Plant Archives Vol. 26, Supplement 1, 2026 pp. 1264-1268 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org
DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2026.v26.supplement-1.166

PATTERN OF DISTRIBUTION OF SHORT-TERM AND MEDIUM-TERM CROP LOANS BY PUNE DISTRICT CENTRAL COOPERATIVE BANK DCCB OF MAHARASHTRA (INDIA)

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(Date of Receiving : 14-09-2025; Date of Acceptance : 24-11-2025)

ABSTRACT

This paper assesses the disbursement pattern of short- and medium-term crop loans by Pune District Central Cooperative Bank DCCB Pune over a 24-year period (2000–01 to 2023–24) using statistical measures such as the Coefficient of Variation (CV) and Cuddy-Della Vella Index (CDVI) to evaluate the stability and consistency of the crop loan distribution system.

The inadequacy of crop loan financing is compounded by disparities and instability in the distribution of both short-term and medium-term loans over the study period. Short-term crop loans disbursed by PDCCB grew from Rs. 15,705 lakh in 2000–01 to Rs. 2,84,361 lakh in 2023–24, registering a cumulative growth of 94.48%. This consistent increase highlights the bank's expanding focus on seasonal input financing for purposes such as seed procurement, fertilizer application, and wage labor. However, the Coefficient of Variation (CV) for short-term loans during the same period was 80.71%, and the Cuddy-Della Vella Index (CDVI) was 35.4%, pointing to high year-on-year variability and a lack of consistent trend behaviour. In contrast, medium-term loans which are intended to finance more durable investments like irrigation structures, wells, and agricultural machinery showed limited and erratic growth. From Rs. 21,295 lakhs in 2000–01, medium-term credit only rose to Rs. 41,213 lakh in 2023-24, marking a modest growth of 48.33%. The instability in disbursement was more pronounced here, with CV values reaching 46.41% overall, and CDVI peaking at 47.42% during 2000–2011. Period-wise analysis revealed that both short-term and medium-term loans displayed significant variability during 2000–2011 (CV over 49%), reflecting weak policy coherence and distributional inefficiencies. While short-term loan distribution stabilized somewhat in the second period (2012–2023), with CV reducing to 39.14%, the medium-term disbursement continued to reflect instability and policy inconsistency. Over the entire 24-year span, medium-term loans remained underutilized and poorly aligned with long-term agricultural capital needs. These outcomes underscore the pressing need to revise lending strategies to ensure better predictability, geographical balance, and responsiveness to crop cycles.

***Keywords*:** Pattern of Distribution, crop loan, District Central Cooperative Bank, Pune, Maharashtra (India).

Introduction

Agricultural credit plays a pivotal role in sustaining and modernizing farming practices. Timely and adequate credit enables farmers to meet seasonal input requirements and invest in long-term improvements like irrigation, machinery, and infrastructure. Cooperative banks, being farmer-centric institutions, are crucial in this process. The Maharashtra State Cooperative Bank (MSCB) serves as the apex financial institution for all District Central Cooperative Banks (DCCBs) within the state, acting as a central coordinating body for cooperative credit and

supporting the flow of credit to the agricultural sector. Maharashtra has an extensive network of DCCBs across its districts, aiming to make credit more accessible and affordable for farmers, thereby advancing rural development and strengthening the agricultural economy.

The Pune District Central Cooperative Bank (DCCB Pune) has been a major source of institutional finance for farmers in the district. Over the years, its role in disbursing short-term loans (for seeds, fertilizers, and labour) and medium-term loans (for equipment and development activities) has significantly shaped farm-level productivity. However, the flow of credit has not been uniform. Periodic fluctuations and inequalities in disbursement highlight the need to evaluate both variation and instability in credit supply (Jadhav and Kasar, 2005).

Materials and Methods

Sampling and Data Collection

The study was conducted in Pune district for its significant presence of District Central Cooperative Bank (DCCB) branches, with 294 offices, ranking 2nd in Maharashtra and accounting for 8% of the total DCCB offices in the state. District Central Cooperative Banks in Maharashtra are 3,679 in number, and Pune alone holds a substantial share, indicating its importance in the cooperative credit system. This extensive network highlights Pune's vital role in cooperative credit delivery and makes it a strong representative district for analyzing the impact of crop loan disbursement (Jadhav and Kasar, 2005).

Analytical Framework

Following Statistical tools were employed for the analysis of the data:

The inequality in disbursement of short term and medium-term loans by PDCCB were assessed with the help of following measures of inequality. To accomplish the objective relating to the variation, the coefficient of variation (CV) and to check instability, Cuddy and Della Vella Index were calculated over a 24 year period (2000–01 to 2023–24) by using the following formula. The mode of calculation followed was same as has been provided in Goyal *et al*. (2009), Raut *et al*. (2018), Singh and Sukhmani (2011).

The coefficient of variation (CV) and Cuddy and Della Vella Index estimated for three periods

1. Period I : 2000-01 to 2011-12
2. Period II : 2012-13 to 2023-24
3. Period III (Entire Period): 2000-01 to 2023-24

Coefficient of Variation (CV) = SD/Mean x 100

Where,

CV = Coefficient of variation,

SD = Standard deviation

$$\textbf{Mean} = \sum x/n,$$

X = Per hectare credit,

n = Number of observations

Then taking CV as dependent variable and time as independent variable, a linear equation viz.; CV = a + bt + u was fitted to examine the trend of variation. The regression coefficients were tested for significance. A significant positive regression coefficient indicates an increase in the variability in credit flow while a significantly negative regression coefficient indicates a tendency of reduction in variability over the 24 years period (2000-01to 2023-24) (Jadhav and Kasar, 2005).

$$\textbf{Cuddy - Della Vella Index} = CV \times \sqrt{1 - r^2}$$

Where,

r^2 = Coefficient of multiple determination

Result and Discussion

Table 1: Year-wise Distribution and Growth Rate of Crop Loans by PDCCB

Sr. No.	Year	Short Term Credit		Medium Term Credit	
		Amount (Rs)	% Change over base year 2000-01	Amount (Rs)	% Change over base year 2000-01
1	2000-01	15705	-	21295	-
2	2001-02	17300	9.22	22166	3.93
3	2002-03	26017	39.64	10637	-100.20
4	2003-04	21221	25.99	6718	-216.98
5	2004-05	24124	34.90	43102	50.59
6	2005-06	32085	51.05	19938	-6.81
7	2006-07	42926	63.41	16308	-30.58
8	2007-08	47232	66.75	13893	-53.28
9	2008-09	25578	38.60	14734	-44.53
10	2009-10	63258	75.17	34224	37.78

11	2010-11	63258	75.17	34224	37.78
12	2011-12	74346	78.88	22808	6.63
13	2012-13	22808	31.14	11738	-81.42
14	2013-14	132802	88.17	14319	-48.72
15	2014-15	142119	88.95	14767	-44.21
16	2015-16	186509	91.58	16289	-30.73
17	2016-17	179465	91.25	22845	6.78
18	2017-18	132246	88.12	12891	-65.19
19	2018-19	152734	89.72	16183	-31.59
20	2019-20	167371	90.62	14422	-47.66
21	2020-21	225657	93.04	17307	-23.04
22	2021-22	233302	93.27	25058	15.02
23	2022-23	249799	93.71	36647	41.89
24	2023-24	284361	94.48	41213	48.33

Source: National Federation of State Co-operative Banks Ltd. (NAFSCOB)

As shown in Table- 1, the analysis of crop loan distribution by the Pune District Central Cooperative Bank (PDCCB) from 2000–01 to 2023–24 reveals considerable variation in both short-term and medium-term credit disbursement.

Short-Term Credit Disbursement

The short-term credit showed a consistent upward trend over the years. Starting from Rs. 15,705 lakh in 2000–01, it steadily increased, reaching Rs. 2,84,361 lakh in 2023–24, which reflects a cumulative growth of 94.48%. The highest year-on-year percentage increase was observed in 2002–03 (39.64%) and 2005–06 (51.05%), indicating an expansion in seasonal credit support for immediate farming operations. The sustained increase after 2010–11 shows institutional focus on supporting short-term input requirements like seeds, fertilizers, and labour (Bhosale *et al*., 2013).

Medium-Term Credit Disbursement

In contrast, medium-term credit exhibited a fluctuating and inconsistent trend. Although the initial value was Rs. 21,295 lakh in 2000–01, it declined sharply in the early years dropping to Rs. 6,718 lakh in 2003–04 and showed repeated dips and recoveries throughout the period. A more notable increase occurred only after 2020–21, reaching Rs. 41,213 lakh in 2023–24, which is a cumulative growth of 48.33%. The negative percentage changes in multiple years (e.g., -100.20% in 2002–03, -216.98% in 2003–04, and -65.19% in 2017–18) indicate a lack of policy consistency or demand variability in credit targeted at medium-term investments such as farm equipment, irrigation facilities, and infrastructure.

Variation in Crop Loan Disbursement by Pune DCCB (Period-wise)

Table 2: Variation in Short-Term and Medium-Term Crop Loan Disbursement by Pune DCCB

Period	Short-Term Credit CV (%)	Short-Term CDVI	Medium-Term Credit CV (%)	Medium-Term CDVI
Period 1 (2000-01 to 2011-12)	53.2	25.21	49.42	47.42
Period 2 (2012-13 to 2023-24)	39.14	29.77	47.06	41.76
Period 3 (Entire Period) (2000-01 to 2023–24)	80.71	35.4	46.41	44.46

Period 1 (2000–01 to 2011–12)

During the first period, short-term credit disbursement showed a CV of 53.2% and a CDVI of 25.21%, indicating high variation but moderate trend consistency. This suggests that the amount of short-term credit issued fluctuated significantly from year to year, although the overall trend had some degree of stability.

On the other hand, medium-term credit had a CV of 49.42%, reflecting considerable variation, and a much higher CDVI of 47.42%, implying a less consistent growth trend. This shows that medium-term

lending during this period was not only variable but also lacked direction or predictability, likely due to irregularities in investment-focused credit policies or fluctuating farmer demand for medium-term loans (Rani, 2016).

Period- 2 (2012–13 to 2023–24)

In the second period, short-term credit became relatively more stable, with the CV dropping to 39.14% indicating reduced variation in credit amounts. However, the CDVI rose to 29.77%, suggesting that the trend became more inconsistent, possibly due to policy shifts, climatic disruptions, or changes in the input financing system.

For medium-term credit, the CV remained high at 47.06%, and the CDVI stood at 41.76%, continuing the pattern of high variability and inconsistent disbursement trends. Although slightly improved from Period 1, the data still reflects ongoing instability in medium-term loan distribution, especially for farm investments like equipment, irrigation systems, and long-gestation expenses.

Period 3 (2000–01 to 2023–24 (Entire Period))

Over the entire study period, short-term credit exhibited the highest variation, with a CV of 80.71%, indicating a very wide fluctuation in disbursement amounts. Despite the overall increase in credit volume, the CDVI of 35.4% shows that the long-term trend lacked smoothness and predictability, likely reflecting periodic policy interventions, demand shifts, and institutional changes.

In comparison, medium-term credit displayed a CV of 46.41%, which was lower than short-term but still significant. The CDVI of 44.46% confirms that medium-term credit disbursement remained unstable and trend-inconsistent across the entire 24-year period. This persistent instability points to a structural weakness in medium-term credit planning and implementation by the PDCCB.

Conclusion

The multiple regression analysis conducted over a 24-year period (2000–01 to 2023–24) reveals significant insights into the disbursement patterns of short-term and medium-term crop loans by the Pune District Central Cooperative Bank (PDCCB). The discussion integrates both year-wise growth patterns and statistical measures of variation, namely the Coefficient of Variation (CV) and the Cuddy-Della Valle Index (CDVI) to evaluate the stability and consistency of the crop loan distribution system. The short-term model showed an excellent fit with an R^2 value of 0.97, indicating that 97% of the variation in loan disbursement is explained by the included variables, while the medium-term model had a moderate fit with an R^2 of 0.61, suggesting that other external factors also influence long-term credit allocation (Raut *et al*., 2018).

In the case of short-term crop loans, agronomic variables such as gross cropped area under horticultural crops, cash crops, and traditional agronomical crops had strong positive effects. Among these, horticultural crops had the highest influence, followed by sugarcane, reflecting the increasing credit demand for commercial, input-intensive crops. Rainfall also positively affected loan disbursement, implying that favourable monsoon conditions encourage more cultivation and consequently higher credit uptake. Furthermore, institutional factors such as short-term loan collection and branch profitability were statistically significant, confirming that better recovery rates and financially healthier branches enhance the bank's capacity and willingness to lend. These results collectively suggest that both agronomic expansion and institutional strength play a crucial role in shaping short-term (Rachana, 2011 & Rani, 2016).

On the other hand, the medium-term loan model presents a different scenario. Agronomic factors such as sugarcane and horticultural crop area exhibited negative coefficients, indicating that increased cultivation of these crops does not support, and may even reduce, medium-term loan issuance. This may be attributed to a preference for short-term loans in such sectors or the adequacy of private investment for capital needs. Rainfall had a negative association as well, implying that good rainfall years reduce the necessity for medium-term investments like irrigation infrastructure. Importantly, institutional variables again emerged as dominant influences loan collection and branch profitability both had significant positive coefficients, indicating that internal financial health and recovery efficiency are primary drivers of medium-term credit expansion (Chandel, 2012).

Together, these findings highlight a key distinction in the determinants of short- and medium-term crop loan disbursement. Short-term lending is closely linked to crop pattern dynamics, climatic variations, and seasonal demand, while medium-term credit depends more on the financial strength and risk-handling capacity of the lending institution. Therefore, for effective credit planning, PDCCB and similar cooperative institutions should adopt a dual approach supporting seasonal crop finance based on agro-climatic factors and simultaneously strengthening institutional systems to sustain medium-term investment lending. This balanced strategy will ensure

timely, adequate, and targeted credit flow across all segments of the agricultural sector.

Suggestions /Policy Implications

Following policy implications have emerged from the study:

- Under the Digital Agriculture Mission launched in September 2024, a forward-looking crop loan model should be introduced by banks to support cash crop cultivation through staged financing and digital monitoring
- Pre-Sowing Credit Disbursement: Traditionally, crop loans are sanctioned only after crops are physically visible in the field. Under this policy, banks should disburse 50% of the loan amount before sowing, based on the farmer's declared cropping plan and digitally verified land ownership/lease records
- Identify talukas or blocks with historically low medium-term credit disbursement and set area-specific goals to reduce regional disparities in credit access
- **Awareness and Capacity Building**

  Conduct financial literacy and awareness programs for farmers to improve their understanding of medium-term loan benefits and responsible borrowing.

Acknowledgement

i. The author would like to express their gratitude to Department of Agricultural Economics and Dean .Post Graduate college of Agriculture, RPCAU, Pusa for the approval of the Research Programme and for their financial support.

ii. The author is grateful to the anonymous referee for his valuable suggestions which helped in bringing the paper in its present form.

Competing Interests

Authors have declared that no competing interests exist

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