kusuma trust

LSE International Development

Evaluation of Kusuma Excellence Fellowships: Year 1

EXECUTIVE SUMMARY

January 2017

Introduction

- This report summarizes the first year results of the longitudinal evaluation of the Kusuma Excellence Fellowships (KEF) in Hardoi and Sambalpur. The KEF supports high-achieving students from poor backgrounds to progress into higher education by providing a stipend and a wide range of non-financial support schemes such as workshops and career counselling. A cohort analysis was launched for the 2015 intake, following students from their initial application to the first year grade 11 outcomes.

- This evaluation assesses the impact of the fellowship on student attainment, educational trajectories, and aspirations for their future and employment. To estimate the causal effect of the fellowship award, we use a "regression discontinuity design", comparing outcomes of applicants around the selection cut-off. A student who just made it above the selection cut-off and therefore received the fellowship is likely to be comparable to a student who just fell short of passing the cut-off and hence did not receive the fellowship.[1]

- In the following, we report the combined results from Hardoi and Sambalpur. Overall, program effects in both areas are of comparable magnitude suggesting that the evaluation is likely to be capturing real programme effects as opposed to inherent characteristics of the quality of schooling in each of the regions. We report differences explicitly whenever large discrepancies arise.

Impact on schooling outcomes

- In terms of impacts on schooling outcomes, we find that nearly all applicants continued schooling. Among the applicants surveyed (N=741), only 2 students dropped out in grade 11 (one in each program area). Both were unsuccessful applicants. One student dropped out due to illness; the other student reported financial constraints as the reason for non-enrollment.[2]

[1] For more information see Imbens and Lemieux (2008), "The regression discontinuity design – theory and applications", Journal of Econometrics, 142 (2): 611-614.

[2] Given the small sample size it is not possible to statistically attribute the differential dropout to the fellowship programme.

- The fellowship enables recipients to free up time for studies: Compared to non-recipients, fellowship recipients spend on average 6.6 hours less per week on non-academic work such as household chores or helping parents with work. Compared to the average hours spent on non-academic work among all students in our sample (20 hours per week), the reduction corresponds to a sizeable decrease by 33%.

- Fellowship recipients obtain more private tuition. About three quarters of all students complement their schooling with private tuition. Compared to non-recipients, however, fellowship recipients are 18% points more likely to receive private tuition at the end of grade 11.[3] Fellowship recipients also spend more money on tuition and receive, on average, 8.7 hours more instruction per week than non-recipients.

- The longer hours of study, however, do not translate into significantly higher reported grade 11 overall marks. Put differently, fellowship recipients and non-recipients in KEF perform equally well on the grade 11 exams.[4] Unlike grade 10 and 12 class exams, however, the grade 11 exams are not administered on the district-level, and students often progress automatically to class 12 (such as in Sambalpur). Unlike district-level exams, test scores arising from these individually administered exams may be harder to compare. Combined with the lower stakes associated with automatic progression to class 12, this may explain the lack of marked improvements in marks. For Sambalpur, data on test scores were unavailable, thus preventing us from conducting an evaluation of the fellowship's impact on student performance.

Impacts on values and attitudes

- Overall, and consistent with the evaluation of previous programmes and cohorts (the Kusuma Udayan Shalini Fellowship and the Kusuma Ratna Fellowship Programme), we find a trend towards changes suggestive of a higher valuation of education.

- Given the relatively short duration between the fellowship award and the conclusion of grade 11 (only 6 months between the post-notification survey in late October and the end of the academic year in May), however, most of these improvements remain small and statistically hard to detect. Attitudes and values evolve and change slowly, and we thus expect these effects to be larger in subsequent survey rounds.

- That said, we find an increase in the perceived value of completing higher education vs. only secondary school for fellowship recipients by 842 Rs. per month. This falls within the range of our previous estimates, and fellowship recipients perceive an increase of similar magnitude also for their peers, consistent with a general increase in the perceived value of education.

- Given the short duration between the fellowship award and the time of measurement, we find no statistically detectable changes in the students' plans about career choices, and their attitudes towards gender equality and perceived vertical mobility.[5]

Next steps

- Overall, the results suggest that the KEF has had positive impacts by easing constraints (e.g. access to additional tuition) and increasing the perceived value of education. Given the 6-month time period, however, the evaluation was only able to detect changes in short-run outcomes. Effects on values and attitudes may take longer to change.

- The results on grade 11 marks also point to the importance of improving the tracking for the grade 12 results by obtaining more reliable scores from official data which will likely reduce measurement errors. As grade 12 exams are centralized and a key determinant for the progression of students into further studies, obtaining precise measures is critical for assessing the effectiveness of the fellowship in enabling students to progress to higher education or entering the higher wage labour markets.

[3] The current survey data does not allow us to quantitatively assess whether the stipend was used to cover the tuition fees. We will collect data on how fellowship recipients spend their stipend in the subsequent round of the evaluation.

[4] We also find no statistically significant differences when looking at subject scores (e.g. Hindi, English and mathematics). Note that similar results were also found for grade 11 scores in previous evaluations of KRFP and KUSF.

[5] We measure attitudes towards gender equality by assessing the extent respondents agree or disagree with traditional gender roles at home and workplace. Perceived vertical mobility is measured by the extent students agree that parental and family background (as opposed to education and hard work) determine one's future career.

1. Background

In 2015, Kusuma Trust commissioned a longitudinal evaluation of the Kusuma Excellence Fellowship (KEF) in Hardoi and Sambalpur. The fellowship supports high-achieving students from disadvantaged backgrounds to progress into higher education by providing a stipend and a wide range of non-financial support schemes including workshops and career counselling. The cohort analysis is aimed at following the students from their initial application through their education until their graduation into the labour market.

The ongoing evaluation has currently collected data at three points in time: at time of application, post-notification and after the conclusion of grade 11. Table 1 summarizes the timeline of the data collection process. The grey fields show the planned future rounds that will track the performance of students in the grade 12 exam, and their progression either into higher education or the labour market.

Table 1. Timeline of data collection

Program area	Application	Post notification	Grade 11	Grade 12	Graduation
Hardoi	May 2015	Oct/Nov2015	May 2016 (end of term)		
Sambalpur	June 2015	Oct/Nov 2015	May 2016 (end of term)		

As part of the evaluation, we collected comprehensive data on the students' socio-economic background, student attainment, educational trajectories, time-use, and aspirations for their future and employment. We also collected attitudinal data to understand how the fellowships' non-financial support schemes (such as workshops) affect the students' values over gender equality and social mobility.

1.1 Methodology

The main challenge in estimating the causal effect of the KEF fellowship is the absence of a control group. Since the KEF is awarded to exceptionally meritorious students, those who receive the fellowship will already differ in substantive ways from those who did not receive the fellowship *at time of the award.* Table 2 shows the pre-existing differences at time of fellowship award between those who were selected and those who were not selected. Fellowship recipients have higher grade 10 marks, reflecting the merit selection rule of KEF. Interestingly, selected students in Hardoi are somewhat wealthier than unsuccessful applicants. (3548 Rs. in annual salary on average).[6] In Sambalpur, selected students come from poorer households.

Table 2. Grade 10 marks and household income by recipient status

		Grade 10	Income	N
Hardoi	Selected	80.65	33882.43	80
	Rejected	76.14	37430.77	327
	Sel - Rej	4.510***	3548.33*	407
Sambalpur	Selected	81.93	46186.05	86
	Rejected	75.53	54000.69	327
	Sel - Rej	6.399***	-7814.64*	413
Both areas	Selected	81.31	42021.95	166
	Rejected	75.84	44050.73	654
	Sel - Rej	5.47***		820

A simple comparison of outcomes between recipients and non-recipients will not allow us to disentangle the contribution of the fellowship program from the initial differences arising from awarding the fellowship to higher performing students. Since selected students were already high performing to start with, they may have performed equally well in absence of the fellowship. In order to estimate the causal effect of the fellowship, we therefore need to compare the outcomes of students with comparable background characteristics.

[6] This may be driven by the lack of available candidates to implement the merit-cum-need based rule: on average, applicants from households with higher income tend to have higher grade 10 marks.

We do so by using a *regression discontinuity design.* Intuitively, this research design compares only outcomes of applicants around the selection cut-off for the fellowship. While a high performing student ranked at the top of the selection list for admission to the fellowship is likely to be very different from a low performing student ranked at the bottom of the selection list, students around the cut-off ought to be very comparable. The only difference is that one student just made it above the cut-off and therefore received the fellowship, while the other student just fell short of passing the cut-off and hence did not receive the fellowship.

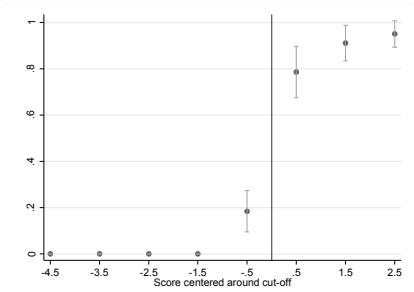
How the regression discontinuity design works – some intuition

Figure 1 illustrates the intuition behind the regression discontinuity design for the combined sample of Hardoi and Sambalpur.

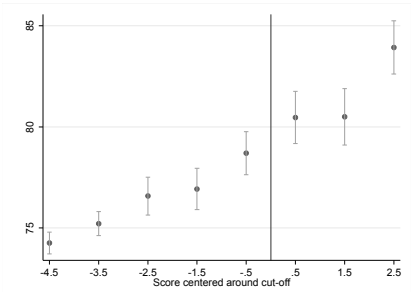
The fellowship programme selects students based on merit and need, ranking applicants using an entry score. The entry score is calculated based on the student's grade 10 (SSC) marks, as well as scores from a written test and interview. Figure 1 (a) shows the share of applicants who are selected to receive the fellowship (y-axis) as a function of their entry score (x-axis). The applicants are grouped into bins of scores and their averages are plotted as dots. The solid line at 0 marks the cut-off based on the selection rule. If the selection rule was perfectly enforced, all applicants to the right of the line would receive the fellowship, while all those to the left of the line would not receive it. As the figure shows, there was almost full compliance with the selection rule. Almost no applicants to the left (and hence below) the cut-off received the scholarships. Although few students do not receive the fellowship despite falling above the cut-off, the share of applicants who receive the fellowship indeed jumps discontinuously at the cut-off.[7]

Panel (b), (c) and (d) plot the average grade 10 marks, income and household sizes. Again, the solid line marks the cut-off: those to the left and hence below the line did not make the cut-off, while those above the line did. Clearly, students with stellar grade 10 marks (e.g. those above 85 to the very right) who received the fellowship will be very different from students who just made the minimum eligibility score (e.g. those at the very left) and did not receive the fellowship. The key to the *regression discontinuity design*, however, is to compare students *just* around the cut-off demarcated using the vertical line. As Panel (b) shows, the relationship between marks and the entry scores is smooth around the cut-off. The confidence intervals are overlapping, suggesting that there is statistically no discontinuity as observed in Panel (a). This implies that students very close to the cut-off are likely to be comparable to each other. Indeed, as Panel (c) and (d) confirm, students around the cut-off have, on average, not only similar grade 10 marks but also similar levels of household income and household sizes. This, in turn, implies that any discontinuous change in outcome variables at the cut-off mirroring the discontinuity in Figure 1 (a) can be causally attributed to the fellowship.

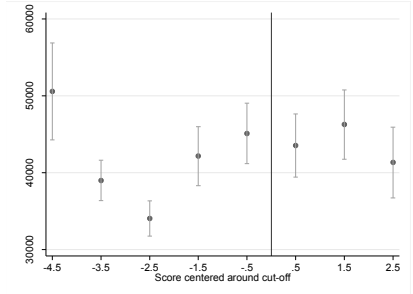
Figure 1. Probability of selection and entry score - Pooled



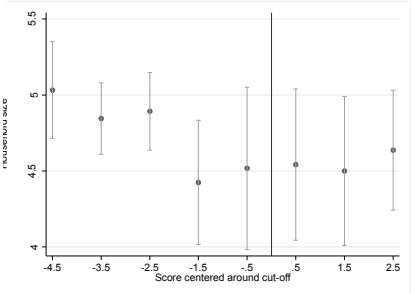
(a) Probability of selection



(b) Grade 10 marks



(c) Annual household income



(d) Household size

[7] Non-compliance can arise if the selection committee basis the final decision on other criteria and characteristics that are not captured in the quantitative selection scores. This slight non-compliance poses no threat to our research design. We find no evidence for strategic manipulation around the cut-off and use a fuzzy regression discontinuity design to correct for the imperfect compliance.

2. Programme effects

2.1. Impact on schooling outcomes

Progression and drop-out

A central objective of KEF is to enable students to progress into higher education. Completing higher secondary school (grade 11-12) is a critical step towards achieving this goal. We therefore first examine the dropout rates for grade 11. Table 2 reports the dropout rate by program area and fellowship status. Nearly all applicants continued schooling. Among the N=741 applicants surveyed in the latest round, only 2 students reported to have dropped out in grade 11. These two dropouts are evenly distributed across both program areas and were both unsuccessful applicants. One of the students dropped out due to illness, and the other student reported financial constraints as the reason for non-enrollment.

Overall, however, the drop-out rate in grade 11 is minimal. While dropouts were only limited to non-recipients, the numbers are too low to allow for a statistical assessment of whether the fellowship has helped reduce the dropout rate. The low dropout rates, however, do suggest that keeping students in higher secondary school is not a critical constraint.

Table 3. Dropout rates by program area and recipient status

	Dropouts from school			
	Hardoi	Sambalpur	Total	Rate
Fellows	0	0	0	0%
Non-recipients	1	1	2	0.27%

Time use of students

We now move towards examining schooling outcomes. While virtually all students of the 2015 cohort remained in school, the fellowship may have affected the intensity of study or the schooling performance, e.g. as measured by the grade 11 exam marks. As part of the evaluation, we collected detailed time-use data for for all students. Specifically, we ask each respondent to report the number of hours devoted to particular activities on a typical weekday or weekend. Using these reports, we then compute the total hours for each actvitiy per week.

A major impediment to improving schooling outcomes is student absenteeism and the lack of study time. While the reasons are varied, one of the main contributors are domestic chores:: students may be too distracted to find time to attend school or revise. While the share of students who report to engage in formal part-time work in the past year is low (10 students in Hardoi, 2 students in Sambalpur), students indeed spend substantial time on chores and non-academic work. On average, students report to spend nearly 2.5 hours per day on non-academic work inside and outside home. Over the weekend, this increases to 4.5 hours.

We find that the KEF eases the students' time constraint by reducing the hours spent on non-academic work. Fellowship recipients reduce the time spent on non-academic work by 6.6 hours per week (Table 4, Column 1). The time that is freed up is not going towards leisure activities such as watching TV, socialising with friends or surfing on the internet (Column 2). Instead, we find that fellows use the additional time to make use of private tuition. Fellowship recipients are 18.6% points more likely than non-recipients to complement their studies with additional tuition at the end of grade 11. This implies that fellows use the additional free time to study more: compared to a non-recipient, the increase corresponds to 8.7 hours of more instruction per week.

Impacts on grade 11 marks

Given that fellows spent longer hours studying, we may expect them to perform better than non-recipients in the grade 11 exam. Interestingly, we find no strong evidence for this based on self-reported marks: statistically, we cannot reject that fellowship recipients and non-recipients perform equally well on the grade 11 exam. The difference on average is only 1 mark – too small to statistically conclude that the difference is driven by the fellowships' impact (Column 4).

There are several explanations for this perhaps puzzling result. First of all, unlike grade 10 and 12 exams, grade 11 exams are not centralized and students often progress automatically to class 12 (such as in Sambalpur). Unlike centralized (district-level) exams, test scores arising from these individually administered exams may be harder to compare. These noisier test scores, combined with the lower stakes associated with automatic progression to class 12, may explain the lack of marked improvements in marks.[8] The second possible explanation is systematic measurement error. Since grade 11 marks are self-reported, unsuccessful students may misreport their mark.

[8] For Sambalpur, data on exam scores was incomplete, thus preventing us from conducting a systematic empirical evaluation.

Although we attempted to mitigate concerns over selective misreporting by presenting the survey as a general study of education and schooling opportunities that is independent of KEF, the concern that students systematically misreport particularly low marks remains. This type of measurement error is a general concern in survey data. For the grade 12 exam to be taken next year, we therefore aim to obtain these scores from administrative sources.

We conclude the discussion on schooling outcomes by summarizing breakdown by program area in Table 4. The exact specification is described in the notes below the table. The results are similar across both study sites. For the grade 11 marks, we only have the results for Hardoi as we are still awaiting the data for grade 11.

Table 4. Time use and schooling outcomes

	(1) Hours p.w. non-academic work	(2) Hours p.w. leisure	(3) Receives tuition	(4) Hours p.w. tuition	(5) Grade 11 marks
Pooled	-6.648***	-1.420	0.186*	8.759***	
Hardoi	-8.108**	-5.692	0.338**	9.999***	1.447
Sambalpur	-8.728*	5.261	0.095	9.298**	

Reporting the coefficients of a fuzzy regression discontinuity design with quartic polynomial forcing function, controlling for income, gender and stream of student. Standard errors are clustered at the individual-level, reporting significance of treatment estimate *<0.1, **<0.05, ***<0.01

2.2. Impact on perceived returns to education

Consistent with the evaluation of previous programmes and cohorts (KUSF and KRFP), we find a trend towards changes suggestive of a higher valuation of education. In Table 5, we report the estimated perceived returns from completing higher education vis-à-vis lower secondary school, as measured in gains in monthly entry salary in the first 5 years of entering the job market.

Although insignificant, the results do point to a trend towards an increase in the perceived valuation of education (Column 1): fellowship recipients perceive an increase in the value of education by 842.56 Rs. on average. Notice that this increase, though currently statistically indistinguishable from zero, is close to what we have documented in previous evaluations in 2011 and 2013 for KUSF and KRFP.

The difference however lies in the timing: in the previous evaluations, we collected snapshots of all running batches. Our sample therefore included students that were exposed to the fellowships for up to 2 years. As Table 1 showed, the time window between notification is quite short. To the extent that values and beliefs take time to change, we may expect the effects on such subjective measures to manifest over time.

Table 5. Perceived returns to education in comparison

		Past evaluations	
	(1) Higher education – secondary school	(2) KUSF 2011	(3) KRFP 2013
Pooled	842.56	1369***	1609***
Hardoi	382.70		
Sambalpur	536.66		

Reporting the coefficients of a fuzzy regression discontinuity design with quartic polynomial forcing function, controlling for income, gender and stream of student. Standard errors are clustered at the individual-level, reporting significance of treatment estimate. *<0.1, **<0.05, ***<0.01

2.3. Impact on values and attitudes

As mentioned in previous subsection, the short time horizon between the notification and the survey implies that there was relatively little time for the fellowship to induce any attitudinal and value changes, e.g. through the workshops offered.

As part of the survey, we asked students a range of questions relating to the traditional gender role model. Questions covered the role of women within the household and their participation in the labour market. To illustrate, a question e.g. would ask the student to say whether the men, the women or both should be responsible for earning money. We cover a wide range of areas (e.g. who should bring up children, do household chores etc.) to compute an index of gender equality based on 7 sub-items. This survey module has been adapted from the work by Bandiera et al. (2015) and tailored to the KEF context.

We also adopted a module from the British Social Attitudes Survey to elicit beliefs about social mobility. For example, we ask students to state their level of agreement to statements such as "my parent's level of education will influence where I get in life" or the "family background significantly influences an individual's chances of doing well". We use these measures to compute an index of social mobility.

The results are reported in Table 6. We find no statistically discernible impact on the gender equality and social mobility indices. Six months into the fellowship, fellowship recipients are not more likely to share more equal views on gender issues or see higher levels of social mobility.

We do, however, find that the fellowship has increased the subjective wellbeing of fellowship recipients in the short-run. When asked "all things considered, how satisfied are you with your life as whole these days", fellowship recipients provide an average rating that is 1.1 points higher than those of non-recipients (on a scale of 1 to 10). When asked the same questions for the future, we find no difference between recipients and non-recipients.

Table 6. Values and attitudes

	(1) Gender equality	(2) Social mobility	(5) Life Satisfaction – Now	(5) Life Satisfaction – 5 years	(5) Life Satisfaction - 10 years
Pooled	-0.023	0.119	1.127**	0.220	0.397
Hardoi	0.043	0.505	0.931*	0.125	0.358
Sambalpur	-0.054	0.051	0.507	-0.735	-0.778

Reporting the coefficients of a fuzzy regression discontinuity design with quartic polynomial forcing function, controlling for income, gender and stream of student. Standard errors are clustered at the individual-level, reporting significance of treatment estimate. *<0.1, **<0.05, ***<0.01

3. Next steps

In this report we summarize the progress in the ongoing evaluation of the KEF fellowships in Hardoi and Sambalpur. Overall, the results suggest that the KEF has had positive impacts by easing constraints (e.g. access to additional tuition) and increasing the perceived value of education. Given the 6-month time period between the baseline and follow-up survey, however, the evaluation was only able to detect changes in short-run outcomes. Effects on values and attitudes may take longer to change.

The results on grade 11 marks also point to the importance of improving the tracking of grade 12 results next year by obtaining verifiable scores from official data that will likely reduce measurement errors. As grade 12 exams are centralized and a key determinant for the progression of students into further studies, obtaining precise measures is critical for assessing the effectiveness of the fellowship in enabling students to progress to higher education or entering the higher wage labour markets.

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