DO PERSONAL LOANS PROMOTE SUSTAINABLE GROWTH? EVIDENCE FROM ARDL ANALYSIS IN INDIA

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ABSTRACT

This study examines the role of personal loans in supporting sustainable economic growth in India by analysing their short-term and long-term effects on Gross Domestic Product (GDP). Using quarterly macroeconomic data, the analysis employs the Autoregressive Distributed Lag (ARDL) model, followed by Bounds Testing and an Error Correction Model (ECM) to determine the speed at which the system returns to equilibrium. The findings show that personal loans have a positive and statistically significant impact on GDP in the short run, indicating that credit-driven consumption can stimulate economic activity. However, in the long run, this effect becomes negative, suggesting that excessive reliance on consumption-oriented borrowing may undermine sustained growth. In contrast, Gross Fixed Capital Formation (GFCF) maintains a consistently positive influence in both the short and long run, underscoring the importance of investment-focused lending. The robustness of the model is supported by diagnostic tests such as the Durbin–Watson statistic, Breusch–Pagan test, and CUSUM/CUSUMSQ stability assessments. Overall, the study suggests that while personal loans can provide a temporary boost to economic activity, long-term stability requires redirecting credit flows toward productive and investment-led sectors. Accordingly, the paper recommends a strategic shift from consumption-based lending to investment-driven credit policies to strengthen India's long-term growth trajectory.

Keywords
ARDL Model; Economic Growth; Error Correction Model (ECM); Personal Loans; Sustainable Development.

1. INTRODUCTION

The banking sector is central to economic development, as it mobilises savings, allocates credit, and enables financial intermediation across different segments of the economy. Within this framework, personal loans have become one of the fastest-growing components of bank lending in India, driven by rising incomes, rapid urbanisation, the expansion of digital lending platforms, and easier access to consumer credit (RBI, 2023). As household borrowing continues to rise, an important policy question emerges: Do personal loans support sustainable economic growth, or do they simply fuel short-lived consumption? Addressing this question is particularly relevant for policymakers and regulators in light of India's increasing dependence on credit-led demand.

Although previous research has explored the contribution of bank credit to economic growth (Levine, 2005; King & Levine, 1993), much of the focus has been on commercial or investment-related lending. Personal loans,

which largely finance consumption, have received comparatively little empirical attention. Recent developments show a notable shift in India's credit composition, with personal loans accounting for more than 30% of total bank lending in 2023—surpassing credit extended to industries and agriculture (RBI, 2023). Despite this rapid expansion, it remains unclear whether such lending enhances productive capacity in the long run or merely boosts short-term aggregate demand.

The existing literature indicates that consumer credit can stimulate immediate economic activity (Mian & Sufi, 2018), yet excessive household borrowing may lead to financial stress and diminish future consumption potential (Jappelli & Pagano, 1994). In the Indian context, research examining the long-term impact of personal loans on GDP is limited, and the available evidence is inconclusive. This gap underscores the need for further investigation using a dynamic econometric framework.

Against this backdrop, the present study analyses the short-run and long-run effects of personal loans on GDP in India using the Autoregressive Distributed Lag (ARDL) approach. Quarterly macroeconomic data are utilised to explore dynamic interactions, and bounds testing is applied to verify the presence of long-run co-integration. By differentiating between short-term consumption-driven growth and long-term economic sustainability, the study contributes to ongoing discussions in financial economics and policy regarding the efficiency of credit allocation in India. The findings are expected to guide reforms related to credit regulation, household debt management, and financial sector policy, particularly in achieving a balanced mix of personal lending and investment-driven credit.

2. LITERATURE REVIEW

The relationship between credit expansion and economic growth has long been a central theme in the literature on financial development. Early contributions by Schumpeter (1911) and later by King and Levine (1993) argue that a well-functioning financial system supports innovation, enhances productivity, and ultimately promotes sustained economic growth. Subsequent empirical research reinforces this view, showing that the availability of credit is essential for stimulating business investment and aggregate demand (Levine, 2005; Beck et al., 2000).

2.1 Personal Loans and Economic Growth: Mixed Evidence

In recent years, consumer credit—particularly personal loans—has drawn attention for its role in driving short-term economic activity. Mian and Sufi (2018) show that increases in household borrowing can temporarily raise consumption and output. Similarly, Dynan and Kohn (2007) suggest that easier access to consumer finance boosts retail spending and short-run GDP growth. However, a persistent reliance on consumption-led borrowing can lead to household debt accumulation, which may ultimately hinder long-term growth (Jappelli & Pagano, 1994).

2.2 Studies Highlighting Long-Run Risks

A number of studies caution that excessive personal borrowing may undermine economic stability over time. Girouard, Kennedy, and André (2006) note that high household debt levels weaken future consumption capacity and increase financial vulnerabilities. Büyükkarabacak and Valev (2010), using evidence from emerging economies, demonstrate that expanding household credit often crowds out business lending, thereby reducing

long-term productive capacity. Similarly, Mendoza and Terrones (2012) find that credit-driven consumption booms tend to heighten the risk of financial crises when not accompanied by real sector growth.

2.3 Evidence from India

In the Indian context, most research has concentrated on corporate and industrial credit. Studies by Pradhan et al. (2017) and Rath (2020) analyse the broader relationship between bank credit and economic growth, but rarely isolate the effects of personal loans. Chakraborty (2018) observes that although household credit in India has expanded rapidly, it remains weakly supported by a targeted policy framework. Recent data from the Reserve Bank of India (2023) indicate a structural shift in the credit landscape, with personal loans accounting for more than 30% of total bank credit and overtaking industrial lending. Despite this trend, empirical evidence on how such lending influences macroeconomic performance is still limited.

2.4 Research Gap

Although several studies have explored the relationship between bank credit and economic growth, most have focused on aggregate lending or on credit provided to the commercial and industrial sectors. Very few have examined personal loans as a distinct category of credit. Moreover, existing research rarely differentiates between the short-run effects of consumption-driven lending and its implications for long-run economic sustainability. In the Indian context, despite the rapid rise in personal lending, there is limited econometric analysis assessing its impact on GDP using advanced time-series methodologies.

2.5 Positioning of the Current Study

To bridge this gap, the present study employs the Autoregressive Distributed Lag (ARDL) framework using quarterly data to evaluate both the short-term and long-term effects of personal loans on India's GDP. The study contributes to the existing literature by:

- Examining personal loans as an independent credit component
- Distinguishing between short-run consumption-led growth and long-run sustainability
- Using a comprehensive ARDL-based model supported by diagnostic and stability tests

By doing so, the study provides fresh empirical evidence to inform ongoing discussions on whether consumer credit promotes or impedes sustainable economic development.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study employs a quantitative, empirical research design using quarterly time-series data to examine the dynamic relationship between personal loans and economic growth in India. The analysis is based on econometric modelling through the Autoregressive Distributed Lag (ARDL) framework, which allows for the assessment of both short-run and long-run interactions among the variables. The overall methodological approach is explanatory in nature, aiming to identify causal linkages between credit expansion—specifically personal loans—and GDP.

3.2 Research Objectives

- To analyse the short-run impact of personal loans on economic growth in India.
- To determine whether a long-run relationship exists between personal loans and economic growth.
- To examine the causal linkage between personal loans and GDP.
- To identify the policy implications of evolving credit allocation patterns in the Indian economy.

3.3 Data Source and Description

This study is based on secondary quarterly time-series data obtained from authoritative sources, including the Reserve Bank of India (RBI) and the Ministry of Statistics and Programme Implementation (MoSPI). Using quarterly data helps capture macroeconomic fluctuations more accurately and supports dynamic analysis within the ARDL framework.

Table 1: Variables Description

Variable	Type	Description
GDP	Dependent Variable	Real Gross Domestic Product
Personal Loans (PL)	Main Independent Variable	Total personal/household loans issued by banks
GFCF	Control Variable	Gross Fixed Capital Formation (indicator of investment activity)
Exports	Control Variable	Proxy for external sector performance
Inflation	Control Variable	Measure of domestic price stability
Exchange Rate	Control Variable	INR/USD exchange rate

The inclusion of multiple control variables helps reduce omitted variable bias and enables the study to capture the net effect of personal loans on GDP more accurately.

3.4 Construction of Variables

This section outlines the construction, transformation, and justification of each variable used in the analysis. All variables were converted into real terms and transformed into natural logarithms to ensure consistency, reduce heteroscedasticity, and enable elasticity-based interpration in the ARDL framework.

3.4.1 Real Gross Domestic Product (GDP)

Real GDP at market prices was selected as the primary indicator of economic growth. Quarterly data were sourced from MoSPI's National Accounts Statistics (2024), which report GDP under two different base years—2004–05 and 2011–12. Since changes in base years can introduce discontinuities, the two series were spliced

using the Link Relatives Method (Average Method) during the overlapping period (2011Q1–2014Q2) to generate a smooth and continuous time series.

The final dataset covers the period 2007Q1 to 2025Q1, corresponding to the availability of other macroeconomic variables used in the study. To stabilise variance and ensure that estimated coefficients can be interpreted as elasticities, the natural logarithm of GDP was computed as follows:

$$\log\_GDP_t = \ln(\text{Real GDP}_t)$$

This transformed variable serves as the dependent variable in the econometric model.

3.4.2 Personal Loans

Personal loans constitute the main explanatory variable in this study. Quarterly data were obtained from the Reserve Bank of India's Database on Indian Economy (DBIE) under the category "Sectoral Deployment of Bank Credit." As the RBI publishes these data monthly and in nominal terms, several adjustments were made to ensure consistency and suitability for time-series analysis.

Steps Followed

- Monthly personal loan figures were converted into quarterly averages.
- The series was deflated using the GDP implicit deflator to obtain values in real terms.
- The natural logarithm of the real series was computed as follows:

$$\log\_PL_t = \ln(\text{Real Personal Loans}_t)$$

- The final series spans from 2007Q1 to 2025Q1 to align with GDP and other macroeconomic variables.

This variable represents consumption-oriented household credit extended by the banking sector and serves as the primary indicator for examining the influence of personal borrowing on economic growth.

3.4.3 Gross Fixed Capital Formation (GFCF)

Gross Fixed Capital Formation (GFCF) was incorporated as a control variable to account for the role of investment-led growth in the economy. Quarterly data were obtained from MoSPI, reported at constant prices using the 2011–12 base year. To maintain continuity across different base-year revisions, the series was spliced using the same linking procedure applied to the GDP data.

Because the data were already available at constant prices, no additional deflation was required. The variable was transformed into its natural logarithmic form as follows:

$$\log\_GFCF_t = \ln(\text{Real GFCF}_t)$$

GFCF serves as a key indicator of long-term productive investment and helps capture the investment-driven transmission channel of economic growth.

3.4.4 Exports (Real Exports)

Exports were included to account for the role of external demand in influencing domestic economic activity. Quarterly real export data were obtained from MoSPI. Similar to GDP, the export series was harmonised across different base years using the Link Relatives Method to ensure continuity and comparability over time.

The transformed variable was expressed in natural logarithmic form as follows:

$$\log\_EXPO_t = \ln(\text{Real Exports}_t)$$

Incorporating exports into the model helps control for trade performance, international competitiveness, and fluctuations in global demand that may affect India's economic growth.

3.4.5 Inflation

Inflation was measured using the Wholesale Price Index (WPI), as it provides a consistent and uninterrupted dataset for the entire study period. Monthly WPI values were aggregated into quarterly averages and then spliced across base years using the same linking procedure applied to GDP. The resulting series captures domestic price movements that may influence consumption, investment, and overall economic activity.

3.4.6 Exchange Rate (INR/USD)

The bilateral INR/USD exchange rate was included to represent external financial conditions affecting the Indian economy. Daily reference rates from the Reserve Bank of India were first converted into month-end values and then averaged to obtain quarterly figures. To stabilise short-term volatility and allow elasticity-based interpretation, the natural logarithm of the series was computed as follows:

$$log\_EXR_t = \ln(INR/USD_t)$$

This variable helps control for external sector dynamics, including currency fluctuations and their potential influence on trade and investment flows.

3.4.7 Final Dataset

After converting all variables to real terms and transforming them into natural logarithms, a consistent quarterly dataset covering the period 2007Q1–2025Q1 was constructed. This dataset forms the basis for the ARDL modelling and causality analysis conducted in the study.

3.5 Econometric Strategy

3.5.1 Stationarity Testing

Given the time-series nature of the data, it was necessary to assess the stationarity properties of each variable. Augmented Dickey–Fuller (ADF) tests were employed to determine the order of integration. The results showed a mixed integration pattern, with some variables stationary at level I(0) and others at first difference I(1). As a result, traditional cointegration techniques such as the Johansen method—which require variables to be integrated of the same order—were not appropriate.

3.5.2 Justification for ARDL

The Autoregressive Distributed Lag (ARDL) model developed by Pesaran, Shin, and Smith (2001) was selected as the primary econometric framework for this study. The ARDL approach is well-suited to the data characteristics for several reasons:

- It accommodates variables that are integrated at different orders (I(0) or I(1)).
- It allows simultaneous estimation of both short-run and long-run relationships.
- It performs effectively with relatively small sample sizes.
- It incorporates the Bounds Testing procedure to determine the presence of long-run cointegration.

These features make the ARDL methodology an appropriate and robust choice for analysing the dynamic relationship between personal loans and economic growth.

3.5.3 ARDL General Model Structure

The general form of the ARDL model used in this study can be expressed as:

$$\text{GDP}_t = \alpha_0 + \sum_{i=1}^{p} \beta_i \, \text{GDP}_{t-i} + \sum_{j=1}^{q} \delta_j \, \text{PL}_{t-j}$$
$$+ \sum_{k=1}^{r} \theta_k \, \text{GFCF}_{t-k} + \sum_{m=1}^{n} \phi_m \, \text{EXPO}_{t-m} + \sum_{s=1}^{u} \psi_s \, \text{EXR}_{t-s}$$
$$+ \varepsilon_t$$

Where:

- **GDP_t** is the dependent variable (log of real GDP).
- **PL_t** represents personal loans—the key explanatory variable.
- **Control variables** include:
    - Gross Fixed Capital Formation (GFCF)
    - Exports (EXPO)
    - Inflation (INF)
    - Exchange Rate (EXR)
- **α_0** is the intercept term.
- **$\beta_i, \delta_j, \theta_k, \varphi_m, \psi_s$** are short-run dynamic coefficients.
- **ε_t** is the error term.

Lag lengths (*p, q, r, n, u*) are determined using model selection criteria such as the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), ensuring optimal model fit.

3.5.4 Error Correction Model (ECM) Framework

After confirming the existence of a long-run relationship among the variables through the Bounds Test, the Error Correction Model (ECM) is estimated to capture short-run dynamics and the speed at which the system returns to equilibrium. The ECM specification is given as:

$$\Delta \text{GDP}_t = \alpha + \sum_{i=1}^{p-1} \beta_i \, \Delta \text{GDP}_{t-i} + \sum_{j=0}^{q-1} \delta_j \, \Delta \text{PL}_{t-j} + \sum_{k=0}^{r-1} \theta_k \, \Delta \text{GFCF}_{t-k} + \sum_{m=0}^{n-1} \phi_m \, \Delta \text{EXPO}_{t-m} + \sum_{s=0}^{u-1} \psi_s \, \Delta \text{EXR}_{t-s}$$

Where:

- **Δ** represents first-differenced variables, capturing short-run changes.
- **ECT_{t-1}** is the lagged Error Correction Term, obtained from the long-run cointegrating equation.
- **λ** denotes the speed of adjustment coefficient, indicating how quickly GDP returns to long-run equilibrium after a short-term shock.
- A negative and statistically significant λ confirms valid long-run adjustment.

3.5.5 Diagnostic and Stability Testing

To ensure the robustness and reliability of the estimated ARDL model, a series of diagnostic and stability checks were conducted. These included:

- Tests for serial correlation
- Tests for heteroskedasticity

- Examination of residual normality
- Structural stability assessments using CUSUM and CUSUMSQ plots

Together, these procedures help verify that the model is free from specification errors and remains stable over the sample period, thereby supporting the validity of the economic inferences drawn.

3.6 Software Used

All estimations were carried out using Python-based statistical libraries, ensuring reproducibility and compliance with open research standards. Key packages included **statsmodels** for econometric modelling, **pandas** for data handling and transformation, and **matplotlib** for graphical visualisation and diagnostic analysis.

4. RESULTS AND ANALYSIS

4.1 Descriptive Statistics and Correlation Matrix

Table 1 presents the descriptive statistics for all variables used in the study, including measures of central tendency, dispersion, and normality (Jarque–Bera test). The variables are expressed in their logarithmic or real forms, consistent with the econometric framework.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Median	Maximum	Jarque –Bera	Probability
Personal Loans	14.0264	0.5345	13.3796	13.9635	15.0477	6.3111	0.0426
GDP	14.8658	0.322	14.2476	14.9024	15.4516	3.6876	0.1582
GFCF	13.7449	0.3218	13.1447	13.7255	14.3701	3.2504	0.1969
Exports	13.3465	0.3038	12.6894	13.3499	13.9236	1.5114	0.4697
Inflation	115.1871	23.7528	73.4572	113.8333	156.2667	2.0406	0.3605
Exchange Rate	4.1281	0.2262	3.6755	4.1684	4.4606	5.1037	0.0779

Interpretation

The descriptive statistics indicate that all variables exhibit reasonable variation and behave consistently over time, making them suitable for time-series analysis. Most variables show values that are normally distributed, as reflected in the Jarque–Bera probabilities, which are above the 5% level for the majority of the series. Although personal loans display slight deviation from normality, the overall dataset does not show any extreme fluctuations or irregular patterns. This suggests that the variables are statistically appropriate for further econometric modelling, including ARDL estimation and cointegration analysis.

Table 3: Correlation Matrix

Variables	PL	GDP	GFCF	Exports	Inflation	Exchange Rate
Personal Loans	1	0.954	0.947	0.903	0.931	0.926
GDP	0.954	1	0.985	0.956	0.946	0.955
GFCF	0.947	0.985	1	0.963	0.953	0.921
Exports	0.903	0.956	0.963	1	0.974	0.925
Inflation	0.931	0.946	0.953	0.974	1	0.938
Exchange Rate	0.926	0.955	0.921	0.925	0.938	1

Interpretation

The correlation results show strong positive relationships between all variables in the model. Personal loans are highly correlated with GDP, indicating that household credit tends to expand alongside overall economic activity. Investment (GFCF) and exports also show strong associations with GDP, reflecting their importance in supporting growth. Since most correlation values exceed 0.90, the variables exhibit high co-movement, suggesting possible multicollinearity. This supports the use of a dynamic approach like ARDL, which manages such correlations effectively and allows clearer identification of short-run and long-run effects.

4.2 Unit Root Test

Table 4: Unit Root Test (ADF) – Stationarity Results

Variable	ADF Level (t-stat)	p-value	ADF 1st Diff. (t-stat)	p-value	Order of Integration
GDP	-2.2387	0.4681	-5.1821	0	I(1)
Personal Loans	-2.4593	0.3486	-2.8413	0.0526	I(1)*
GFCF	-6.6783	0	-9.1091	0	I(0)
Exports	-2.9603	0.1435	-4.1081	0.0009	I(1)
Inflation	-2.2311	0.4724	-5.9194	0	I(1)
Exchange Rate	-2.3809	0.3898	-7.2173	0	I(1)

Note:

*Personal Loans show borderline stationarity at 5% (p = 0.0526), but are treated as I(1) based on economic justification.

I(0): Stationary at level; I(1): Stationary after first differencing.

Interpretation:

The ADF test results show that most variables—GDP, Personal Loans, Exports, Inflation, and Exchange Rate—become stationary only after first differencing (I(1)). GFCF is the only variable that is stationary at level (I(0)).

Since none of the variables are I(2), the ARDL model can be used. Personal Loans show borderline significance but are still treated as I(1). Overall, the mix of I(0) and I(1) variables justifies applying ARDL for further analysis.

4.3 Lag Length Selection

Table 5: Lag Selection Results (AIC vs BIC)

Criterion	Selected ARDL Model	Lag Structure (p, qPL, qGFCF, qEXP, qINF, qEXR)	Value
AIC	ARDL(4, 1, 4, 0, 0, 4)	(4, 1, 4, 0, 0, 4)	AIC = –369.60
BIC	ARDL(4, 1, 0, 0, 0, 4)	(4, 1, 0, 0, 0, 4)	BIC = –330.77

Interpretation

Both AIC and BIC criteria were used to select the optimal lag structure for the ARDL model. AIC chose a more detailed model, ARDL (4, 1, 4, 0, 0, 4), while BIC selected a simpler model, ARDL (4, 1, 0, 0, 0, 4). Since AIC is preferred for small sample sizes, the ARDL (4, 1, 4, 0, 0, 4) model was chosen for further analysis. This specification captures richer short-run dynamics and the delayed effects of personal loans, investment, and exchange rate movements on GDP.

4.4 Co-integration Analysis

Table 6: ARDL Bounds Test Results

Test Statistic	Value	Decision
F-statistic (Wald on lagged levels)	9.05	Cointegration exists
p-value	1E-06	Highly significant
t-statistic on lagged GDP	–5.72	Significant
Coefficient on lagged GDP	–0.583	Correct sign (negative)

Interpretation

The ARDL bounds test confirms the presence of a long-run relationship among the variables. The F-statistic (9.05) exceeds the upper critical bound, and the p-value is highly significant, providing strong evidence of cointegration. The negative and significant coefficient of the lagged GDP term further supports stable long-run adjustment. Overall, the results indicate that the variables move together over time and share a meaningful long-run equilibrium relationship.

Table 7: Critical Values (Pesaran et al., 2001 – Case III)

Significance Level	I(0) Lower Bound	I(1) Upper Bound
10%	2.26	3.35
5%	2.62	3.79
2.50%	2.96	4.18
1%	3.41	4.68

Interpretation

The ARDL bounds test confirms a long-run relationship between GDP and its explanatory variables. The computed F-statistic (9.05) is well above the 1% upper bound value (4.68), providing strong evidence of cointegration. The negative and significant coefficient of the lagged GDP term (–0.583) supports the presence of a valid error correction mechanism, meaning the system adjusts back to equilibrium when deviations occur. Overall, the results indicate that personal loans, investment, exports, inflation, and exchange rate move together with GDP in the long run. This confirms a stable long-run equilibrium and supports continuing with long-run ARDL estimation and short-run ECM analysis.

4.**5 Long-Run ARDL Estimates**

Table 8: Estimated Long-Run Coefficients

Variable	Long-Run Coefficient	Sign	Significance
Personal Loans	–0.077	Negative	Significant at 5%
GFCF	0.828	Positive	Highly significant (<1%)
Exports	0.054	Positive	Not significant
Inflation	–0.002	Negative	Marginal (≈10%)
Exchange Rate	0.554	Positive	Highly significant (<1%)

Interpretation

The long-run ARDL results show that different credit components influence economic growth in different ways. Personal loans have a negative and significant impact on GDP in the long run, indicating that consumption-oriented borrowing may reduce long-term economic stability. This supports earlier findings that rising household debt can suppress future spending and weaken productive capacity.

GFCF has a strong, positive, and highly significant effect on GDP, highlighting the importance of investment-driven credit for sustainable growth. The exchange rate also shows a significant positive influence, suggesting that currency movements may support growth through trade competitiveness or capital flows.

Inflation has a small negative long-run effect, pointing to mild price pressures. Exports, however, show no significant impact on GDP in the long run, suggesting that trade alone may not drive growth without strong domestic investment.

Overall, the results indicate that the growth impact of credit depends on how credit is used. While personal loans may boost short-term demand, they may hinder long-term economic expansion, whereas investment-led credit contributes positively to sustained growth.

4.6 Short-Run Dynamics – ECM Results

Table 9: Short-Run ARDL (ECM) Estimates

Variable	Coefficient	t-stat	p-value	Interpretation
ΔPL	0.167	2.54	0.014	Significant, positive
$\Delta GFCF$	0.462	16.24	0	Strongly positive
$\Delta GFCF_{t-3}$	0.144	2.77	0.008	Positive, lagged effect
ΔEXR	0.014	0.18	0.855	Not significant
ΔEXR_{t-1}	-0.252	-3.24	0.002	Significant, negative
ΔEXR_{t-2}	-0.295	-3.50	0.001	Significant, negative
ΔEXR_{t-3}	-0.207	-2.62	0.012	Significant, negative
ΔGDP_{t-1}	-0.304	-2.89	0.006	Adjustment from past changes
ΔGDP_{t-2}	-0.513	-6.80	0	Strong negative feedback
ΔGDP_{t-3}	-0.513	-5.94	0	Strong negative feedback
ECT (GDP_{t-1})	-0.583	-5.72	0	Speed of adjustment
PL_{t-1}	-0.045	-2.24	0.029	Long-run effect component
$GFCF_{t-1}$	0.483	4.65	0	Long-run effect component
EXR_{t-1}	0.323	5.03	0	Long-run effect component

Interpretation

The ECM results show that personal loans have a positive and significant impact on GDP in the short run, indicating that increased consumer credit boosts demand-driven economic activity. Investment (GFCF) has a strong and immediate positive effect, along with an additional positive lagged impact, reinforcing its key role in supporting productive capacity.

Exchange rate movements show significant negative effects in their lagged terms, suggesting that currency fluctuations may temporarily disrupt economic activity through trade and cost-related pressures.

The error correction term (ECT) is negative and highly significant, confirming a valid long-run adjustment mechanism. About 58% of any disequilibrium is corrected within one quarter, indicating a fast convergence toward long-run equilibrium. This supports the earlier evidence of cointegration.

Overall, the short-run dynamics suggest that while personal loans stimulate immediate growth, exchange rate instability and negative feedback from past GDP changes highlight the need for cautious credit expansion to avoid short-term volatility or debt-related risks.

4.7 Diagnostic and Stability Tests

Table 10: Diagnostic Test Results

Test	Statistic / Decision	Conclusion
Durbin–Watson	1.67 (within acceptable range 1.5–2.5)	No serial correlation
Breusch–Pagan (LM)	4.63, p = 0.201	No heteroskedasticity
Breusch–Pagan (F-test)	1.97, p = 0.098	Fail to reject H_0
CUSUM	Within bounds	Stable model
CUSUMSQ	Within bounds	Variance stability

Interpretation

The diagnostic tests confirm that the ARDL model satisfies all key econometric assumptions. The Durbin–Watson value of 1.67 falls within the recommended range of 1.5–2.5, indicating no serial correlation in the residuals. The Breusch–Pagan LM and F-tests both yield non-significant p-values, confirming that the residuals are homoskedastic and the model is free from heteroskedasticity.

The CUSUM and CUSUMSQ stability plots remain within the 5% critical bounds, demonstrating that the model is structurally stable over the sample period with no evidence of parameter shifts or structural breaks.

Overall, the diagnostic and stability results validate that the ARDL(4,1,4,0,0,4) model is statistically sound, well specified, and reliable for both short-run and long-run inference.

5. Conclusion and Policy Implications

5.1 Summary of Findings

This study examined whether personal loans contribute to sustainable economic growth in India using quarterly macroeconomic data within an ARDL-based econometric framework. The results show that personal loans have a positive and significant impact on GDP in the short run, indicating that consumer credit stimulates immediate demand and economic activity. However, the long-run effect of personal loans is negative, suggesting that reliance on consumption-driven borrowing may create debt-related pressures and undermine long-term economic stability.

In contrast, gross fixed capital formation (GFCF) exhibits strong and significant positive effects in both the short and long run, highlighting the importance of investment-oriented credit in supporting productive capacity

and sustainable growth. These findings underscore the need to balance short-term credit-driven consumption with long-term investment-led expansion to ensure stable economic performance.

Table 11: Summarised Results

Variable	Short-Run Effect	Long-Run Effect	Overall Impact
Personal Loans	Positive and significant	Negative and significant	Boosts short-term GDP but not sustainable in the long run
GFCF	Strong positive	Strong positive	Key driver of economic growth
Exports	Weak effect	Weak effect	Requires supportive policies to enhance contribution
Inflation	Mild negative	Weak negative	Needs monitoring to maintain price stability
Exchange Rate	Negative (short run)	Positive (long run)	Supports competitiveness over the long term

Interpretation

The summarised results show that personal loans stimulate short-term, consumption-driven growth but may hinder long-term economic performance if household debt expands faster than income. In contrast, investment-oriented credit (GFCF) consistently promotes growth in both the short and long run, underscoring its importance for sustainable development. Exports and inflation exhibit relatively weak effects, indicating the need for supportive policies and stable macroeconomic conditions. The exchange rate has mixed effects—negative in the short run but positive in the long run—suggesting benefits for long-term competitiveness.

Overall, the findings highlight the importance of shifting from consumption-based lending towards investment-focused credit allocation to ensure stable and sustainable economic growth.

5.2 Policy Implications

Based on the empirical findings, several policy implications emerge regarding credit allocation and financial stability in the Indian economy.

5.2.1 Shift Credit Allocation from Consumption to Productive Sectors

The negative long-run effect of personal loans on GDP suggests that consumption-oriented credit does not support sustainable economic development. Policymakers should gradually redirect credit flows toward productive and growth-enhancing sectors such as MSMEs, agriculture, manufacturing, infrastructure, innovation, and entrepreneurship.

Credit directed toward these sectors strengthens capital formation, improves productivity, and generates employment, thereby fostering long-term economic resilience.

5.2.2 Strengthen Household Debt Management

The rapid rise in personal loan volumes raises concerns about household indebtedness and repayment capacity. To maintain financial stability, a stronger regulatory framework is needed to encourage responsible borrowing practices. Policy measures may include debt-to-income ratio limits, improved credit scoring mechanisms, real-time monitoring of credit exposure, and wider financial literacy programs aimed at educating consumers about debt risks. Such initiatives can reduce default probabilities and reinforce the overall stability of the financial system.

5.2.3 Promote Fixed Capital Investment

The findings highlight that Gross Fixed Capital Formation (GFCF) is a key determinant of economic growth. To strengthen long-term productive capacity, the government and financial institutions should introduce policies that encourage sustained capital investment. These may include tax incentives, simplified lending procedures, subsidised interest rates, and expanded credit access for productive activities. Prioritising capital-intensive industries would further enhance the nation's overall productive efficiency and support sustainable growth.

5.2.4 Maintain Exchange Rate Stability

Exchange rate fluctuations play a crucial role in shaping external competitiveness and trade outcomes. The long-run results indicate that exchange rate stability positively contributes to GDP, underscoring the importance of maintaining a predictable currency environment. Policymakers should therefore emphasise strategic foreign exchange management, export-promotion initiatives, and improved trade facilitation measures. A stable exchange rate enhances investor confidence, reduces external vulnerability, and supports stronger economic performance.

5.3 Conclusion

Using quarterly macroeconomic data and an ARDL modelling framework, this study examined the short-run and long-run effects of personal loans on economic growth in India. The results show a clear distinction between immediate and long-term impacts. In the short run, personal loans positively influence GDP, consistent with the Keynesian notion that consumer credit boosts aggregate demand and economic activity. However, the long-run impact is negative and statistically significant, indicating that continued dependence on consumption-based borrowing may weaken economic resilience and create debt-related constraints on future growth.

These findings suggest that when household credit is not directed toward asset creation or productive investment, it may lead to rising debt-servicing burdens, reduced future consumption capacity, and increased financial vulnerability. In contrast, Gross Fixed Capital Formation (GFCF) shows strong positive effects in both the short and long run, reinforcing its role as a fundamental driver of sustainable economic expansion.

The presence of a significant and negative error correction term confirms rapid adjustment toward long-run equilibrium, while diagnostic tests—such as Durbin–Watson, Breusch–Pagan, and CUSUM/CUSUMSQ— validate the robustness, reliability, and structural stability of the ARDL model.

Overall, the evidence indicates that personal loans support short-term growth but do not contribute to long-term economic development. Policymakers should therefore prioritise credit allocation towards productive sectors rather than consumption-driven lending. A strategic shift toward investment-based credit—particularly in

manufacturing, MSMEs, infrastructure, and innovation—is essential for promoting sustainable economic development and ensuring long-term macroeconomic stability.

5.4 Future Research Directions

Based on the limitations of the present study, several avenues remain for future exploration. Further research may enhance the understanding of credit–growth dynamics in the following ways:

1. Disaggregated Analysis of Personal Loans

Personal loans encompass diverse categories such as housing, vehicle, education, and consumer durable loans. Future studies could examine these sub-components separately to determine whether different types of household credit contribute differently to economic growth—positively or negatively.

2. Financial Inclusion and Access to Credit

Evaluating credit growth solely on the basis of loan volume provides an incomplete picture. Future research may integrate indicators of financial inclusion, including bank branch density, digital banking utilisation, credit penetration ratios, microfinance accessibility, and levels of financial literacy. These variables can help assess whether credit expansion is inclusive, equitable, and supportive of broad-based development.

3. State-Level or Regional Panel Analysis

Significant regional variations may exist in credit distribution and economic performance across India. A panel dataset or panel ARDL model using state-level observations could uncover spatial differences in the credit–growth relationship and identify regional disparities in financial development.

4. Use of Non-Linear and Threshold Models

The impact of credit on growth may vary depending on economic conditions, indebtedness levels, or financial stability. Future research can apply non-linear approaches such as Threshold ARDL, Markov-Switching models, or Quantile Regression to evaluate whether the effects of personal loans differ across high-growth and low-growth phases.

5. Role of Economic and Policy Reforms

Major economic reforms—such as demonetisation, GST implementation, digital banking initiatives, and monetary policy interventions—may significantly influence credit behaviour and GDP dynamics. Incorporating policy dummy variables, structural break tests, or interaction terms could help capture these structural shifts more accurately.

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