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Assessing the Role of Direct Benefit Transfer Schemes in Promoting Financial Inclusion: Evidence from Himachal Pradesh, India

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Abstract

Financial inclusion is widely seen as a major contributor to inclusive economic growth, poverty alleviation, and household resilience, especially in rapidly developing digital economies. Direct Benefit Transfer (DBT) in India, introduced through the Jan Dhan-Aadhaar-Mobile (JAM) program, has radically transformed welfare delivery by directly depositing government benefits into beneficiaries' bank accounts. Whereas national data indicate substantial growth in access to finance, there have been few empirical studies of the behavioural implications of participating in DBT at the regional level. This paper assesses the importance of DBT schemes in promoting financial inclusion for households in Himachal Pradesh, India. A composite Financial Inclusion Index is built from primary survey data collected in 2023-24, covering account ownership, account usage, digital transaction adoption, and DBT receipt. Descriptive statistics, Chi-square tests, binary logistic regression, and ANOVA at the district-level are used in the empirical analysis. The findings indicate widespread access to finance: 91.2% of participants have bank accounts, and 83% report using them regularly. DBT participation is significantly related to account activity and the adoption of digital payments, with beneficiaries more likely to be financially included than twice as often. Nevertheless, the different levels at the district level show that inclusion results are mediated by infrastructure and digital network access. The results indicate that DBT is a structural driver of behavioural financial inclusion, but long-term gains require additional investment in digital infrastructure and financial literacy.

Keywords: Direct Benefit Transfer; Financial Inclusion; Digital Public Infrastructure; Digital Payments; Behavioural Banking

Introduction:

Inclusion in the field of finance has become the key to inclusive economic growth and social welfare policy in the emerging economies. It does not imply access only to formal financial services, but also their effective and sustained use to save, make payments, take on credit, and manage risks. Being highly developed, the financial system helps households deal with economic uncertainty, engaging in economically productive activities, and enhancing general welfare outcomes (Allen et al., 2016; Greenwood et al., 2013). There is empirical evidence that increased access to financial services reduces poverty, stabilizes incomes, and promotes economic sustainability, especially for vulnerable groups (Demirguc-

Kunt et al., 2018; Ghosh, 2021). Nevertheless, even though significant advancements have been made in expanding financial access, many developing economies still face structural obstacles, including financial literacy, institutional coverage, and technological infrastructure (Ozili, 2021; Khan et al., 2022). The increasing use of digital technology has altered the financial inclusion landscape by lowering the transaction costs and making access to financial services easier. Digital payment platforms, mobile banking, and identity-based financial systems have increased access to financial institutions, especially in areas with little physical banking systems (Jack and Suri, 2014; Sahay et al., 2020). Moreover, a digital public infrastructure, such as an interoperable payment system and digital identity platforms, has enhanced financial engagement by enabling secure, efficient transactions (D'Silva et al., 2019; Khera et al., 2022). According to the Global Findex Database, global growth in account ownership and the use of digital payment methods has surged considerably, especially during COVID-19, when the latter was instrumental in providing government aid (Demirguc-Kunt et al., 2022; World Bank, 2022). To achieve financial inclusion, government-to-person transfer programmes have become policy tools that combine welfare delivery systems with formal financial systems. Mobile money transfer experiments demonstrate that digital payment systems enhance efficiency, reduce administrative leakage, and encourage beneficiaries to use formal financial systems (Aker et al., 2016). On the same note, digital welfare programmes have been reported to enhance institutional trust and enhance transparency in public spending (Banerjee et al., 2020; Gelb and Mukherjee, 2020). Such programmes facilitate behavioural interaction with financial institutions by creating regular financial transactions and limiting the number of inactive accounts.

India has been using a combination of approaches to financial inclusion, based on institutional reforms and digital governance. The Jan Dhan-Aadhaar-Mobile (JAM) framework is an overarching policy framework that integrates banking outreach, biometric identification, and mobile connectivity to enable the direct transfer of state benefits (Government of India, 2024). In 2013, a new system called the Direct Benefit Transfer (DBT) was implemented to make the welfare delivery process more efficient by transferring subsidies directly into beneficiaries' bank accounts. The policy is intended to ensure greater targeting accuracy, reduce corruption, and promote participation in formal financial systems (Joy, 2018; Yadav, 2014).

Empirical studies also yield mixed results on the role of DBT in financial inclusion outcomes. According to some studies, digital transfers have a significant positive effect on account utilization and reduce leakages in welfare programmes (Muralidharan et al., 2016; Banerjee et al., 2017). DBT programmes are also believed to be linked to increased transparency and better delivery of governmental benefits (Sabherwal et al., 2019). There are still difficulties, though, related to sustaining financial involvement, especially in rural and geographically remote areas where

infrastructure is constrained, and access to banking services is limited (Asian Development Bank, 2021; International Monetary Fund, 2021).

Other recent studies highlight that behavioural outcomes are essential in measuring financial inclusion and not account ownership. The frequency of account usage, the presence of digital transactions, and trust in institutions are becoming the most apparent indicators of significant financial involvement (Allen et al., 2016; Siddika et al., 2023). Digital welfare transfer can also support the development of such behavioural outcomes because it introduces beneficiaries to the financial systems and supports the tendency to recurrent interaction with formal institutions (Dar et al., 2023). However, these interventions should be supported by such factors as financial literacy, digital readiness, and institutional capacity to be effective (Khan et al., 2022).

Although there is increased evidence on this at the national level, there is a paucity of research on the behavioural impacts of DBT programmes at the regional or subnational level. The available body of research can be largely classified as aggregate indicators, which tend to conceal local changes in financial participation. Such a gap is especially relevant in geographically diverse areas like Himachal Pradesh, where mountainous landscapes, scattered populations, and limited infrastructure can limit access to financial services (Reserve Bank of India, 2023). Though government programmes like the Pradhan Mantri Mudra Yojana and DBT programmes have increased financial access in villages, there is still limited empirical evidence on whether these programmes are effective in ensuring sustainable financial inclusion (Singh, 2020).

The current research helps fill this gap by focusing on how Direct Benefit Transfer schemes can enhance financial inclusion among households in Himachal Pradesh. As opposed to the past studies that have highlighted more on access indicators, this study considers the two dimensions of financial inclusion, access-based and behavioural ones that comprise account ownership, frequency of account use, adoption of digital transactions, and institutional trust.

The study finds the following hypothesis based on the theoretical and empirical literature:

H1: Direct Benefit transfer scheme participation has a positive correlation with an increased measure of financial inclusion of beneficiary households.

The study will seek the following objectives in order to test this hypothesis:

1. To evaluate the level of financial inclusion among households that receive Direct Benefit Transfer benefits in Himachal Pradesh.
2. To test the correlation between the indicators of behavioural financial inclusion and participation in DBT.
3. To estimate the socioeconomic and regional factors that affect the results of financial inclusion.
4. To assess the difference in district-level financial inclusion and DBT participation.

The study will be useful for the literature on digital financial inclusion, the

effectiveness of public policy, and the welfare delivery system in emerging economies by providing household-level data from a geographically distinct area. The results will be useful to policymakers in their efforts to reinforce financial inclusion via digital governance programs and by building specific infrastructure

Conceptual Framework:

To test the association between Direct Benefit Transfer (DBT) participation and financial inclusion, the research develops a conceptual model outlining the behavioural and structural mechanisms through which welfare transfers can affect financial participation. The scheme presumes that the DBT programs will foster financial inclusion by encouraging beneficiaries to engage more with formal financial institutions, use digital means to access financial services, and build trust in institutional forms of welfare provision. DBT participation is, in theory, legally mandated as the main policy intervention that determines financial inclusion outcomes, as shown in Figure 1. This relationship is observed across three main channels of behaviour according to the framework. First, DBT transfers promote banking services by creating recurring financial transactions that lead to account ownership and use. Secondly, exposure to online welfare remittance will facilitate the implementation of electronic financial services such as mobile-based and digital payment systems. Third, regular and consistent transfer systems build institutional confidence in digital financial systems, which, in turn, increases continued use of formal financial services. All the above behavioural outcomes lead to broader financial inclusion, as indicated by both structural access to financial services and active participation in financial activities. The framework is based on the behavioural financial inclusion perspective and the digital public infrastructure approach that highlight the idea that policy-oriented financial relations can empower long-term financial participation when relying on repeated interaction with the institutional systems (Allen et al., 2016; Khera et al., 2022).

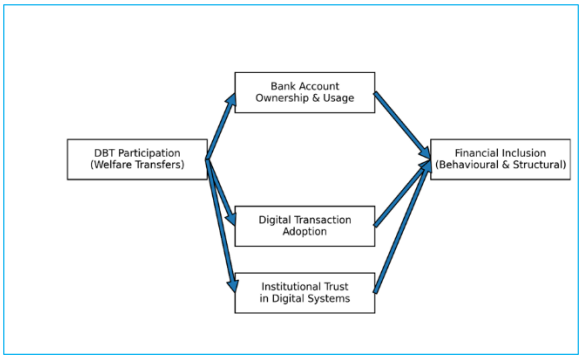

Figure 1. Conceptual Framework: Direct Benefit Transfer and Financial Inclusion

Methods And Materials:

This paper examines how the Direct Benefit Transfer (DBT) programs have contributed to the financial inclusion of beneficiary households in Himachal Pradesh. The report takes into account both behavioural and structural factors of financial inclusion, including access to bank accounts, the frequency of account use, the uptake of digital payment solutions, and beneficiaries' trust in digital welfare delivery systems in 2023-24. The empirical study relies on the household level survey data and is informed by other secondary sources on the subject, including the Global Findex

Database (Demirguc-Kunt et al., 2022), the Report on Trend and Progress of Banking in India (RBI, 2023), and official reports on the Direct Benefit Transfer that the Government of India provides (Government of India, 2024).

The study uses a quantitative explanatory research design in order to test the relationship between DBT participation and financial inclusion outcomes. The empirical model combines descriptive statistics, association analysis, binary logistic regression, and district-level comparison methods to identify patterns, associations, and geographic differences in financial inclusion. It is a strength of the study because various methodological tools are used to enhance the validity of the results and provide a holistic evaluation of how DBT schemes affect financial participation.

Data Preparation and Data Collection:

The study used primary data collected through a structured household survey conducted in the selected districts of Himachal Pradesh. Balanced representation was achieved through a multistage stratified random sampling method to ensure equal representation of rural and semi-urban households. The sample was based on households that receive benefits under the Direct Benefit Transfer (DBT) program, such as LPG subsidies under the PAHAL scheme, as well as other government welfare transfers. The final dataset, after screening and validation, consisted of 600 usable observations. The survey questionnaire collected specific data on respondents' demographic and socioeconomic backgrounds, including age, gender, educational attainment, income level, and location. It also collected information on banking behaviour, including bank account ownership and account usage frequency, and on digital financial behaviour, including the use of the Unified Payments Interface (UPI) and mobile-based payment systems. Moreover, data on DBT participation were also collected, including whether they received a transfer, how often they received a benefit, how satisfied they were with the scheme, and how much they trusted the digital welfare delivery mechanisms. Information regarding access to formal financial services, ranging from savings instruments to credit facilities, was also recorded.

Prior to the empirical analysis, several steps of data processing were followed to ensure the data were accurate and reliable. Validation and consistency checks were conducted, and in cases of incomplete responses, listwise deletion was applied. Categorical variables were recoded as binary or ordinal variables for regression analysis. Standardized residuals were used to identify possible outliers and assess their consistency. Moreover, the composite indicators were normalized to be comparable across districts and to reduce scale effects.

Construction of the Financial Inclusion Index (FII):

To measure financial inclusion at the household level, a composite Financial Inclusion Index (FII) was constructed by combining access-related and behavioural indicators. The index captures four key dimensions of financial participation: (i) ownership of a bank account, (ii) frequency of account usage on a monthly basis, (iii) use of digital payment or transaction

facilities, and (iv) receipt of Direct Benefit Transfer (DBT) payments through a formal banking channel. These indicators jointly reflect the extent to which households have access to and actively engage with formal financial services.

The Financial Inclusion Index is computed as follows:

$$FII_i = \frac{1}{k} \sum_{j=1}^{k} X_{ij} \quad \text{(i)}$$

where FII_i represents the financial inclusion score for the household i, X_{ij} denotes the standardized value of the jth indicator for household i, and k indicates the total number of indicators included in the index. The index values range from 0 to 1, with higher values indicating greater financial inclusion and stronger engagement with formal financial systems.

Descriptive Analysis:

Descriptive statistical techniques were employed to provide an overview of financial inclusion behaviour among the surveyed households. Measures such as frequency distributions, percentages, means, and standard deviations were calculated to summarize key indicators of access to financial services and patterns of financial use. These statistics offer preliminary insights into the extent of Direct Benefit Transfer (DBT) coverage and the level of financial participation across the study area.

The percentage distribution of responses was computed using the following expression:

$$P = \frac{f}{N} \times 100 \quad \text{(ii)}$$

where P denotes the percentage of observations, f represents the number of responses within a particular category, and N indicates the total sample size. The descriptive measures provide a foundational understanding of DBT penetration and help identify variations in financial inclusion outcomes across districts.

Association Analysis (Chi-Square Test):

To assess the relationship between participation in Direct Benefit Transfer (DBT) schemes and behavioural indicators of financial inclusion, Pearson's Chi-square (χ^2) test was employed. This statistical technique was used to determine whether a significant association exists between DBT receipt and key behavioural outcomes, specifically monthly bank account usage, and adoption of digital payment methods.

The Chi-square statistic is calculated as:

$$\chi^2 = \sum \frac{(O-E)^2}{E} \quad \text{(iii)}$$

where O represents the observed frequency in each category, and E denotes the corresponding expected frequency under the assumption of independence between variables. The test assesses whether the observed distribution differs significantly from the expected distribution, thereby indicating an association between DBT participation and financial behaviour.

The statistical significance of the test results was evaluated at the 1% and 5% significance levels. This approach provides empirical evidence on whether receipt of DBT transfers influences patterns of account usage and digital financial engagement among beneficiaries.

Logistic Regression Model:

To examine the key factors influencing financial inclusion among households, a binary logistic regression model was estimated. This approach is

appropriate when the dependent variable is dichotomous and allows estimation of the probability that a household is financially included, based on selected explanatory variables.

The logistic regression model is specified as follows:

$$log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 DBT + \beta_2 \beta Edu + \beta_3 Income + \beta_4 Rural + \beta_5 Age + \varepsilon \quad \text{(iv)}$$

where p represents the probability that a household is financially included. The variable ***DBT*** denotes participation in Direct Benefit Transfer schemes, ***Edu*** represents the respondent's level of education, ***Income*** indicates household income, ***Rural*** is a binary variable capturing place of residence (1 = rural, 0 = otherwise), and ***Age*** refers to the respondent's age. The term ε denotes the random error component.

This model estimates the direction and magnitude of the relationship between DBT participation and financial inclusion while controlling for demographic and socioeconomic characteristics.

Model Estimation and Evaluation:

The estimated regression coefficients were transformed into odds ratios to facilitate the interpretation of the results. The odds ratio for each explanatory variable was computed as:

$$OR = e^{\beta} \quad \textbf{(v)}$$

where $\boldsymbol{\beta}$ represents the estimated coefficient of the corresponding independent variable. The odds ratio indicates the change in the likelihood of financial inclusion associated with a one-unit change in the predictor variable.

The overall performance and adequacy of the model were assessed using standard goodness-of-fit measures, including the Model ***Chi-square statistic***, ***Log-Likelihood values, and Nagelkerke R².*** These indicators provide information on the model's explanatory power and its predictive effectiveness for financial inclusion outcomes.

District-Level Analysis (ANOVA):

To examine variations in financial inclusion across districts, a one-way Analysis of Variance ***(ANOVA)*** was performed. This method allows comparison of mean financial inclusion levels across districts and helps determine whether observed differences are statistically significant.

The ***ANOVA*** test statistic is expressed as:

$$F = \frac{MS_{between}}{MS_{within}} \quad \text{(vi)}$$

where $MS_{between}$ represents the mean square between groups and MS_{within} denotes the mean square within groups. A statistically significant F-value indicates that financial inclusion levels differ across districts, suggesting spatial variation in financial participation outcomes.

All statistical analyses were conducted using SPSS (Version 27).

Results And Discussion:

This section presents empirical evidence from the study on the importance of Direct Benefit Transfer (DBT) schemes for enhancing the financial inclusion of beneficiary households in Himachal Pradesh. The descriptive statistics outline important financial inclusion indicators and the levels of DBT participation. They are

then conducted with inferential analyses of the test of association between variables, multivariate regression analyses to identify key determinants of financial inclusion, and a district analysis of spatial variations. Combined, these findings provide behavioural and structural clues about how participation in DBT affects financial inclusion outcomes. The results are also drawn against national and international standards to add depth to the interpretation process, allowing for the determination of the study area's performance relative to broader trends. The analysis of Tables 1-4 moves from descriptive tendencies towards statistical relationships and comparisons across districts, thus providing a full assessment of the main hypothesis that DBT involvement has a positive impact on financial inclusion.

Table 1. Household-Level Financial Inclusion Outcomes and Direct Benefit Transfer Participation

Indicator	Frequency	Percent (%)
Bank account ownership	547	91.2
Monthly account use	498	83.0
DBT receipt	521	86.8
Digital payments	412	68.7
Trust in DBT	456	76.0

Source: Primary Field Survey, Himachal Pradesh (2023–24).

Note: Percentages are calculated based on valid responses (N = 600).

Table 1 presents the distribution of key financial inclusion indicators for the surveyed households in Himachal Pradesh and provides the first evidence on the level of financial involvement of Direct Benefit Transfer (DBT) beneficiaries. The findings show that formal financial access is high, with 91.2 percent of respondents reporting ownership of a bank account. This is higher than the national averages reported in the Global Findex Database, where account ownership amongst Indian adults was found to be 78 percent (Demirguc-Kunt et al., 2022). Greater account penetration in the current study implies that the mechanisms of DBT related to welfare can have hastened access to finances among target groups by stimulating households to open bank accounts and maintain them. More to the point, financial inclusion in the study area is not restricted to account ownership only. A significant proportion of respondents (83.0 percent) said they regularly used their accounts monthly. The fact that people are actively using formal financial institutions suggests that DBT transfers can help alleviate account dormancy by fostering habitual financial behaviour. The existing research has also indicated that government-to-person transfer programmes could facilitate long-term account utilisation by enabling regular financial flows into beneficiaries' accounts (Banerjee et al., 2017; Muralidharan et al., 2016). The evidence thus confirms that welfare-based financial inclusion programmes can enhance behavioural engagement with formal banking systems.

The data also show that 86.8 percent of respondents receive DBT payments directly into their bank accounts, indicating that the programme is well covered and that digital welfare delivery systems are implemented successfully within the study area. The penetration of DBT is high because it demonstrates the growing role of digital public infrastructure in direct financial transfers and in enhancing the efficiency of public fund use (Gelb and Mukherjee, 2020). DBT programmes seem to be institutional mechanisms that can link welfare delivery to the formal banking system and persuade welfare beneficiaries to use regulated financial procedures. Digital financial behaviour is also evident among beneficiaries. About 68.7 percent of respondents reported using digital payment tools, indicating that more people are accepting technology-enabled financial services. This level of digital adoption is quite high compared to projected rates of digital payments use in most developing economies, where structural factors such as connectivity and financial literacy tend to limit adoption (Sahay et al., 2020). The results suggest that exposure to DBT transfers can foster familiarity with digital platforms, thereby promoting greater use of electronic payment systems. Besides behavioural indicators, the survey also shows relatively high institutional confidence, with 76.0 percent of respondents expressing trust in the DBT mechanism. Trust in the institution is a notable factor in financial involvement, as trust in payment reliability and the system's transparency promotes greater involvement in formal financial services (Khera et al., 2022). The research indicates that implementing DBT has enabled beneficiaries to trust digital welfare systems and government-provided services more.

Combined, the findings suggest that DBT schemes help increase access to banking services and ensure the active, long-term use of financial and digital payment systems. High account ownership, frequent account use, engagement with digital transactions, and institutional trust imply that DBT is a structural driver of behavioural financial inclusion. These results are consistent with the broader thesis that digital welfare transfers can enhance financial engagement by aligning social protection schemes with formal financial infrastructure (Ozili, 2021; World Bank, 2022).

Table 2: Association Between DBT Participation and Behavioural Financial Inclusion Indicators

Variable	χ^2	p-value
DBT Receipt vs. Account Use	25.419	<0.001
DBT Receipt vs. Digital Transaction Usage	18.732	<0.005

Source: *Computed from Primary Field Survey Data (2023–24), Himachal Pradesh.*

The findings of the Pearson Chi-square test that analyses the correlation between Direct Benefit Transfer (DBT) participation and the behavioural measures of financial inclusion, i.e., regular account usage, and adoption of digital transactions, are reported in Table 2. The findings indicate statistically significant correlations with both indicators, suggesting that DBT participation is strongly associated with better financial behaviour among beneficiaries.

The association between DBT receipt and monthly account utilization is statistically significant ($\chi^2 = 25.419$, $p < 0.001$), indicating that households that have purchased DBT are more likely to use their bank accounts. This observation suggests that DBT payments facilitate regular financial transactions, motivating beneficiaries to continue using formal banking services. The outcome favours the behavioural financial inclusion approach, which asserts that policy interventions can trigger financial participation by establishing regular financial contact with formal institutions. These and other studies on digital welfare transfers have found similar effects: increased account activity and decreased account dormancy through government-to-person payment systems (Banerjee et al., 2017; Muralidharan et al., 2016).

There is also a substantial relationship between receiving DBT and using digital transactions ($\chi^2 = 18.732$, $p < 0.005$). Such an outcome means that the beneficiaries of the DBT are more likely to switch to digital payment options. Exposure to digital welfare transfers can make people more familiar with electronic payment systems and less hesitant to adopt technological changes. Past studies indicate that digital transfer programmes enhance user confidence in digital financial services and increase the uptake of financial technology (Sahay et al., 2020; Khera et al., 2022). The results support the hypothesis that participation in DBT enhances behavioural financial inclusion through stimulating regular banking and digital financial involvement, with strong empirical evidence. These findings support the idea that digital welfare policies are used not only for income transfer but also to enhance financial participation.

Table 3. Logistic Regression Estimates of Factors Influencing Financial Inclusion

Variables	Coefficient (β)	Std. Error	Odds Ratio	p-value
DBT Participation	0.842	0.215	2.32	<0.001
Education Level	0.391	0.148	1.48	0.009
Household Income	0.276	0.112	1.32	0.015
Rural Residence (1=Rural)	-0.314	0.169	0.73	0.063
Age	0.018	0.007	1.02	0.021
Constant	-1.476	0.412	—	<0.001

Note: *Model Statistics: N = 600, Log Likelihood = -324.18, Pseudo R^2 (Nagelkerke) = 0.27 and Model $\chi^2 = 58.42$ ($p < 0.001$)*

Source: *Estimated from Primary Field Survey Data (2023–24), Himachal Pradesh.*

The outcomes of the binary logistic regression analysis to determine the determinants of financial inclusion among the surveyed households are shown in Table 3. The general model is statistically significant (Model $\chi^2 = 58.42$, $p < 0.001$), indicating that the explanatory variables jointly predict financial inclusion outcomes. The model accounts for a moderate amount of the variation in financial inclusion (Nagelkerke $R^2 = 0.27$), compared with cross-sectional household-based research.

The most significant factor influencing financial inclusion is the DBT participation ($\beta = 0.842$, $p < 0.001$). The odds ratio of 2.32 indicates that households that receive DBT transfers are more likely to be financially included than households that do not. This observation shows the radical nature of DBT as a policy tool that connects welfare provision to inclusion in formal financial institutions. The finding aligns with previous findings indicating that digital transfer programmes enhance financial engagement by increasing transaction frequency and trust in institutions (Gelb and Mukherjee, 2020; Khera et al., 2022). There are also positive, statistically significant effects of education level and household income on financial inclusion. Higher levels of education could make them more financially literate and aware of formal financial services, and higher income levels will increase their ability to conduct financial transactions. These results are consistent with the financial capability framework that highlights the importance of socioeconomic factors in determining financial behaviour (Ozili, 2021). Financial inclusion is negatively associated with rural residence, but the effect is not very significant. This implies that rural households might face structural limitations, including limited banking infrastructure and digital access. Age is a small yet important positive factor, suggesting that older people may be more interested in formal financial services because they have experience with financial matters. The regression analysis supports the study's main hypothesis: participation in DBT significantly increases financial inclusion, even after controlling for demographic and socioeconomic factors.

Table 4. Regional Differences in Financial Inclusion Outcomes Across Selected Districts

District	Bank Account Ownership (%)	Monthly Account Usage (%)	DBT Receipt (%)	Digital Payment Usage (%)	Financial Inclusion Index (Mean ± SD)
Chamba	88.5	79.2	84.0	63.5	0.78 ± 0.21
Kullu	93.7	87.6	90.5	72.8	0.85 ± 0.18
Solan	91.3	82.1	86.2	69.4	0.82 ± 0.19
Overall	91.2	83.0	86.8	68.7	0.82 ± 0.20

Note: *ANOVA Test: F = 6.84, p = 0.001*

Source: *Primary Field Survey Data (2023–24), Himachal Pradesh.*

Table 4 presents differences in financial inclusion outcomes and participation in DBT across selected districts of Himachal Pradesh. Though the general level of financial inclusion in the study region is high, significant differences in financial participation across districts indicate that the outcomes of financial inclusion are not evenly distributed. Kullu performs best across most indicators. It records a high rate of bank account ownership (93.7%), DBT receipt (90.5%), and digital payment usage (72.8%), which is reflected in its highest Financial Inclusion Index value (0.85 ± 0.18). On the contrary, Chamba shows lower monthly account usage (79.2%) and digital payment adoption (63.5%), resulting in a lower Financial Inclusion Index (0.78 ± 0.21). Solan is a middle-range, as the indicators show moderate performance, with a Financial Inclusion Index value of 0.82 ± 0.19. These differences across the districts are statistically significant, as evidenced by the ANOVA ($F = 6.84$, $p = 0.001$). This can be taken to mean that, though DBT schemes receive significant coverage, consumption of financial services differs across regions. That is, the availability of DBT does not guarantee similar results of financial inclusiveness. These differences can mostly be attributed to existing differences in banking systems and access to digital technologies. According to reports prepared by the Reserve Bank of India (RBI, 2023), branch density, the number of Business Correspondents, and digital connectivity differ significantly across districts, especially in geographically remote locations such as hill states. Areas with enhanced banking coverage and digital networks tend to have greater financial activity and digital transaction use. The comparatively good performance of Kullu can thus be linked to easier access to banking services and a more developed financial infrastructure that facilitates easier transactions and promotes the increased use of formal financial systems. Solan's moderate performance seems to align with its semi-urban nature and the availability of stable financial services. Conversely, Chamba's reduced digital financial capacity can be attributed to geographical factors, limited in-person access to banking services, insufficient physical access, or inadequate internet connectivity. The results imply that, though DBT programmes have increased the financial accessibility within the districts, the financial inclusiveness of various districts relies on facilitating supply-side factors, including banking access and digital preparedness. DBT schemes may trigger demand for financial services, but to achieve long-term, balanced financial inclusion, additional institutional capacity and technological infrastructure are needed, especially in geographically remote areas. The theoretical postulate that policy-sustained financial interventions are supported by empirical findings from this research, which indicate that behavioural financial inclusion can be boosted by repeated exposure to formal financial systems. In line with the financial intermediation theory, access to institutional financial channels and sustained engagement are promoted through DBT transfers. The

findings also align with the digital public infrastructure framework, which states that integrated digital systems will lower transaction costs and improve the efficiency of service delivery. Moreover, the behavioural financial inclusion perspective is justified by the observed relationship between DBT participation and account usage, indicating that financial inclusion is not limited to access to maintained financial interaction.

Comparison With Existing Literature:

The empirical findings of the current research are largely consistent with previous studies on digital welfare transfers and financial inclusion. In line with the above results reported by Banerjee et al. (2017) and Muralidharan et al. (2016), the data indicate that government transfers sent digitally motivate recipients to use their bank accounts more frequently and enhance their interaction with formal financial systems. The positive impact of DBT participation on financial inclusion also supports the perception that digital public infrastructure could enhance the financial participation process by maximizing payment efficiency and strengthening trust in institutional mechanisms (Gelb and Mukherjee, 2020; Khera et al., 2022). Simultaneously, the analysis shows significant disparities in financial inclusion outcomes across districts, which is significant given local infrastructure conditions. This finding aligns with previous studies that argue that institutional reach, technological capabilities, and regional differences in development predominantly determine the availability of financial services in emerging economies (International Monetary Fund, 2021; Ozili, 2021). The study would broaden the existing literature by offering household-level evidence from a geographically distinct region to examine the behavioural effects of digital welfare programmes across different regional environments.

Findings:

Empirical research indicates a high level of formality in financial inclusion among households receiving direct benefit transfer (DBT) benefits in Himachal Pradesh. A high percentage of respondents (91.2 percent) indicated they have a bank account, though 83 percent reported using it regularly. These findings indicate that DBT schemes have not only widened access to banking services but also promoted sustained use of formal financial sources. The data shows that financial inclusion in the establishment extends beyond account ownership to active participation in financial institutions. The paper also establishes a strong correlation between participation in DBT and behavioural aspects of financial inclusion. The Chi-square test indicates statistically significant correlations between receiving DBT and the frequent use of an account, and between participating in DBT and adopting digital payment methods. This indicates that the idea behind DBT transfers is to motivate beneficiaries to communicate more with banking systems and online financial platforms, thereby reducing the risk of inactive accounts and ensuring financial activity. The regression analysis further supports these results. Even after adjusting for demographic and socioeconomic factors, households that receive benefits in the DBT

are found to be over twice as likely to be financially incorporated as compared to non-beneficiaries. Financial inclusion is positively associated with education and household income, suggesting that higher socioeconomic status leads individuals to use formal financial services. Rural residence, in turn, is negatively correlated with financial inclusion, underscoring potential infrastructure and digital access issues.

The district-level spatial analysis shows significant variation in financial inclusion. The districts exhibit better banking infrastructure and greater digital connectivity, and the geographically distant ones demonstrate relatively low rates of digital financial participation. These results suggest that, despite widespread coverage of DBT schemes, the effectiveness of this strategy in promoting financial inclusion is conditioned by local institutional and technological factors. In general, the findings indicate that DBT schemes are significant in enhancing financial inclusion through access to and utilization of financial services. Nevertheless, socioeconomic traits, the presence or absence of infrastructures, and geographical differentiation determine the depth and sustainability of financial inclusion.

Policy implications and conclusion:

This paper presents an empirical study of the importance of Direct Benefit Transfer (DBT) programs in enhancing financial inclusion for households in Himachal Pradesh. The results indicate that DBT membership is significantly associated with increased access to formal financial services, increased account use, and the use of digital payment options. The findings underline that DBT schemes not only increase financial access but also foster greater involvement of behaviour in banking and digital financial systems. The analysis also shows that the probability of financial inclusion is very high among participants in DBT, even after controlling for demographic and socioeconomic factors. This substantiates the significance of the digital welfare transfers as a political tool that connects social protection systems and formal financial inclusion. Meanwhile, the research finds significant spatial divergence in the outcomes of financial inclusion, indicating that infrastructure provision, digital access, and physical location affect the success of DBT-based inclusion.

Policy-wise, the results show that an increase in welfare transfers alone is insufficient for sustainable financial inclusion. First, it is necessary to strengthen the last-mile banking infrastructure, especially in geographically isolated areas. Growing the network of branches, expanding Business Correspondent coverage, and increasing ATM availability can help people access financial services and reduce disparities across regions. Second, digital financial literacy programs must be targeted to raise awareness, instill user confidence, and promote the effective use of digital financial channels, particularly among the rural population.

Third, policymakers must promote diversified financial participation among DBT beneficiaries by adopting savings accounts, insurance services, and other formal credit services beyond welfare transactions. This can be achieved through

measures that turn welfare-related financial access into permanent financial empowerment. Fourth, there should be a greater focus on financial inclusion policies through usage-based indicators rather than solely on account ownership, as ongoing usage is a more indicative measure of financial inclusion. DBT schemes are a significant element of India's digital public infrastructure, contributing to increased financial participation. Nevertheless, the long-term success of financial inclusion programs is conditional upon parallel investments in infrastructure development, the enhancement of digital capabilities, and policy-specific interventions in a region. This is because these structural challenges must be addressed to achieve equitable and sustainable financial inclusion across regions.

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