



Structural safeguards and early educational sorting: Evaluating the efficacy of academic and economic baselines in the Medha Protsahan Yojana

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Abstract

Marginalized groups in India are systematically excluded from the elite higher education and state administration through the increasingly mediated “shadow education” system, as economic hardship and geographic isolation make access impossible. Modern state governments have responded with a “Contract State” model, in which targeted welfare funds state-sponsored access to private coaching markets. The Direct Benefit Transfer (DBT) mechanism in Himachal Pradesh's Medha Protsahan Yojana, which employs a dual-safeguard architecture with a ₹2.50 lakh family income ceiling and a relaxed 65% academic baseline for Scheduled Caste (SC) and Scheduled Tribe (ST) candidates, is evaluated structurally in this paper. The study uses descriptive and inferential statistics, such as Independent Samples T-Tests, Kruskal-Wallis H Tests, and Chi-Square Tests of Independence, to evaluate these thresholds using primary administrative data from the 2020–21 beneficiary cohort (N = 500). Empirical evidence indicates that a flat academic baseline would virtually exclude tribal beneficiaries due to spatial disadvantage and thus mathematically validate the state's structural protections. Additionally, the data shows that the SC cohort is extremely economically vulnerable (median annual income of ₹40,000), which is strongly correlated with early non-STEM educational sorting. Results suggest that targeted post-secondary DBTs are effective at preventing elite capture but concurrent early-stage secondary interventions are needed to prevent marginalized students from exiting technical pathways before coaching subsidies are available.

Keywords: Himachal Pradesh, state government, positive discrimination, Medha Protsahan Yojana, direct benefit transfer (dbt), shadow education, and educational sorting

Introduction

Coaching businesses in India are becoming increasingly commercialised and competitive as they mediate the transition from secondary school to elite higher education and state administration. Access to education has become increasingly stratified. Entry into elite technical institutions such as the Indian Institutes of Technology (IITs) and All India Institutes of Medical Sciences (AIIMS), and central and state civil services, is structurally dependent on specialised preparatory coaching. This phenomenon, often called the ‘shadow education system’, effectively privatises the competitive advantage. This leads to the structural exclusion of persons belonging to disadvantaged social groups from these high prestige academic and professional trajectories, more especially those who have to face the compounded vulnerability of poverty and geographic isolation in hill states like Himachal Pradesh.

This imbalance in structure has led state governments to shift their administrative strategy more and more away from direct suppliers of adjunct education and toward a ‘contract state’. In this model, the state intervenes to develop human capital by subsidising access to the private coaching market for vulnerable populations. This intervention is operationalised in Himachal Pradesh through Medha Protsahan Yojana. The programme was launched as a specific public policy tool that provided a ₹1,00,000 Direct Benefit Transfer (DBT) to meritorious students thus outsourcing the delivery of world-class competitive coaching at the cost of the intended beneficiaries.

The financial architecture of the scheme is simple but the DBT's eligibility criteria are structurally devised in such a

manner as to suggest an administrative sophistication to balance localised socio-economic equality with standardised academic merit. The policy maintains a strict annual family income ceiling of ₹2.50 lakhs to prevent very rich demographics from monopolising public resources, a vulnerability prevalent in state-sponsored welfare. Additionally, the program requires a varied academic entry bar in recognition of historical, geographical, and systemic educational gaps. Candidates from the General category must score at least 75% on their qualifying exams, however candidates from the Scheduled Caste (SC) and Scheduled Tribe (ST) have this requirement drastically relaxed to 65%. In order to assess the effectiveness of such a decentralised welfare program, it is necessary to look beyond enrolment statistics at the macro level and examine the beneficiaries' underlying economic and academic backgrounds. There is still a significant lack of empirical, micro-level administrative assessments of whether these particular policy thresholds are useful in real-world situations or are just arbitrary bureaucratic markers.

The central question in this paper is whether the structural protections of the state, namely the income cap of ₹2.50 lakh and the differentiated 65% academic level, are administratively and empirically necessary to prevent the systematic exclusion of vulnerable groups. Using primary administrative data of the 2020-21 cohort of Medha Protsahan Yojana grantees (N = 500), this study assesses the association between caste stratification and economic baselines and early academic stream selection. In this paper, we explore the structural realities of the SC and ST cohorts

to understand how stark economic vulnerability and early non-STEM educational sorting necessitate stringent policy concessions. The ultimate goal of this study is not merely to concede merit, but to prove that the dual-safeguard architecture of the state is a mathematically required intervention to stop the systematic exclusion of the tribal and marginalised communities from the state-sponsored competitive mobility.

Literature Review

The political economy of the private coaching market or “shadow education”, the socio-legal mechanisms of caste-based affirmative action and the administrative development of Direct Benefit Transfers (DBT) as a tool for public service delivery are three distinct academic discourses that converge in the literature on state-subsidised human capital development.

1. Political Economy of the Shadow Education and Coaching Industry

The world-wide explosion in private supplementary education, or “shadow education” as it is called in academic circles, has altered the route to the most desirable jobs and to higher education.

The Foundational Construct: Bray (1999) ^[2] provided the theoretical framework for shadow schooling, demonstrating how private tutoring functions within the logic of the market, but at the same time replicates the content and scale of the formal education system. Building on this global body of research, Bray (2021) ^[3] demonstrates how unmonitored shadow education worsens economic inequality, with the rich able to pay for high-quality tutoring and the lower classes routinely denied access.

Neoliberal Class Dynamics: Holloway and Kirby (2020) ^[6] locate private tuition within the broader neoliberalization of education. They contend that middle and upper class families use private tutoring as a geographic and socioeconomic strategy to entrench class privilege and convert private financial resources into a competitive scholastic advantage.

Indian Entrance Exam Market: George (2023) ^[5] states that the national entrance exams in India like NEET, JEE and UPSC are highly competitive. George demonstrates how access to elite technical and administrative jobs has become structurally dependent on preparation for specialised admission exams, effectively decoupling it from secondary school achievement.

From “Shadow” to “Parasite”: The tutoring industry in India has been commercialized very rapidly (Kumar *et al.*, 2024) ^[8]. Coaching centres are said to weaken faith in traditional education and become inevitable for survival. Families, hence, spend a lot of money on coaching centres, widening the gap between the rich and the poor.

2. Educational Transitions, Caste Stratification and Affirmative Action

Affirmative action seeks to address the historical and systemic exclusion of marginalised castes in India, while shadow education commodifies academic advantage.

Macro-Assessments of Affirmative Action: Deshpande (2013) ^[4] critiques affirmative action in India. She argues that although caste-based quotas have enabled people to be represented in public institutions, market-driven economic expansion and privatised education have created new axes of inequality that are hard for traditional reservation policies to address.

Empirical Redistribution & Target Accuracy: Bertrand *et al.* (2010) ^[1] study engineering college admissions in India to test the empirical effectiveness of affirmative action. Their findings show that caste-based targeting is a successful means of redistributing access to higher education in favour of applicants from economically disadvantaged backgrounds, and provide evidence that affirmative action reduces large baseline gaps without compromising labour market gains after admission.

Institutional Discrimination and Lived Realities: Sukumar (2022) ^[11] explores the functioning of Indian universities. It moves beyond the usual admissions metrics to reveal how institutional hostility, lack of social capital, and structural caste discrimination continue to shape the landscape of higher education, frequently marginalising Scheduled Caste (SC) and Scheduled Tribe (ST) students.

Micro-Level Peer Disparities: At the micro-level, Rampal and Khan (2022) ^[9] complement the work of Sukumar by providing experimental evidence from higher education institutions to show how attitudes to reservation policies are reflected in social sorting, peer interaction and study group formation. This suggests that social stratification may not end with formal access.

3. Delivery of Welfare State and Direct Benefit Transfer (DBT)

The Indian government has increasingly resorted to technology-enabled financial interventions to bridge the gap between the goals of affirmative action and the constraints of the private market.

Grassroots Awareness and Administrative Reach: An empirical study by Selvam and Velmurugan (2015) ^[10] on awareness of Direct Benefit Transfer (DBT) underscores the significance of financial literacy, banking infrastructure and administrative transparency at the grassroots level for the successful implementation of direct cash transfers.

Fiscal Efficiency vs. Structural Bottlenecks: The macro-economic and administrative aspects of the DBT processes in India have been critically examined in Joy (2018) ^[7] and structural bottlenecks compared with fiscal efficiency. DBTs can cut transaction costs, middleman exploitation and administrative leakage, but Joy notes the structural impact is often limited by procedural delays, documentation requirements and uneven digital infrastructure.

4. The Research Gap: There is a considerable body of research on the commercialisation of shadow education (Bray, 1999; Kumar *et al.*, 2024) ^[2, 8], the administrative mechanics of DBTs (Joy, 2018) ^[7] and the structural requirement of caste-based affirmative

action (Deshpande, 2013; Bertrand *et al.*, 2010) ^[1, 4]. However, there are few empirical studies that examine how the “Contract State” buys entry into the private coaching market for marginalised children through targeted DBTs.

Data and Methodology

This study is built on the theoretical critique of policy and uses primary administrative data to fill the empirical knowledge gap regarding the effectiveness of structural safeguards in state-sponsored competitive mobility.

1. Data Source and Cohort Profile

The main data set of the study was provided by the Directorate of Higher Education, Government of Himachal Pradesh. It has all the administrative documents of Medha Protsahan Yojana for academic year 2020-2021^[3]. The final sample consists of 500 validated beneficiaries (N=500) who had availed ₹1,00,000 Direct Benefit Transfer for competitive test coaching and were eligible for the same. We do not use self-reported survey samples but primary administrative data. This implies that there is no self-selection bias and that we get an unbiased picture of the parameters of the policy implementation.

2. Operational Variables

To analyze the impact of the program's dual safeguard design on marginalized populations, the data was divided into three major operational variables:

Social Stratification (Categorical): The beneficiaries are categorized on the basis of the three constitutional social categories i.e. General, Scheduled Caste (SC) and Scheduled Tribe (ST). Note: In this analysis, the General, SC and ST cohorts have been bifurcated only to assess extreme structural vulnerability.

Academic Baseline (Continuous): Overall percentage scored by the candidate in his 10+2 board exams. The main indicator of proximity to the state's differential admission thresholds—75% for General and 65% for SC/ST—is this variable.

Economic Baseline (Continuous): The annual household income (in Indian rupees) that is statutorily validated and provided during the application procedure, with a universal ceiling of ₹2.50 lakhs.

Early Educational Sorting (Categorical): The academic path chosen by the applicant at the 10+2 level, generally divided into STEM (science) and non-STEM (arts and commerce) tracks.

3. Analytical and Statistical Strategy

The methodological approach confirms the administrative need of the state's policy thresholds by means of a combination of descriptive and inferential statistics. First, descriptive statistics including means, medians, and percentile distributions are employed to establish the baseline realities of the cohort. Second, as a check of the statistical significance of the observed differences and for the fact that they are not specific to the 2020-21 cycle, three particular tests of inference are used:

The Independent Sample T-Test: is used for comparison of mean 10+2 academic scores of General and ST cohorts to assess the statistical need of 65% relaxed criterion.

Kruskal Wallis H Test (Non-Parametric ANOVA): Since income data are generally right-skewed and non-normal, this non-parametric test is used to determine a significant difference in the median household incomes across the social categories below the ₹2.50 lakh ceiling.

Chi-Square Test of Independence: This approach quantifies pre-coaching structural divergence with cross-tabulation data of stream distribution to test mathematically whether a candidate's early educational sorting (STEM vs. Non-STEM) is statistically dependent on his/her social category.

Empirical Results

An empirical investigation of the 2020-21 Medha Protsahan Yojana cohort (N = 500) confirms the administrative rationale of the scheme's differentiated eligibility criteria. The study highlights structural vulnerabilities of Scheduled Tribe (ST) and Scheduled Caste (SC) populations and also shows extreme inequality among beneficiaries by examining the confluence of academic achievement, household income and stream selection.

1. Validating the ST Baseline, or the Differentiated Academic Threshold

The regulatory framework of the plan has a lower entry requirement of 65% for the reserved categories and 75% academic minimum for the applicants belonging to the general category. An Independent Samples T-Test was performed to compare the 10+2 scores of the General and ST cohorts to determine if this relaxation is a structural requirement or an arbitrary concession.

Table 1: Academic baseline distribution and t-test results.

Social Category	Mean 10+2 Score (%)	Median 10+2 Score (%)	Minimum Score (%)	T-Test Significance
General	75.73	76.10	75.00	—
Scheduled Tribe (ST)	66.33	65.20	65.00	p < 0.001

However the data strongly support the particular 65% structural relaxation for tribal demography. Average academic achievement of ST recipients at 10+2 level is 66.33% and median score is 65.20%. Those figures are a little above the state's lenient cutoff. The T-Test indicates that the academic difference between the General and ST cohorts is highly statistically significant (p<0.001). The mathematical observation also has a significant implication. Had the Himachal Pradesh government applied the 75% universal yardstick for all categories in the name of uniform merit, the entire tribal group would have been regularly denied. Thus, the 65% policy concession functions as both a hard and fast administrative requirement and an affirmative action device to prevent the complete exclusion of tribal populations from state-sponsored competitive mobility.

2. Household Economic Vulnerability Measures (The SC Baseline)

The economic baselines analysis shows that there is quite a bit of financial stratification in the qualifying pool although all beneficiaries have to be below the overall annual income ceiling of ₹2.50 lakh. Reported family incomes were tested with a Kruskal-Wallis H Test, a non-parametric alternative to ANOVA, to determine the distribution of household wealth among categories.

Table 2: Economic Vulnerability Index (Household Income in INR)

Social Category	Mean Annual Income (₹)	Median Annual Income (₹)	Minimum Income (₹)	Kruskal-Wallis Test
General	1,42,500	1,35,000	45,000	—
Scheduled Caste (SC)	53,877	40,000	18,000	$p < 0.001$

A Kruskal-Wallis test shows a very significant difference in median wages between categories ($p < 0.001$). The SC cohort is the most economically deprived segment of the program's users. SC category claimants reported a median family income of just under ₹40,000 per annum or a household income of ₹3,300 per month. The General category median income is comfortably in the middle of the income eligibility range. The numbers point to the practical efficacy of the income ceiling of the Medha Protsahan Yojana in that it does not fall in the middle income range, and reaches the very bottom of the economic pyramid among the underprivileged castes. The ₹1,00,000 DBT is not just another subsidy for the SC demographic. It is a financial intervention that is double their total annual household income and the only way they can participate in the shadow education market, with state support.

3. Initial Sorting by Education and Difference Before Coaching

The data also reveal a direct relationship between economic fragility and early educational sorting, which naturally determines the trajectory of a candidate's competitive coaching. To test for dependence of stream selection on social category, a Chi-Square Test of Independence was applied to the 10+2 stream distribution.

Table 3: Educational Sorting Early (Stream Choice Prior to DBT Use)

Social Category	STEM (Science)	Non-STEM (Arts/Commerce)	Total Cohort Share
General	88.2%	11.8%	100%
Scheduled Caste (SC)	74.4%	25.6%	100%

(Chi-Square Test of Independence: = 14.32, $p < 0.001$)

An analysis of the distribution of 10+2 streams indicates that SC students are overrepresented in non-STEM streams, compared to their unreserved peers. Only 11.8% of the General candidates have opted for the Arts and Commerce streams as against about 25.6% of the SC cohort. This difference is statistically significant by Chi-Square test (=14.32, $p < 0.001$).

This gap suggests that marginalized candidates are systematically exiting elite technical pathways well before the coaching subsidy is provided. STEM tracks (Science) are the main entry point for expensive, elite coaching (such as NEET for medicine and JEE for engineering). Hence, the state's DBT intervention is still very important for technical aspirants, and SC students who are willing to take state administrative, clerical and banking exams through non-STEM routes.

Discussion and Policy Implications

The 2020–21 cohort of the Medha Protsahan Yojana offers fresh and important insights into the realities of state-funded human capital development. The data shows that the state's eligibility architecture is not just a set of arbitrary bureaucratic signposts, but a finely tuned response to extreme socioeconomic and geographic stratification.

1. Meritocracy vs. Equity in Hill Regions

The statistical validation of the Scheduled Tribe (ST) academic baseline calls into question the neoliberal argument that standardized testing is an equitable and universally applicable measure of merit. Data shows that the state's lenient 65% elimination line is dangerously close to the median 10+2 score of 65.20% for the ST cohort.

This divide in Himachal Pradesh's administrative setup is not due to lack of individual aptitude but due to spatial disadvantage. The tribal population of the state is mostly concentrated in high altitude districts Lahaul, Spiti, Kinnaur and Bharmour area of Chamba which are difficult to access. Such remote schools usually have poor infrastructure, bad weather that interrupts schooling and difficulty retaining teachers. And so, it successfully conflates accumulated geographic privilege with inherent merit to expect a uniform 75% baseline from a tribal candidate in Lahaul to match a general category candidate in the urban centres of Shimla or Dharamshala. In order to counteract this geographic penalty and prevent the "Contract State" model from unintentionally becoming an exclusionary tool for the urban elite, the state's 65% relaxation is essential.

2. The Relationship Between Early Stream Sorting and Deep Poverty

The data of the Scheduled Caste (SC) cohort points to the disadvantages of interventions only at the post-secondary level. In this policy framework, SCs are located at the bottom of the economic pyramid with a median annual household income of a meager ₹40,000. This extreme economic vulnerability is strongly associated (with more than double the percentage) with the early educational divergence of the cohort (25.6% of SC beneficiaries are channelled into non-STEM tracks (Arts and Commerce) as compared to the General category (11.8%)).

This pre-coaching divergence highlights the "anticipatory effect" of the shadow education market. By the time they reach the matriculation (10th) level, families that are deeply impoverished realize that they will never be able to afford to fulfill their aspirations of becoming doctors or engineers because high-stakes STEM coaching (for NEET and JEE) is prohibitively expensive. Hence, students drop out of non-STEM streams even before the state's DBT intervention is offered, giving up on elite technical pathways. The

₹1,00,000 DBT comes too late in the education life cycle to correct the initial sorting by streams, but it does pay for their eventual coaching for state administrative, banking or clerical exams. Therefore, financial intervention at the 10+2 level is important but it cannot take care of the structural divergence taking place at an earlier stage of education.

3. Avoiding Systemic Lockout

The results ultimately justify the theoretical necessity of the Dual-Safeguard Framework. State provision of welfare in private markets is always vulnerable to “elite capture”. If the Medha Protsahan Yojana had no income ceiling of Rs 2.50 lakh. The middle and upper classes, who have the social and academic capital to clear the competitive exams, would avail of the Rs 1,00,000 subsidies.

At the same time the program would cut out the very groups it is constitutionally obligated to protect if it were not for the relaxed 65% academic threshold. Consequently, the policy design of the Medha Protsahan Yojana is successful in that it favors targeted equity over uniform standardized metrics. It understands that in a society marked by great inequality, equal results require unequal administrative thresholds.

Key Takeaways for State Administration

- a. **The 65% Threshold is Non-Negotiable:** Mathematically, the data suggests that increasing the academic cutoff for the reserved categories would virtually exclude the beneficiaries from the tribal category as they are spatially and infrastructurally disadvantaged.
- b. **Deep Targeting Success:** By successfully removing the “creamy layer”, the ₹2.50 lakh income ceiling makes sure that state funds reach ultra-low income households (the median for SCs is ₹40,000), where DBT exceeds total family income annually.
- c. **Timing of Intervention:** As economic vulnerability pushes SC students into non-STEM streams early on, state policymakers should consider parallel interventions at the 9th and 10th grade levels to keep marginalized students on elite technical pathways.

Conclusion

The privatisation of competitive advantage through the shadow education system is one of the biggest obstacles to fair administrative mobility in contemporary governance. Direct Benefit Transfers have changed the way welfare is delivered through State interventions. However, the effectiveness of these transfers in developing human capital is entirely dependent on the accuracy of the targeting strategies. The present study has studied a primary dataset of 500 beneficiaries of academic cycle 2020 – 21 to evaluate the functional efficacy of dual-safeguard architecture in the Medha Protsahan Yojana.

The empirical results provide a clear validation of the administrative thresholds of the state. The relaxed 65 per cent academic baseline for Scheduled Tribes candidates is a structural requirement, not an arbitrary concession, data shows. In this way, the spatial and infrastructural disadvantages of the high altitude districts of Himachal Pradesh will mean that tribal populations will be almost

completely excluded from state-sponsored competitive mobility. Likewise, the introduction of a parental income threshold of ₹ 2.50 lakh effectively bypasses the “creamy layer” to ensure that the benefits reach the most economically backward sections, particularly the Scheduled Caste beneficiaries whose median household incomes are much lower than the state averages.

But the findings also underscore a critical weakness in the state’s timeline of intervention. The fact that SC students branch off early into non-STEM academic streams in a statistically significant manner suggests that marginalized candidates are pushed to leave elite technical fields (such as engineering and medicine) long before the subsidies for post-secondary coaching are introduced, because of severe economic vulnerability.

This research emphasizes the necessity of highly calibrated, unequal administrative baselines for equitable public policy. It is an empirical study at basic level on the implementation of Medha Protsahan Yojana through Direct Benefit Transfer in Himachal Pradesh. In future, Directorate of Higher Education, Shimla policymakers should consider adding early stage interventions in existing programme. At matric level, targeted STEM counselling and initial financial guarantees for vulnerable cohorts would ensure that the DBT actively retains marginalised students on the best academic paths rather than merely sponsoring non-technical coaching. In the end, the Medha Protsahan Yojana serves as an essential administrative model, demonstrating that the only defense against the systemic lockout of the most vulnerable when state welfare is injected into private markets is fiercely defended demographic and economic safeguards.

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