 0.105	-0.173	4.079	0.666
. ǀ . ǀ	. ǀ* . ǀ	7	0.034	0.095	4.159	0.751
. ǀ* . ǀ	. ǀ . ǀ	8	0.131	0.065	5.343	0.720
. ǀ . ǀ	. ǀ . ǀ	9	-0.012	0.060	5.353	0.802
. ǀ . ǀ	. ǀ . ǀ	10	-0.017	-0.038	5.374	0.855
. ǀ . ǀ	. ǀ . ǀ	11	0.030	0.019	5.441	0.908

. | . |	. | . |	12	0.024	0.005	5.482	0.940
. | . |	. | . |	13	0.032	0.065	5.559	0.951
. | . |	. | . |	14	-0.007	0.003	5.563	0.976
. | . |	. | . |	15	0.024	0.033	5.610	0.986
. | . |	. | . |	16	0.029	-0.010	5.679	0.991
. | . |	. | . |	17	-0.003	0.019	5.680	0.995
. | . |	. | . |	18	-0.000	-0.005	5.680	0.997
. | . |	. | . |	19	- 0.002	0.009	5.680	0.999
. | . |	. | . |	20	- 0.011	-0.028	5.691	0.999