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Mudra Loans and Digital Financial Awareness: A Micro-Economic Study of Entrepreneurial Growth in Maharashtra

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Abstract*—Schemes promoting financial inclusion, most notably the Pradhan Mantri Mudra Yojana (PMMY), have opened up collateral-free credit to a vast number of India's micro-entrepreneurs; however, whether digital financial awareness works alongside such credit access to spur enterprise growth has received little empirical attention at the state level, and Maharashtra specifically has been largely overlooked. This paper investigates how Mudra loan utilization, digital financial awareness, and entrepreneurial growth relate to one another, drawing on 384 micro-enterprise beneficiaries selected from six Maharashtra districts through a multistage stratified random sampling approach. Primary responses were gathered via a structured, pre-tested questionnaire and combined with secondary data sourced from the Reserve Bank of India, MUDRA, NABARD, and the Ministry of MSME. Analysis relied on descriptive statistics, Pearson correlation, multiple regression, and chi-square testing carried out in SPSS 26.0. The findings show that Mudra loan access and digital financial awareness each make a significant, positive, independent contribution to entrepreneurial growth, together accounting for 45.2 percent of the observed variance, and that the level of awareness is significantly linked to how effectively loans are put to use. The paper argues for embedding digital financial literacy training within the Mudra loan disbursement process*.

***Keywords*—** *Mudra Yojana; Digital Financial Awareness; Entrepreneurial Growth; Micro, Small and Medium Enterprises (MSMEs)*.

I. INTRODUCTION

For decades, India's approach to development has treated financial inclusion as a necessary foundation for broad-based economic growth, and the Pradhan Mantri Mudra Yojana (PMMY), launched on 8 April 2015, represented a major move in that direction. Run through the Micro Units Development and Refinance Agency (MUDRA), the scheme provides collateral-free institutional credit of up to ₹20 lakh to non-corporate, non-farm micro and small enterprises, structured into four tiers — Shishu (up to ₹50,000), Kishor (₹50,000–₹5 lakh), Tarun (₹5 lakh–₹10 lakh), and Tarun Plus (₹10 lakh–₹20 lakh) (Press Information Bureau [PIB], 2025). By 2026, the scheme had sanctioned more than 52 crore loans totalling roughly ₹32.61 lakh crore, with women making up close to 68 percent of all beneficiaries (India Brand Equity Foundation [IBEF], 2026; PIB, 2025).

Maharashtra, which hosts one of the country's largest MSME populations, stands sixth among Indian states in cumulative Mudra disbursement, at roughly ₹2.74 lakh crore (PIB, 2025). Even so, the state shows marked internal disparity: the industrially developed corridors of Pune and the Mumbai Metropolitan Region stand in sharp contrast to the comparatively credit-starved and less digitally connected districts of Marathwada and Vidarbha. Alongside this credit expansion, India's digital financial ecosystem has been developing quickly — the RBI's composite Financial Inclusion Index climbed from 64.2 in FY24 to 67 in FY25, propelled largely by improvements in the Usage and Quality sub-indices (News on Air, 2025; RBI, 2024). Yet state-level SLBC figures point to a growing share of non-performing Mudra assets, put at 22 percent in Maharashtra as of mid-2021 (Saha, 2021), suggesting a widening gap between how much credit is disbursed and how productively it is put to use.

Having access to credit is not, by itself, sufficient for entrepreneurial success. Whether borrowers can understand, adopt, and make effective use of digital financial tools — mobile banking, UPI, digital bookkeeping, online credit monitoring — increasingly shapes how borrowed capital is converted into business growth (Ozili, 2018; Pillai, 2024). This ability, referred to here as digital financial awareness (DFA), is likely to matter a great deal for first-generation and rural entrepreneurs, who constitute a sizeable portion of Mudra beneficiaries. Despite the scale of the scheme and the speed of digital finance adoption, there is still little micro-level empirical evidence connecting Mudra loan access, digital financial awareness, and entrepreneurial growth specifically within Maharashtra. Much of the existing PMMY literature relies on aggregate secondary data (Mahajan, 2019; Agarwal & Dwivedi, 2017) or focuses on other states (Vijaya & Swarupa, 2022; Gupta & Agarwal, 2023).This study aims to address that gap by conducting a primary, statistically sampled investigation of Mudra beneficiaries in six districts of Maharashtra.

II. REVIEW OF LITERATURE

2.1 Studies on Mudra Yojana and Entrepreneurship

Among the earliest state-specific assessments of PMMY, Mahajan (2019) traced steady growth in disbursement across the Shishu, Kishor, and Tarun categories in Maharashtra but pointed to uneven penetration across districts. Agarwal and Dwivedi (2017), reviewing the scheme's design, concluded that

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although it widened formal credit access for micro-entrepreneurs, oversight of how funds were actually used remained inadequate. Bhayana and Kumar (2020) looked at the scheme's contribution to entrepreneurship development and reported a positive link between loan uptake and self-employment generation, especially among first-generation entrepreneurs. Salgotra and Kumar (2021), drawing on data from Mudra beneficiaries, showed that access to finance meaningfully lowered poverty indicators and improved household income stability. Kalaiarasan and Panchalan (2024) reviewed disbursement performance across lending institutions and states and observed that public sector banks surpassed their targets, with Maharashtra ranking among the leading contributors to national financial-inclusion outcomes. Kumari et al. (2023) applied similar evidence to north-eastern India and confirmed MUDRA's positive role in MSME development, while Kumar (2019) and Aravindaraj and Bala (2018) reported comparable trends elsewhere, underscoring the scheme's relevance across the country even as its translation into enterprise growth remains regionally uneven.

2.2 Studies on Digital Financial Literacy and MSME Performance

A separate strand of research has treated digital financial literacy as a driver of MSME performance. Using total interpretive structural modelling, Pillai (2024) identified digital literacy as one of the key success factors shaping MSME performance in India. Vijaya and Swarupa (2022), studying 150 MSMEs in Telangana, found through regression and ANOVA that digital and financial literacy together significantly predicted firm performance. Gupta and Agarwal (2023) examined how registered Indian MSMEs adopted digital financial services and found that demographic factors significantly influenced adoption patterns. Taken together, this body of work positions digital financial literacy/awareness as a consistent predictor of enterprise-level financial outcomes, although few studies apply this lens specifically to Mudra loan beneficiaries, and none pair it with primary survey data from Maharashtra.

2.3 Financial Inclusion Frameworks and Entrepreneurial Growth

At a conceptual level, Sarma (2012) built the widely cited Index of Financial Inclusion around the dimensions of access, availability, and usage, a framework later operationalized in the RBI's own Financial Inclusion Index (RBI, 2024). Ozili (2018) argued that digital finance strengthens financial inclusion and stability by cutting transaction costs and extending the reach of formal financial services to underserved groups, a claim echoed in NABARD's (2023) documentation of rising digital penetration among microfinance-linked rural enterprises. Together, these frameworks indicate that entrepreneurial growth does not follow directly from credit access alone but is shaped by a borrower's capacity to operate within an increasingly digital financial system.

2.4 Research Gap

Three limitations emerge from this review. First, most PMMY-focused studies (Mahajan, 2019; Agarwal & Dwivedi, 2017; Kalaiarasan & Panchalan, 2024) draw on secondary, scheme-level disbursement figures rather than measuring individual-level entrepreneurial outcomes through primary instruments. Second, research on digital financial literacy and MSME performance (Pillai, 2024; Vijaya & Swarupa, 2022) is mainly concentrated in Telangana and other regions, with Maharashtra receiving little attention. Moreover, most of this research treats digital awareness separately from access to Mudra credit. Third, no study identified in this review jointly models Mudra loan access and digital financial awareness as predictors of entrepreneurial growth using a statistically determined, multistage-sampled primary dataset from Maharashtra. This study addresses these gaps by testing, empirically, the combined and separate effects of Mudra loan utilization and digital financial awareness on entrepreneurial growth among a representative sample of Maharashtra's Mudra beneficiaries.

III. Research Questions

RQ1: What level of digital financial awareness do Mudra loan beneficiaries in Maharashtra currently have?
RQ2: What socio-economic and demographic profile do Mudra loan beneficiaries in the state exhibit?
RQ3: To what extent has access to Mudra loans supported the entrepreneurial growth of micro-enterprises in Maharashtra?
RQ4: Does a significant relationship exist between digital financial awareness and how effectively Mudra loans are utilized?
RQ5: What key challenges do entrepreneurs face in accessing Mudra loans and digital financial services?
RQ6: Which policy measures could strengthen digital financial inclusion and the effectiveness of Mudra loans for entrepreneurial development in Maharashtra?

IV. Objectives of the Study

1. To assess the level of digital financial awareness among Mudra loan beneficiaries in Maharashtra.
2. To analyse how Mudra loan access and utilization affect the entrepreneurial growth of micro-enterprises.
3. To examine the relationship between digital financial awareness and effective utilization of Mudra loans.
4. To identify the main challenges entrepreneurs face in accessing and utilizing Mudra loans and digital financial services, and to propose policy measures.

V. Hypotheses of the Study

H01: Mudra loan access/utilization has no statistically significant impact on the entrepreneurial growth of beneficiaries in Maharashtra.
H02: Digital financial awareness has no statistically significant impact on the entrepreneurial growth of Mudra loan beneficiaries in Maharashtra.
H03: There is no statistically significant association between digital financial awareness level and effective utilization of Mudra loans among entrepreneurs in Maharashtra.

VI. Research Methodology

6.1 Research Design

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The study follows a descriptive-cum-analytical, cross-sectional design that combines primary survey data with secondary institutional sources, in line with established practice for socio-economic impact assessment (Kothari, 2004).

6.2 Population and Sample Size Determination

The population consists of active Mudra loan beneficiaries running micro and small enterprises across Maharashtra — a large population whose exact size is not known. Sample size was calculated using Cochran's (1977) formula for large populations, at a 95 percent confidence level and a 5 percent margin of error:

$$n = Z^2pq / e^2 = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2 = 384.16 \approx 384$$

The resulting target of 384 also matches the minimum sample size recommended by the Krejcie and Morgan (1970) table for large populations. To allow for an expected non-response/incomplete-response rate, 430 questionnaires were distributed between January and March 2026, producing 384 fully valid and usable responses (an 89.3 percent response rate), which formed the basis of the analysis.

6.3 Sampling Technique and Area Coverage

A multistage stratified random sampling technique was used. Six districts — Chhatrapati Sambhajinagar and Jalna (Marathwada), Pune and Nashik (Western Maharashtra), Nagpur (Vidarbha), and Mumbai Suburban (Mumbai Metropolitan Region) — were purposively chosen to reflect Maharashtra's principal economic regions. Within each district, Mudra beneficiaries were stratified by loan category (Shishu, Kishor, Tarun, Tarun Plus) and selected at random in proportion to the district-wise disbursement share reported by lead banks.

6.4 Data Collection Instrument

A structured questionnaire, pre-tested on 30 respondents (Cronbach's α = 0.84) and revised on that basis, was administered through in-person and digitally assisted interviews. It comprised four sections: (i) demographic and enterprise profile, (ii) details of Mudra loan utilization, (iii) a 12-item digital financial awareness scale, and (iv) a 9-item entrepreneurial growth scale covering sales growth, income growth, and employment generation — both scales measured on a 5-point Likert format (Nunnally, 1978).

6.5 Secondary Data Sources

Secondary information was drawn from RBI Financial Inclusion Index reports (RBI, 2021, 2024), MUDRA and PIB disbursement reports (MUDRA, 2025; PIB, 2025), NABARD's Status of Microfinance in India (NABARD, 2023), the Ministry of MSME Annual Report (2021), the Economic Survey of Maharashtra (Government of Maharashtra, 2025), and relevant coverage from Business Standard and IBEF.

6.6 Variables and Statistical Tools

Mudra Loan Utilization and Digital Financial Awareness serve as the independent variables, with Entrepreneurial Growth as the dependent variable. Data were processed in SPSS 26.0 using descriptive statistics, Cronbach's alpha reliability analysis, Pearson correlation, multiple linear regression, and a chi-square test of association between digital financial awareness level and effective loan utilization (Field, 2013).

VII. Data Analysis and Results

TABLE 1: Demographic and Enterprise Profile of Respondents (N = 384)

Category	Sub-category	Frequency	Percentage (%)
Gender	Male	219	57.0
	Female	165	43.0
Age Group	18–30 years	96	25.0
	31–40 years	141	36.7
	41–50 years	98	25.5
	Above 50 years	49	12.8
Education	Up to Secondary	87	22.7
	Higher Secondary	112	29.2
	Graduate	133	34.6
	Postgraduate & above	52	13.5
Area	Urban	218	56.8
	Rural	166	43.2
Mudra Loan Category	Shishu	131	34.1
	Kishor	148	38.5
	Tarun	79	20.6
	Tarun Plus	26	6.8
Enterprise Type	Trading	142	37.0
	Manufacturing	88	22.9
	Services	154	40.1

Source: Field Survey, 2026 (n = 384)

Table 1 shows a fairly balanced but male-skewed sample (57.0% male, 43.0% female), with the largest age cohort (36.7%) between 31 and 40 years — the phase typically associated with active enterprise expansion. Over 48 percent of respondents held a graduate degree or higher, and urban respondents (56.8%) marginally outnumbered rural ones. The Kishor category (₹50,000–₹5 lakh) was the most availed loan type (38.5%), followed by Shishu (34.1%), reflecting the still-nascent stage of most beneficiary enterprises.

TABLE 2: Reliability Statistics (Cronbach's Alpha)

Construct	No. of Items	Cronbach's Alpha (α)
Digital Financial Awareness	12	0.834
Entrepreneurial Growth	9	0.812
Overall Instrument	21	0.861

Source: Computed from Field Survey Data, 2026 (SPSS 26.0)

All constructs exceed the 0.70 threshold recommended by Nunnally (1978), confirming satisfactory internal consistency of the scales used.

TABLE 3: Descriptive Statistics of Study Variables

Variable	N	Mean	SD	Min	Max
Mudra Loan Utilization Effectiveness	384	3.71	0.68	1.00	5.00
Digital Financial Awareness	384	3.42	0.79	1.20	5.00
Entrepreneurial Growth	384	3.58	0.74	1.30	5.00

Source: Computed from Field Survey Data, 2026 (SPSS 26.0)

On the 5-point scale, mean scores above the scale midpoint (3.0) indicate moderately favourable perceptions across all three constructs. The comparatively lower mean for digital financial awareness (M = 3.42, SD = 0.79) relative to loan utilization effectiveness suggests a persistent digital-awareness

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gap, particularly among rural and older respondents, that has not kept pace with credit expansion.

TABLE 4: Pearson Correlation Matrix

Variable	1
1. Mudra Loan Utilization	1.000
2. Digital Financial Awareness	.478**
3. Entrepreneurial Growth	.512**

*Source: Computed from Field Survey Data, 2026 (SPSS 26.0). **Correlation is significant at the 0.01 level (2-tailed).*

All three variables are positively and significantly correlated. Entrepreneurial growth shows its strongest association with digital financial awareness ($r = .601$, $p < .01$), followed by Mudra loan utilization ($r = .512$, $p < .01$), indicating that awareness of digital financial tools may be an even stronger correlate of growth outcomes than loan access alone.

Table 5: The regression model is statistically significant and jointly explains 45.2 percent of the variance in entrepreneurial growth. Both predictors contribute significantly and independently: Mudra loan utilization ($\beta = 0.366$, $p < .001$) and digital financial awareness ($\beta = 0.334$, $p < .001$), with loan utilization showing marginally the stronger standardized effect.

The proportion of respondents reporting effective loan utilization rises sharply with digital financial awareness — from 45.8 percent among the low-awareness group to 83.7 percent among the high-awareness group — and the chi-square statistic confirms this association is statistically significant.

TABLE 5: Multiple Regression Results (Dependent Variable: Entrepreneurial Growth)

Predictor	B	SE	Beta (β)	t	Sig.
(Constant)	0.842	0.146	—	5.767	0.000
Mudra Loan Utilization	0.398	0.049	0.366	8.122	0.000
Digital Financial Awareness	0.312	0.045	0.334	6.933	0.000

Source: Computed from Field Survey Data, 2026 (SPSS 26.0)
Model Summary: $R = 0.672$, $R^2 = 0.452$, Adjusted $R^2 = 0.448$, $F(2, 381) = 157.32$, $p < 0.001$.

TABLE 6: Chi-Square Test of Association: Digital Financial Awareness Level × Effective Mudra Loan Utilization

DFA Level	Effective Utilization — Yes	Effective Utilization — No	Total
Low (n = 83)	38 (45.8%)	45 (54.2%)	83
Medium (n = 178)	121 (68.0%)	57 (32.0%)	178
High (n = 123)	103 (83.7%)	20 (16.3%)	123
Total	262	122	384

Source: Computed from Field Survey Data, 2026 (SPSS 26.0). $\chi^2 = 42.174$, $df = 2$, $p < 0.001$.

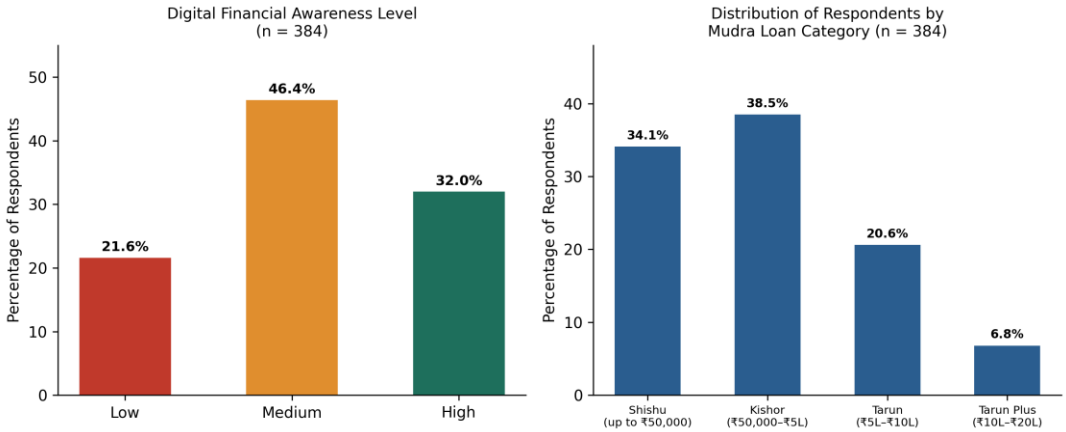


Figure 1: Distribution of Respondents by Digital Financial Awareness Level and Mudra Loan Category
Source: Field Survey, 2026 (n = 384)

7.1 Hypothesis Testing Summary

H01 is rejected: Mudra loan utilization exerts a statistically significant positive effect on entrepreneurial growth ($\beta = 0.366$, $t = 8.122$, $p < .001$).

H02 is rejected: Digital financial awareness exerts a statistically significant positive effect on entrepreneurial growth ($\beta = 0.334$, $t = 6.933$, $p < .001$).

H03 is rejected: Digital financial awareness level is significantly associated with effective Mudra loan utilization ($\chi^2 = 42.174$, $df = 2$, $p < .001$).

VIII. Findings

- Close to half the sample (46.4%) reported a medium level of digital financial awareness, while only 32.0 percent reported high awareness — evidence that awareness has lagged behind the pace of loan disbursement.
- Kishor (38.5%) and Shishu (34.1%) loans account for most of the sample, indicating that the majority of beneficiaries remain at an early stage of enterprise scaling.
- Mudra loan utilization and digital financial awareness each significantly and independently predict entrepreneurial growth, together explaining 45.2 percent of its variance.
- Digital financial awareness correlates more strongly with entrepreneurial growth ($r = .601$) than loan utilization does ($r = .512$), pointing to its outsized role in converting credit into business outcomes.
- Effective loan utilization is significantly tied to awareness level, with high-awareness beneficiaries nearly twice as

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likely to report effective utilization as low-awareness beneficiaries.
- Rural and older respondents show comparatively lower digital financial awareness scores, indicating a persistent digital divide within the beneficiary population.

IX. Discussion

These findings both support and build on the existing literature in two respects. First, in line with Bhayana and Kumar (2020) and Salgotra and Kumar (2021), Mudra loan access emerges as a significant driver of entrepreneurial outcomes in Maharashtra, reaffirming the scheme's function as a tool of grassroots financial inclusion. Second, and more notably, this study extends the digital-financial-literacy–MSME performance literature (Pillai, 2024; Vijaya & Swarupa, 2022; Gupta & Agarwal, 2023) — previously concentrated outside Maharashtra — by showing that digital financial awareness functions not as a peripheral enabler but as a comparably strong, independent predictor of entrepreneurial growth among Mudra beneficiaries specifically. This is consistent with Ozili's (2018) theoretical claim that digital finance enhances the effectiveness, not just the reach, of financial inclusion.

The significant link between awareness level and effective loan utilization (H03) suggests that disbursing credit without accompanying digital financial capability-building may fall short of its entrepreneurial potential — a pattern that aligns with the rising trend in Mudra non-performing assets reported for Maharashtra (Saha, 2021) and with Sarma's (2012) broader argument that financial inclusion is multidimensional, involving usage and quality as well as access. The comparatively lower awareness recorded among rural and older respondents echoes NABARD's (2023) findings on uneven digital penetration in rural microfinance-linked enterprises, reinforcing the case for interventions tailored by region and demographic group rather than a single, scheme-wide approach.

X. onclusion and Policy Implications

This study set out to examine how Mudra loan access and digital financial awareness jointly influence entrepreneurial growth among 384 beneficiaries across six districts of Maharashtra. The results show that both factors significantly and independently predict entrepreneurial growth, and that digital financial awareness is significantly linked to how effectively loans are utilized. These findings suggest that the entrepreneurial impact of the Pradhan Mantri Mudra Yojana in Maharashtra could be considerably strengthened by pairing credit disbursement with structured digital financial literacy interventions, rather than treating credit access and digital capability-building as separate policy tracks.

Specific policy implications include: (i) mandatory, bank-linked digital financial literacy modules at the point of Mudra loan sanction, particularly for Shishu and Kishor category borrowers; (ii) targeted digital-awareness campaigns for rural and older beneficiaries in Marathwada and Vidarbha, where awareness levels lag; (iii) periodic post-disbursement monitoring that tracks digital-tool adoption alongside repayment performance to pre-empt non-performing assets; and (iv) closer convergence between PMMY implementation and existing digital literacy schemes run by NABARD and the Ministry of MSME. Such integration would help convert India's expanding credit infrastructure into more consistent and sustainable entrepreneurial outcomes.

XI. Limitations and Scope for Further Research

This study is limited to six districts of Maharashtra and relies on self-reported, perceptual measures of entrepreneurial growth rather than audited financial records, which may introduce common-method bias. Future research could draw on longitudinal panel data, objective enterprise performance indicators, and comparative cross-state designs to further test and generalize the relationships observed here among digital financial awareness, Mudra loan utilization, and entrepreneurial growth.

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