MODELING THE LONG-TERM ECONOMIC RETURNS AND COST-EFFECTIVENESS OF MEDHA

Evidence from a Randomized Controlled Trial
and Lifetime Earnings Projections

Technical Summary of Primary Impact Estimate:

Item	Value
Evaluation design	Randomized Controlled Trial
Baseline sample size	1,409 students
Treatment group	987
Control group	422
Endline respondents	676
Primary outcome	Monthly income (₹), including zeros
Estimation method	Linear regression (Intent-to-Treat)
Treatment effect	₹1,799 per month
Standard error	₹909
p-value	0.048
Specification	$Income_i = \beta 0 + \beta 1\ Treatment_i + \beta 2\ Female_i + \Sigma\ \gamma_b\ Batch_b + \varepsilon_i$
Standard errors	Clustered at batch level

This estimate forms the basis for the cost-effectiveness analysis presented in the accompanying Benefit-Cost Brief.

Technical Appendix
Prepared by Medha
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Approach:

ESTIMATING THE INCOME IMPACT OF MEDHA

To estimate the effect of Medha's program on career earnings, we use data from the randomized controlled trial (RCT) endline survey. The primary outcome is monthly income, with non-earners assigned a value of zero. Income responses reported in categorical survey ranges were converted to approximate monthly values using the midpoint of each income bin.

This specification is estimated on the full sample of observed endline respondents and yields an intent-to-treat (ITT) estimate of average income gains per student assigned to the program. Including non-earners ensures that the estimate captures both extensive-margin effects (whether participants are working) and intensive-margin effects (how much they earn if working), while remaining aligned with program costs, which are incurred for all students served.

INCOME IMPACT REGRESSION

The primary estimate is obtained using the following linear regression specification:

$$Income_i = \beta 0 + \beta 1\ Treatment_i + \beta 2\ Female_i + \varepsilon_i + \Sigma\ \gamma_b\ Batch_b + \varepsilon_i$$

where:

- **Income_i** is monthly income (including zeros for non-earners)
- **Treatment_i** indicates assignment to Medha
- **Female_i** controls for systematic gender differences in early-career earnings
- **Σ γ_b Batch_b** represents batch/cohort fixed effects

Standard errors are clustered at the batch level (30 batches) to account for within-batch correlation in outcomes, consistent with the randomization design. The coefficient on Treatment represents the intent-to-treat effect of Medha assignment on monthly income.

ESTIMATED INCOME EFFECT

The regression estimates that students assigned to Medha earn ₹1,799 ($20) more per month on average than students in the control group ($p = 0.048$).

Because the regression includes individuals who are not currently employed, the estimate reflects both:

- the **extensive margin** (higher employment probability)
- the **intensive margin** (higher earnings among those working)

Table A1. Income Impact Regression

Variable	Coefficient	Std. Error	p-value
Treatment (Medha assignment)	1,799	(909)	0.048
Female	control variable		
Constant	intercept		

Notes

- **Outcome variable:** monthly income including zeros for non-earners.
- **Estimation method:** linear regression (intent-to-treat).
- **Standard errors** clustered at the batch level.
- N = 676 endline respondents.

A robustness check excluding control variables produces a similar estimate (**₹1,522 per month**), indicating that the result is not sensitive to model specification.

NOTE ON MODEL SPECIFICATION

The monthly income distribution contains a large mass at zero because many respondents are not yet earning. Such outcomes can alternatively be modeled using two-part (hurdle) models that separately estimate (i) the probability of earning and (ii) earnings conditional on earning. However, the unconditional linear ITT model in levels is used here because it directly yields the average income gain per student assigned to the program, which is the quantity required for cost-effectiveness analysis. This specification therefore provides the most transparent mapping between the estimated treatment effect and the program's per-student cost.

The income specification is estimated on the observed endline sample rather than the full randomized baseline sample, which is standard practice in RCT outcome analysis when earnings are only observed at endline.

DISTRIBUTION OF EARLY-CAREER INCOME

Income at endline is highly skewed because many respondents are still studying or have only recently entered the labor market. In the sample:

- median income is **₹0**
- mean income is approximately **₹3,743 per month**
- average work experience is **less than one year**

These patterns are typical in early-career samples and help explain the large mass at zero in the income distribution.

ATTRITION AND SAMPLE BALANCE

The baseline randomized sample includes 1,409 students (987 treatment, 422 control). A total of 676 respondents completed the endline survey. This corresponds to endline response rates of 45.7% in the control group and 48.9% in the treatment group.

Table A2. Endline Response Rates by Treatment Status

Group	Respondents	Response Rate
Control	193 / 422	45.7%
Treatment	483 / 987	48.9%

A regression of endline completion on treatment assignment shows no statistically significant difference in response rates (difference = 3.2 percentage points, $p = 0.27$). Standard balance tests across baseline characteristics (gender, marital status, number of children, and education level) also show no statistically significant differences between treatment and control groups among observed respondents. These results suggest that endline attrition was not systematically different across treatment arms, preserving the internal validity of the treatment–control comparison.

MECHANISMS: EMPLOYMENT AND EARNINGS

To better understand the drivers of income gains, expected income can be decomposed into employment and wage components:

$$E(\text{Income}) = P(\text{Working}) \times E(\text{Wage} \mid \text{Working})$$

The evidence suggests that Medha increases both:

- the probability of working
- earnings among those employed

This decomposition clarifies how improvements in early labor market participation and earnings jointly contribute to the overall intent-to-treat income effect used in the cost-effectiveness analysis.

LABOR MARKET DISPLACEMENT

Employment programs sometimes raise concerns about labor-market displacement, in which participants obtain jobs that might otherwise have gone to other workers. In such cases, part of the observed earnings gain could reflect transfer rather than net new economic output.

Several features of Medha's model suggest displacement is unlikely to explain a large share of the estimated impact. The program reduces frictions in the transition from education to work by improving career awareness, job search strategies, professional networks, and employer matching. These mechanisms are more likely to accelerate labor market entry and improve job matching than to reallocate existing jobs, particularly in India's expanding service economy and given extremely low female labor force participation.

As a robustness check, the sensitivity analysis applies proportional reductions to estimated earnings gains, including a scenario in which 50% of gains reflect displacement rather than net new output.

LINKING IMPACT ESTIMATES TO COST-EFFECTIVENESS

Because the income regression estimates the average income gain associated with program assignment, it provides the basis for comparing projected benefits with Medha's cost per student and estimating the program's benefit–cost ratio.

The next section describes how these income effects are projected forward over participants' working lives to estimate the present value of lifetime earnings gains and the program's benefit–cost ratio.

Projection method:

The endline survey captures participants early in their labor market journeys. To assess the program's long-term economic impact, the observed income differences are projected over the participants' working lives. The analysis employs a 20-year projection horizon and a 5% annual discount rate to calculate the present value (PV) of lifetime income gains.

Instead of relying on a single assumption about future earnings, three projection methods are used. These cover a range of plausible scenarios for how early-career income gains may develop over time, from a conservative constant-gap assumption to models that include employment changes and experience-based wage growth.

PERSISTENCE OF EARNINGS EFFECTS

A key uncertainty in projecting long-term income gains is whether the earnings advantage seen at endline endures over time. One possibility is that the income gap between treatment and control groups widens as participants gain more experience. Another possibility is partial convergence, where control-group students gradually catch up as they independently gain work experience.

The projection scenarios are designed to capture this range of possibilities:

- **Projection A** assumes the observed income gap remains constant over time, providing a conservative lower-bound estimate.
- **Projection B** incorporates observed employment and wage differences and allows earnings to grow with work experience using the estimated income–experience relationship.
- **Projection C** applies the treatment–experience interaction to illustrate a scenario in which the earnings gap widens with experience.

Projection A assumes that the observed income gap remains constant over time. Using a 5% discount rate over 20 years, this method emphasizes short-term earnings and helps prevent overestimating long-term effects if partial convergence happens between treatment and control groups.

Table A3. Key Projection Assumptions

Parameter	Value	Description
Projection horizon	20 years	Career earnings projection window
Discount rate	5%	Baseline real discount rate
Monthly income impact	₹1,799	ITT estimate from RCT regression
Program cost	₹27,500 ($300)	Cost per student served
Employment model	ITT estimate	Includes non-earners
Sensitivity tests	Multiple	Discount rate, decay, displacement

Projection A: Constant Income Gap (Central Conservative Estimate)

The most conservative specification assumes that the RCT income difference remains constant over time. The estimated treatment effect of ₹1,799 ($20) per month (₹21,588 ($235) annually)—which is statistically significant at the 5% level in the ITT regression—is projected forward without additional growth. Annual income differences are discounted at 5% and summed across the 20-year horizon.

Because this model relies only on the RCT intent-to-treat estimate and assumes no additional income divergence over time, it provides a lower-bound estimate of program impact.

Projection B: Employment and Wage Model (Structural Scenario)

To reflect how the program affects earnings, the second projection separates employment and wage effects using the identity:

E(Income) = P(Working) × E(Wage | Working)

Table A4. Decomposition of Observed Income Impact

Component	Control	Treatment
Employment rate	20.7%	25.3%
Mean monthly income among those classified as employed (including zero-earners within that group)	₹10,125 ($110)	₹13,422 ($146)

Although the employment difference is not statistically significant in the endline sample, this decomposition indicates that the estimated income effect results from both a higher probability of employment and higher earnings among those who are employed.

To project how earnings evolve with experience, we estimate an income–experience regression using the endline data. Monthly income is regressed on years of work experience, treatment status, and their interaction using ordinary least squares with batch/cohort fixed effects and standard errors clustered at the batch level.

$Income\_i = \alpha + \beta 1\ Experience\_i + \beta 2\ Treatment\_i + \beta 3\ (Experience\_i \times Treatment\_i) + \Sigma\ \gamma\_b\ Batch\_b + \varepsilon\_i$

β_1 captures the relationship between work experience and income for the control group, while β_3 captures any additional income growth associated with Medha participation as experience increases.

The estimates indicate that monthly income increases by approximately ₹549 ($6) for each additional year of experience in the control group. Medha alumni see an extra increase of about ₹433 ($5) per year of experience, suggesting a total monthly income growth of roughly ₹982 ($11) per year for the treatment group. The treatment–experience interaction is estimated with considerable uncertainty and is not statistically significant ($p \approx 0.82$), due to the limited range of work experience observed in the endline sample.

In the projection model, employment differences are held constant while wages grow with experience. Expected income for each group is projected annually, and income differences are discounted to present value.

Projection C: Experience-Driven Growth Scenario (Illustrative Upper Bound)

The third projection applies the income–experience regression more directly to illustrate how earnings trajectories might diverge under stronger assumptions about persistence. In this model, the income gap grows with experience according to:

Gap_t = 1,799 ($20) + 433 ($5) × (t − 1)

where *t* represents years after the endline survey. Annual income gains are discounted and summed across the 20-year horizon. Because the treatment–experience interaction is estimated with substantial uncertainty, this specification should be interpreted as an illustrative upper-bound scenario rather than a precise forecast of long-term wage dynamics.

PRESENT VALUE CALCULATION

For each projection, yearly income differences between treatment and control groups are:

1. Converted to annual income gains
2. Discounted to present value using a 5% real discount rate (base case)
3. Summed over a 20-year working horizon

The baseline analysis applies a 5% real discount rate, a standard assumption in economic evaluations of education and labor-market programs and broadly consistent with public-sector appraisal practices in South Asia. Sensitivity analysis also examines alternative discount rates of 3% and 10%.

The present value of lifetime earnings gains is calculated using the standard formula:

$$PV = \sum_{t=0}^{T} \frac{\Delta Y_t}{(1+r)^t}$$

where ΔY_t represents the annual income gain in year *t*, *r* is the discount rate (5%), *T* is the projection horizon (20 years), and t = 0 corresponds to the endline survey year.

The resulting present value estimates represent the total additional lifetime earnings attributable to the program per student served, which can then be compared directly with Medha's cost per student to estimate the program's benefit–cost ratio.

Cost-Effectiveness Results:

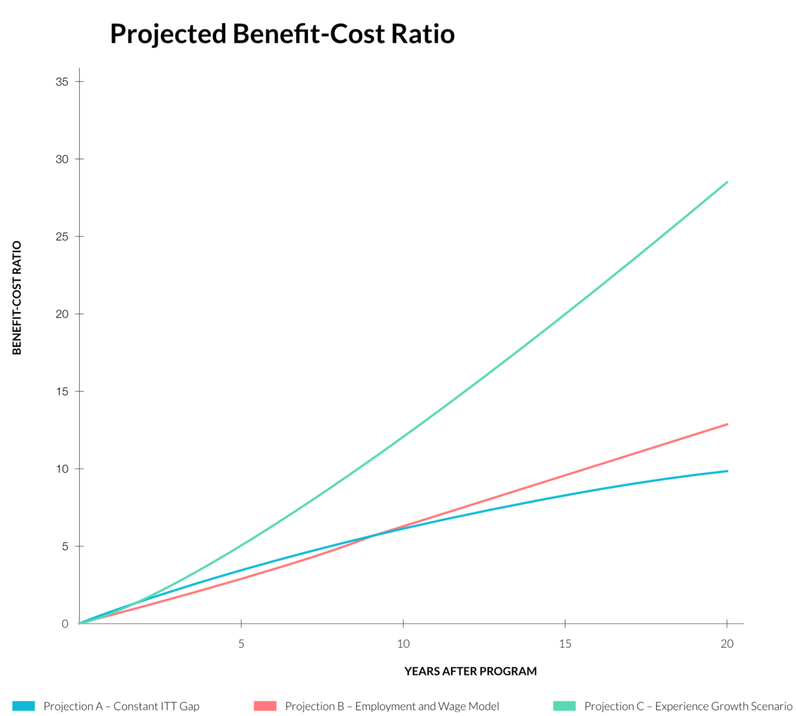
Using the projection models, we estimate the present value of lifetime income gains attributable to Medha's program. These gains are then compared with Medha's cost per student of ₹27,500 ($300), based on the most recent financial year's program delivery expenses. This amount includes both the direct costs of serving students and a proportional share of the organization's operating costs.

Table 1. Present Value of Lifetime Income Gains and Benefit–Cost Ratios

Projection	Present Value of Lifetime Income Gain (₹/$)	Cost per Student (₹/$)	Net Lifetime Gain per Student (₹/$)	Benefit-Cost Ratio
Projection A – Constant ITT Gap (Central Conservative Estimate)	₹269,034 ($2,934)	₹27,500 ($300)	₹241,534 ($2,634)	9.8×
Projection B – Employment and Wage Model (Structural Scenario)	₹353,713 ($3,858)	₹27,500 ($300)	₹326,213 ($3,558)	12.9×
Projection C – Experience-Driven Scenario (Illustrative Upper Bound)	₹780,937 ($8,516)	₹27,500 ($300)	₹753,437 ($8,216)	28.4×

Across projection scenarios, the program generates substantial increases in expected lifetime earnings relative to program costs. Under the conservative projection, each $1 invested generates roughly $10 in additional lifetime earnings.

Figure 1. Projected Benefit–Cost Ratio Over Time Across Projection Scenarios.



PAYBACK TIMELINE

To understand how quickly the program generates economic returns, the cumulative present value of income gains can also be examined over time. Table 2 shows approximate payback dynamics across the projection scenarios.

Table 2. Payback Timeline for Program Investment

Year	Cumulative PV Income Gain (A-C, ₹/$)	Payback / Benefit-Cost Ratio
Break-even point	₹27,500 ($300)	~1.3 years to payback
Year 3	₹58,789–₹72,479 ($641–$790)	2.1–2.6×
Year 5	₹93,465–₹136,264 ($1,019–$1,486)	3.4–5.0×
Year 10	₹166,697–₹331,161 ($1,818–$3,611)	6.1–12.0×
Year 20	₹269,034–₹780,780 ($2,934–$8,515)	9.8×–28.4×

BREAK-EVEN ANALYSIS:

At a 5% discount rate, the program reaches break-even after approximately 1.3 years (roughly 16 months). After this point, additional earnings represent net economic returns.

Uncertainty & Sensitivity Analysis:

Cost-effectiveness estimates depend on both statistical uncertainty in the estimated income impact and assumptions about how income evolves over time. Table 3 summarizes the main projection and sensitivity scenarios examined in this analysis.

Table 3. Summary of Cost-Effectiveness Scenarios and Sensitivity Tests

Scenario	Assumption	Benefit-Cost Ratio
Projection A	Central conservative estimate	9.8×
Projection B	Structural scenario	12.9×
Projection C	Upper bound illustration	28.4×
Discount rate	10% discount	6.7×
Fade-out	10% annual decay	5.0×
Fade-out	20% annual decay	3.1×
Displacement	50% displacement	4.9×
Combined stress test	20% decay + 50% displacement	1.6×

STATISTICAL UNCERTAINTY IN INCOME IMPACTS

The intent-to-treat income regression estimates a monthly income gain of ₹1,799 ($20) with a standard error of ₹909 ($10). This implies a 95% confidence interval ranging from approximately ₹17 to ₹3,581 per month. The relatively wide interval reflects substantial variation in early-career earnings, with many respondents still studying or only recently entering the labor market.

As an additional robustness check, excluding the top 1% of earners from the sample produces a similar treatment effect of approximately ₹1,315 per month, indicating that the results are not driven by a small number of unusually high earners.

To illustrate the implications of statistical uncertainty, the central conservative estimate (Projection A) is recalculated using the lower and upper bounds of the confidence interval.

Table 4. Sensitivity of Cost-Effectiveness Results to Statistical Uncertainty in Income Impacts

Scenario	Monthly Income Gain	Present Value of 20-Year Income Gain (₹/$)	Benefit-Cost Ratio
Lower bound (95% CI)	₹17 (<$1)	₹2,596 ($28)	0.1×
Point estimate	₹1,799 ($20)	₹269,034 ($2,934)	9.8×
Upper bound (95% CI)	₹3,581 ($39)	₹535,472 ($5,839)	19.5×

The point estimate and all sensitivity scenarios examined indicate that projected income gains substantially exceed program costs. The lower bound of the 95% confidence interval is ₹17/month, producing a near-zero BCR. This reflects the wider standard errors associated with the more rigorous batch-clustered specification rather than a substantive concern about program impact.

SENSITIVITY TO DISCOUNT RATES

Because projected income gains occur over many years, cost-effectiveness estimates are sensitive to the discount rate used to value future income. The baseline analysis applies a 5% annual discount rate, a standard assumption in economic evaluations of education and labor-market programs. Table 5 shows how results change under alternative discount rates using the central conservative projection (Projection A).

Table 5. Sensitivity of Cost-Effectiveness Results to Discount Rate

Discount Rate	Present Value of 20-Year Income Gain (₹/$)	Benefit-Cost Ratio
3%	₹321,175 ($3,502)	11.7×
5% (baseline)	₹269,034 ($2,934)	9.8×
10%	₹183,791 ($2,004)	6.7×

Even under a 10% discount rate, which heavily discounts future income, the estimated present value of lifetime income gains remains substantially larger than the program cost of ₹27,500 ($300). This indicates that the estimated economic returns are not driven by the choice of discount rate.

SENSITIVITY TO PROJECTION HORIZON

Because economic appraisal guidance recommends aligning the analysis horizon with the plausible duration of benefits, we test sensitivity to the projection horizon using the central conservative projection (Projection A).

Table 6. Sensitivity of Cost-Effectiveness Results to Projection Horizon

Projection Horizon	PV of Lifetime Gain (₹/$)	Benefit-Cost Ratio
3 years (early payback check)	₹58,789 ($641)	2.1×
5 years (short-term)	₹93,465 ($1,019)	3.4×
10 years (conservative)	₹166,697 ($1,818)	6.1×
20 years (base case)	₹269,034 ($2,934)	9.8×
40 years (full career)	₹370,430 ($4,040)	13.5×

SENSITIVITY TO PROJECTION ASSUMPTIONS

The projection scenarios presented earlier provide an additional sensitivity check by varying assumptions about how income evolves over time:

- **Projection A (Constant Gap)** assumes that the RCT income difference remains constant over time.
- **Projection B (Employment and Wage Model)** incorporates observed employment and wage differences and allows wages to grow with experience using the estimated income–experience relationship.
- **Projection C (Experience-Driven)** applies the treatment–experience interaction more directly to illustrate a scenario in which the income gap widens with experience.

Across these specifications, the estimated benefit–cost ratio ranges from approximately 10× to 28×, indicating that the program generates substantial economic returns even under conservative assumptions.

SENSITIVITY TO FADE-OUT IN THE TREATMENT EFFECT

A common concern in employment and training programs is that early earnings gains may fade over time as control-group participants acquire similar skills through work experience. To test this possibility, the analysis applies annual decay rates to the central conservative Projection A estimate of the monthly income effect.

Table 7. Sensitivity of Cost-Effectiveness Results to Fade-Out in the Treatment Effect

Annual decay in treatment effect	Present Value of 20-Year Income Gain (₹ / $)	Benefit-Cost Ratio
0% (constant gap)	₹269,034 ($2,934)	9.8×
5% annual decay	₹186,713 ($2,036)	6.8×
10% annual decay	₹137,325 ($1,498)	5.0×
20% annual decay	₹85,977 ($938)	3.1×

Even under a 10% annual decay assumption, the program generates a benefit–cost ratio of approximately 5.0× program cost. Under a more aggressive 20% annual decay, the projected return remains approximately 3.1× program cost, suggesting that the program remains cost-effective even if the treatment effect narrows substantially over time.

The central conservative projection (Projection A) reaches break-even after approximately 1.3 years (16 months), meaning that the observed income effect would need to persist for only a relatively short period after labor market entry for the program to recover its cost.

INTERPRETATION

Combined, these sensitivity checks indicate that the estimated economic returns are robust to statistical uncertainty, alternative discount rates, and different projections of long-term income growth. Although the precise magnitude of lifetime gains depends on these assumptions, all scenarios examined indicate that the projected income gains substantially exceed program costs.

Implications for Cost-Effectiveness and Economic Welfare:

The results suggest that career-readiness interventions that improve early employment and earnings can generate substantial economic returns for participants. Across projection scenarios, the present value of additional lifetime income attributable to the program ranges from approximately ₹269,034 ($2,934) to ₹780,937 ($8,516) per participant, relative to a program cost of ₹27,500 ($300) per student. This corresponds to an estimated earnings benefit–cost ratio of approximately 10× to 28×.

Another way to interpret these estimates is in terms of income generated per dollar invested. Under the conservative projection, each $1 invested generates approximately $10 in additional lifetime earnings (present value) for participants. Under the structural scenario, this rises to roughly $13 per dollar invested, and under the experience-growth scenario, it exceeds $28 per dollar invested.

These estimates reflect income gains rather than direct welfare gains. However, income is widely used as a proxy for improvements in economic welfare because higher earnings expand individuals' ability to consume, invest in education, and improve living standards over time.

BENCHMARKING AGAINST COMPARABLE PROGRAMS

Medha's conservative benefit-cost ratio of 9.8× compares favorably with those of other rigorously evaluated workforce and poverty interventions globally.

Year Up — RCT-based earnings analysis

Year Up is one of the most rigorously evaluated workforce programs in the US, with a randomized controlled trial of 2,544 young adults (ages 18–24) from low-income backgrounds showing average earnings gains of approximately $8,000 per year sustained through seven years of follow-up (Fein & Dastrup, 2022). Over seven years, every $1 invested in Year Up generated $2.46 in net benefits to society — a societal BCR of 2.5×. Medha achieves a 3.4× BCR at five years under its conservative projection, at $300 per student. Year Up's per-participant cost is approximately $28,000.

GiveDirectly — Unconditional cash transfers

GiveDirectly's unconditional cash transfer program is the standard development economics benchmark, with typical transfers of approximately $1,000 per recipient. Independent research estimates GiveDirectly generates approximately $2.50 in economic activity per dollar transferred, with long-run consumption and child mortality benefits raising its estimated impact in recent assessments (GiveWell, 2024; Haushofer & Shapiro, 2016). Medha achieves a 9.8× income multiplier at $300 per student — less than a third of GiveDirectly's transfer cost — and generates returns grounded in durable labor market improvements rather than one-time consumption effects.

GiveWell — Cost-effectiveness benchmark

GiveWell, the leading evidence-based charity evaluator, sets its funding bar at 8× its cost-effectiveness benchmark — calibrated to the cost of doubling consumption for someone living at the $2.15/day poverty line (GiveWell, 2024). Medha's 9.8× BCR — measured in terms of lifetime earnings gains per dollar invested — is consistent with and exceeds that threshold. GiveWell's benchmark is expressed in moral-weighted units that incorporate both income and health outcomes and apply discounting for recipient income levels; Medha's BCR is measured purely in lifetime earnings terms. A direct numerical comparison should be interpreted with caution.

J-PAL vocational training RCT review

J-PAL's review of 28 vocational and skills training RCTs finds mixed results overall, with the strongest outcomes in programs combining classroom instruction, practical experience, employer matching, and soft-skills development — Medha's core model (J-PAL, 2022). Colombia's Jóvenes en Acción program, one of the stronger individual RCT comparators, showed earnings and formal employment gains persisting up to eight years post-program, supporting the plausibility of Medha's projection assumptions (Attanasio et al., 2017)

Risks and Limitations

While the analysis provides evidence that Medha's program generates substantial earnings gains relative to its cost, several limitations should be considered when interpreting the results.

EARLY-CAREER MEASUREMENT

The endline survey captures participants at an early stage of their labor market trajectories. Many respondents are still studying or have only recently entered the workforce, so the observed outcomes reflect early-career earnings rather than mature earnings trajectories. As a result, the projection models necessarily rely on assumptions about how income differences evolve over time.

PERSISTENCE OF EARNINGS EFFECTS

A key uncertainty in any long-term projection is whether the earnings advantage observed at endline persists throughout participants' careers. Career-readiness interventions may generate lasting improvements in job-search skills, professional networks, and workplace productivity, but it is also possible that the income gap between the treatment and control groups narrows over time as control-group participants gain experience independently. To address this uncertainty, the analysis presents multiple projection scenarios, including a conservative model that assumes the income gap remains constant rather than widening.

UNCERTAINTY IN THE EXPERIENCE-GROWTH MODEL

The income–experience regression used in the projection analysis suggests that earnings increase with work experience and that treatment participants may experience somewhat faster income growth. However, the treatment–experience interaction is estimated with substantial uncertainty and is not statistically significant at conventional levels in the endline data ($p \approx 0.82$ with batch fixed effects and clustered standard errors), reflecting the limited range of work experience observed in the sample. For this reason, the experience-driven projection (Projection C) should be interpreted as an illustrative upper-bound scenario rather than a precise estimate of long-term wage growth differentials.

LABOR MARKET DISPLACEMENT

Employment programs sometimes raise concerns about labor market displacement—whether program participants obtain jobs that might otherwise have gone to other workers. While several features of Medha's model suggest that displacement may be limited, some degree of displacement cannot be ruled out. For this reason, the cost-effectiveness analysis includes sensitivity tests that apply partial displacement adjustments. Even under the most severe combined stress test (20% annual decay and 50% displacement), the estimated benefit–cost ratio remains positive across all projection scenarios examined.

MARGINAL COST-EFFECTIVENESS AT SCALE (SCALING CONSIDERATIONS)

The cost-effectiveness estimates use Medha's current average cost per student based on recent program delivery. As the program expands, marginal costs may differ depending on implementation models, geographic expansion, and participant characteristics. If additional students require more intensive support to achieve similar labor-market outcomes, the cost of generating equivalent income gains could increase. Conversely, expansion through institutional partnerships or public systems could reduce per-student delivery costs, as observed in Medha's collaborations with government education systems.

EXTERNAL VALIDITY

The estimates are based on a randomized controlled trial conducted among students participating in Medha's programs in specific institutions and regions. Labor market conditions, program implementation, and participant characteristics may differ in other contexts. As with any impact evaluation, the results represent the estimated effects for the population studied rather than a guaranteed impact in all settings. Income is measured using categorical band midpoints, which introduces a degree of measurement imprecision; treating non-earners as zeros is conservative and consistent with an intent-to-treat framework. Because the income analysis is based on observed endline respondents, the estimates assume that endline attrition does not differentially bias treatment and control comparisons.

INTERPRETATION OF WELFARE IMPACTS

Finally, the analysis estimates earnings gains rather than welfare gains directly. Higher income is widely used as a proxy for improvements in economic welfare because it increases individuals' ability to consume goods and services, invest in education, and improve living standards. However, the projections should be interpreted as estimates of additional lifetime earnings rather than precise measures of total welfare gains.

Taken together, these considerations highlight areas of uncertainty while also illustrating the robustness of the main finding: across a wide range of assumptions, the program's projected earnings gains substantially exceed program cost.