Who Benefits Most? Examining the Heterogeneous Impact of a Need-Based Grant Program in Jamaica

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Abstract

This paper examines the heterogeneous impact of need-based grant funding on students' academic performance at a leading university in the Caribbean. In particular, using administrative student-level data, we examine the marginal effect of awarding a $500US grant each year to needy student loan borrowers, estimating the grant effect across students' gender, past performance, high school rank, starting age, commuting status, field of study, living condition, consumption level, and per-capita income. Employing a novel IV-DID design, the study instruments for grant receipt by leveraging a policy reform that expanded access to college financing for students on welfare. We find robust evidence that the need-based grant significantly improved college students' outcomes, with the greatest benefits observed among on-campus residents, recent high-school graduates, males, younger students, higher achievers, and those with greater financial need.

Keywords: Need-Based Grant; Academic performance; GPA; Graduation
JEL Codes: D04, H52, I22, I23, I28

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[*]All remaining errors are our own. Declarations of interest: none.

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1. Introduction

Several studies have shown that need-based grant funding improves students' academic outcomes, leading to higher college enrollment, grade point averages (GPAs), college persistence, graduation rates, and post-college labor market earnings (Bettinger, 2015; Denning, Marx, & Turner, 2019; Eng & Matsudaira, 2021; Pandey & Indrakanti, 2017; Wright, 2021). In addition, some studies have concluded that need-based grant programs likely reduce inequality in college attainment and post-college earnings (Bettinger, Gurantz, Kawano, Sacerdote, & Stevens, 2019; Goldrick-Rab, Kelchen, Harris, & Benson, 2016). While the literature clearly documents the positive impacts of providing grant funding to needy students, few studies have examined the heterogeneous effects of these programs on students' academic outcomes, and have found mixed results.[2] Consequently, there is limited empirical evidence on the socio-economic attributes of the students who benefit most from need-based financial aid. This evidence is particularly scarce in developing countries where empirical evaluations of college financing programs has severely lagged behind.

In this paper, we examine the heterogeneous impact of need-based grant funding on students' academic performance at the leading university in the Caribbean. In particular, extending Wright (2021), we estimate the impact of the need-based grant across various categories such as gender, past performance, high school rank, starting age, commuting status, field of study, living condition, consumption level, and per-capita income to identify the students who benefit most from receiving this funding. This is done using an instrumental variable (IV) - difference in differences (DID) design, where the first stage leverages a policy reform that increased access to need-based college financing for students on public welfare.

This study makes two important contributions to the literature. First, this is one of the few studies to estimate the impact of need-based grant funding on students academic outcomes in a developing country. This paper broadens the existing literature by being the first to examine the

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[2]For instance, several studies have found that need-based grant programs have a larger impact on lower-income (Anderson, 2020; Bettinger et al., 2019; Murphy & Wyness, 2023) and higher-ability (Murphy & Wyness, 2023) students. However, mixed evidence is found for analysis across genders (Dynarski, Page, & Scott-Clayton, 2023).

heterogeneous impact of need-based grant funding in a developing country, focusing on a detail set of individual- and household-specific pre-treatment covariates.[3] Second, our study examines the heterogeneous impact of a need-based grant program on an interesting subset of students who utilized a government subsidized loan to pay their tuition. This is an ideal environment to examine the effects of the grant program since these dollars cannot be utilized to cover tuition expenses.

We find consistent evidence that the need-based grant program significantly improved students' academic outcomes, with the largest benefits obtained by students who live on campus, recent high-school graduates, males, higher achievers, and those with greater financial need. In addition, the grant had a minimal impact on low-achieving students, commuters, and those who delay their entry to college. These results suggest that the government can better target grant recipients to maximize the use of these public funds.

2.   Institutional Background

The Caribbean region has several colleges and universities, but the University of the West Indies (UWI) stands out as the oldest and the most prestigious tertiary institution. The UWI operates five campuses across the Caribbean and serves approximately 50,000 students who may choose from 200 majors offered by one of the seven faculties, namely: Social Sciences, Science and Technology, Humanities and Education, Medical Sciences, Law, and Sports (Wright, 2024).

The Student Loan Bureau (SLB) is the primary source of college financing in Jamaica. The main facility that is offered by the SLB is a means-tested tuition loan that targets needy students based on their household income, living conditions and assets.[4] The SLB also provides additional financial assistance to the poorest students, a non-repayable need-based grant, that is awarded to the lowest quartile of applicants in the means-test score distribution. This grants amounts to about

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[3]To the best of our knowledge, Wright (2021) is the only previous study to evaluate a need-based program in a developing country. Our study is simply an extension of that work.

[4]During the sample period 2006-2016, the recipients of the student loan were required to repay the loan at an interest rate of 9% after a moratorium of six months (Wright, 2021). Today, the loan has an interest rate of 7.5% during a fourteen months moratorium period and 9.5% thereafter. This is the most affordable tuition loan option available to college students.

$500US annually and is intended to cover the cost of books, travel, and other living expenses (Wright, 2024). This system ensures that most students can access tuition funding through loans, while a smaller, more needy group receives a grant to ease their financial burden. However, while students must apply for the tuition loan, they do not apply for the grant program and are often unaware of its existence unless they receive one of the awards several weeks into their first semester.[5]

Initially, the SLB required students to provide two guarantors, with both the students and the guarantors undergoing interviews to prevent misrepresentation. This procedure was part of the loan application process to verify the eligibility of the guarantors and the accuracy of all information provided to prevent fraud. However, in 2012, the SLB revised its policy to simplify the college financing process, especially for students from households on social welfare. During this process, the SLB modified their means-test funding formula to incorporate household consumption information for each applicant. The SLB also signed an information sharing agreement with the Ministry of Labour and Social Security (MLSS) that enabled them to verify applicants welfare status and students on welfare were now required to provide only one guarantor. Since guarantors are only able to support one student, this change reduced the challenges faced by low-income students and likely increase the number of applications from this group. In addition, the reform improved the SLB's ability to target low-income students, likely increasing the number of welfare recipients who qualify for the grant program.

2.1. Data

Since this paper extends the grant program analysis in Wright (2021), we use the same student-level administrative dataset that was utilized in that study. In particular, the data was obtained from the University of the West Indies and the Student Loan Bureau. Given our identification strategy, we restrict our sample to the UWI students who applied for the means-tested tuition loan. This dataset include details on various student-level covariates such as gender, age, high

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[5]This grant program is not publicly advertise, and as such, students do not anticipate this funding. Consequently, the program does not affect students' decision regarding entry, major selection, university choice, or enrollment, all of which must be made by the start of the semester.

school attended, past performance on standardized exams, welfare status, grant award status, field of study, college start year, commuting status, credits attempted, grade point average (GPA), and year graduated. The data also contain the information students provided while applying for loan funding, such as householder's income, asset ownership, and housing details, such as the type of toilet, the materials used in the outer walls, access to drinking water, and ownership or rental type information. To avoid selection bias concerns, we focus on students performance during the first two semesters and graduation outcomes. Our full sample includes 19,695 observations.[6]

The descriptive statistics are presented in Table 1. They show that for the students in our full sample, 28 percent are males, the average starting age was 19.52 years, and average daily per-capita household income was $7.34US. The table also shows clear differences in the welfare status and academic outcomes for treated and untreated students.

3. Empirical Model

In this paper, we employ an instrumental variables (IV) design where the effect of the grant program is identified from plausibly exogenous variation in grant receipt due to changes in the eligibility criteria for student financing. Consequently, the first stage regression leverages the policy reform to instrument for grant receipt using the difference-in-differences approach (DID).

This model can be expressed as follows:

$$Grant_i = \gamma_1 + \gamma_2 Welfare_i + \gamma_3 Welfare_i * Post_t^{2012} + X_i\pi + \tau_t + \varepsilon_i, \tag{1}$$

$$Y_{it} = \beta_0 + \beta_1 \hat{Grant}_i + X_i\theta + \tau_t + \eta_{it}, \tag{2}$$

where i indexes student and t indexes academic year. The binary variables $Grant_i$ takes the value 1 if the student receives a grant, $Welfare_i$ takes the value 1 for students on welfare, and $POST_t^{2012}$ takes the value 1 for all years following the policy change in 2012. The dependent variable Y_{it} denotes the academic outcomes of interest, including GPA and credits attempted in the first year,

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[6]We observe 10,003 students in the first semester and 9,692 students in the second semester. We find that the grant did not affect the decision to stay for the second semester.

and binary variables for completing college on time and within five years. The model also includes several individual- and household-specific covariates (X_i) such as gender, starting age, household daily per-capita income, high school performance, college admission score, location fixed effects, tuition, and enrollment status.

In the first stage model, the parameter γ_3 captures the effect of the policy change on the probability that welfare recipients are awarded a need-based grant. Causal identification requires that, conditional on X_i, the reform had no direct impact on students college outcomes and must therefore be independent of η_{it}. Since students cannot directly apply for the grant program (or do not know it exists) and the reform was mainly an internal administrative change in the eligibility rules for the grant program, the policy change is plausibly exogenous. The parameter of interest, β_1, shows the impact of the grant on the academic performance of the students who were induced into the grant program due to the policy reform in 2012.

4.   Result

In this section, we discuss how the need-based grant impacted students who were induced into the program by the 2012 reform. Additionally, we examine the effects of the program across several pre-treatment student- and household-level covariates. We focus on four main outcome variables: GPA and credits attempted during the first academic year, as well as binary variables for graduating on time and within five years. These results are presented in Tables 2, 3, and 4.

We begin by examining the plausibility of the identifying assumptions of the first-stage DID model and the IV model more generally. One of the key identifying assumptions of the IV model, the exogeneity condition, requires that the instrument (the program reform) have no impact on students' college outcomes, except through its effect on treated students grant eligibility. This condition is plausibly satisfied in this context because the administrative changes were not reported to the public, students are generally unaware of the grant program, and the grant selection criteria are only known by program administrators.

Next, the relevance condition of the IV model requires that the reform has an impact on the likelihood that a grant is awarded to students on welfare. We utilize the DID model to identify the effect of the reform on welfare students. Figure 1 shows the dynamic effects of the grant program reform on the likelihood that students on welfare are awarded a need-based grant. As expected, the results show that the program reform had no impact on grant eligibility in the pre-reform period, but it increases grant eligibility during several of the post-reform years. More specifically, testing the null hypothesis that the pre-period estimates are jointly zero yields a p-value of 0.80, in support of the parallel pre-trend assumption. Across Tables 2 to 4, we present the first stage treatment effect on grant eligibility in the bottom panel. These estimates show that across the various subgroups, the reform increased grant eligibility by 2 to 21 percentage points, with an average of 13 percentage points in the aggregate model. In the bottom panel, we also show that the F-statistics on the excluded instruments for each model is larger than the benchmark of 10 discussed in the IV literature.

4.1. Heterogeneous Effects of Need-Based Grant Funding: Gender and Academic Preparation

In Table 2, we present the overall impact of the need-based grant on students outcomes, as well as the impact of the program by gender, past performance, and school rank. The results indicate that the need-based grant program significantly improved the college outcomes of the students who were induced into the grant program. In particular, while the need-based grant had no impact on the number of credits attempted, it increased first semester GPA by 0.22 points, on time graduation rates by 13 percentage points, and the likelihood of graduating within 5 years by 19 percentage points.[7]

The results further indicate that the grant had a considerably larger impact on male students, who saw increases in their first-year GPA and on-time graduation rates that were three times

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[7]We also estimated the heterogeneous effects of the grant program at another large university in Jamaica. We found that the results are consistent when similar variables of interest are available. For brevity, these results are omitted but are available upon request.

higher than those of female students. Similarly, the GPA and on-time graduation benefits for high-achieving students were about twice as large as those for low-achieving students. However, while the grant helped more high-achieving students graduate on time, it enabled more lower-achieving students to complete college within five years.[8] This indicates that policymakers can use need-based grants to improve graduation timelines, particularly for low-achieving students.

Lastly, we created three sub-samples by dividing the high school rank distribution into terciles. The results indicate that the need-based grant was most effective at improving the academic outcomes of students who attended high schools in the middle tercile of the rank distribution, and to a lesser extent, those in the top tercile. For instance, students from middle tercile high schools experienced a 0.37-point increase in their first-year GPA, an 18 percentage point increase in on-time graduation, and a 44 percentage point increase in their five-year graduation rate. In contrast, grant recipients from the top high schools saw a much smaller increase in first-year GPA and an 18 percentage point increase in on-time graduation rates. Furthermore, those from the lowest tercile of schools showed no improvement in their academic outcomes.

4.2. Heterogeneous Effects of Need-Based Grant Funding: College-Level Decisions

Next, we examine how the impact of the grant program varies by college students' enrollment status, commuting status, and faculty of study. These results are presented in Table 3 for the same outcomes of interest.

The results show that the students who entered college shortly after finishing high school benefited more from the need-based grant than those who delayed entry to college. For example, the high school graduates who transitioned to college immediately and received the need-based grant experienced a 0.25 points increase in their first-year GPA, an 18 percentage points increase in on time graduation rate, and a 20 percentage points increase in the likelihood of graduating within

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[8]These results indicate that high-achieving students who did not receive the grant eventually catch-up to their treated counterparts and graduate within 5 years. On the other hand, low-achieving students who did not get the grant never catch-up to their treated counterparts even within 5 years.

five years. On the other hand, the need-based grant had no impact on the academic outcomes of students who delayed their college entry.[9]

The finding also indicate that students residing on campus benefit up to three as much from the need-based grant as those who commute for classes. In particular, the on-campus students who received the need-based grant saw a GPA improvement of 0.33 points and on-time graduation rates increased by 0.24 percentage points. In comparison, the GPA and on-time graduation rate of treated commuting students increased by 0.17 points and 0.08 percentage points, respectively.

Lastly, the results suggest that the grant had a heterogeneous impact on student outcomes across different field of study. For instance, the students in the social sciences experienced the largest GPA increase from receiving the need-based grant (0.43 points), followed by the students taking courses in science, technology, or medical science (0.16 points). We also found that the need-based grant increased the likelihood of graduating on-time by 33 percentage points for students in the Faculty of Social Sciences, but it did not have an impact on this outcome for students in other faculties. Finally, the results indicate that the grant program increased the 5 year graduation rate of all treated students by about 19 to 26 percentage points across the various fields of study.

4.3. Heterogeneous Effects of Need-Based Grant Funding: Household Economic Condition

In this section, we assess how students' household economic well being influence the impact of the need-based grant on their academic outcomes. Each student who apply for the student loan program must complete an extensive questionnaire and provide detailed information on their household. We use the questionnaire responses to create three measures of economic well being: Daily Per-Capita Income, Durable Goods Consumption, and a Multi-Dimensional Poverty Index. These results are presented in Table 4.

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[9]There are several plausible explanations for this finding. First, the students who delay entry may have accumulated resources to offset their college expenses and as such, the grant offered little additional benefits. Second, stronger students may transition to college immediately, while weaker students delay and retake exams to meet university entry criteria. If this holds true, then this result is similar to those discussed for high and low achievers.

To create our first measure, we use the following formula $\frac{\sum_{i=1}^{q} w_i}{365*q}$, where i indexes each family member, q is the household size, and w_i is the income accumulated by person i. We use this variable to divide the distribution into terciles.[10] The estimates in Table 4, columns 1-3 show that the grant had a larger impact on students from needier families. For instance, for students from households in the lowest income tercile, the grant increased the number of credits attempted by 0.86 per semester, the likelihood of graduating on time by 13 percentage points, and the likelihood of graduating within 5 years by 35 percentage points. In contrast, for students from households in the middle income tercile, the grant increased their on-time graduation rate by 10 percentage points—though this result was not statistically significant—and raised their 5-year graduation rate by 47 percentage points. Lastly, the estimates show that the grant had no impact on the students from the upper tercile.

Next, to create a durable goods consumption index, we create six dummy variables that take the value 1 if the students' household does not own a television, air conditioner, electric/gas stove, washing machine, computer, or car. This index captures the deprivation of essential household durable goods and ranges from 0 (full ownership) to 6 (no asset ownership). At the median, students were deprived of 3 assets in their household. Using this variable, we divide the distribution into three sub-groups by classifying those lacking 2 or fewer assets as households with high durable consumption, those deprived of 3 assets as having medium durable consumption, and those deprived of 4 or more assets as having low durable consumption. Overall, the results in columns 4 to 6 suggest that the grant had a larger impact on the students from households that were more deprived of various household assets. In particular, while the grant increased the GPA, on-time graduation rate, and 5-year graduation rate of students with low and medium durable consumption, it had no impact on the students whose household were least deprived of these important assets. These results similarly indicate that needier students benefited more from receiving the grant.

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[10]While per capita family income is one of the key factors determining grant eligibility, it is not the sole determinant. As such, for students in the lower, middle, and upper income terciles, 57%, 14%, and 5% received the need-based grant, respectively. These statistics suggest that the estimates will be less precise at higher points in the income distribution. However, the middle and upper tercile estimates are only slightly noisier than the lower tercile.

Lastly, we create a multi-dimensional poverty index (MPI) to more effectively identify the neediest students. The main advantage of this approach is that it can identify the students who are most deprived of important necessities not limited to household income. We focus on three equally weighted dimensions based on the household's ability to generate sufficient income, household assets, and the physical characteristics of the students' house. We discuss the construction of the index in more details in Online Appendix B. The MPI ranges from 0 to 1, with 0 assigned to households with no deprivation and 1 assigned to households that are deprived on all indicators. The estimates in columns 7 and 8 of Table 4 indicate that the students with an MPI index score above the median (more deprived) benefited more from the intervention than those with scores below the median. Specifically, the more deprived students experienced an increase in their GPA, on-time graduation rate, and 5-yr graduation rate. However, the grant had an insignificant effect on the academic outcomes of students who were less deprived on this multi-dimensional measure of need.[11]

5. Conclusion

In this study, we examine the heterogeneous impact of a need-based grant on Jamaican students academic performance. This context is interesting because all students utilized a need-based tuition loan to pay for college, but only the neediest students are awarded grant funding. This enables us to examine the marginal effect of a need-based grant on students who are not concerned about out-of-pocket tuition expenses. In addition, this study identifies the student- and household-level characteristics of those who benefited most from receiving the grant, marking one of the first attempts to document these effects in a developing country.

We find consistent evidence that the need-based grant program significantly improved students' academic outcomes, with the largest benefits obtained by students who live on campus, recent high-school graduates, males, higher achievers, and those with greater financial need. This result shows

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[11]In Appendix A, we show the estimated impact of the grant in various sub-component of the MPI. The results also show that the grant had a larger impact on the students who experienced worse living conditions (poor toilet facilities, less access to drinking water, inferior housing) and little to no impact on those exposed to better living conditions.

that policymakers can better target need-based grant support to maximize the benefits of these public funds.

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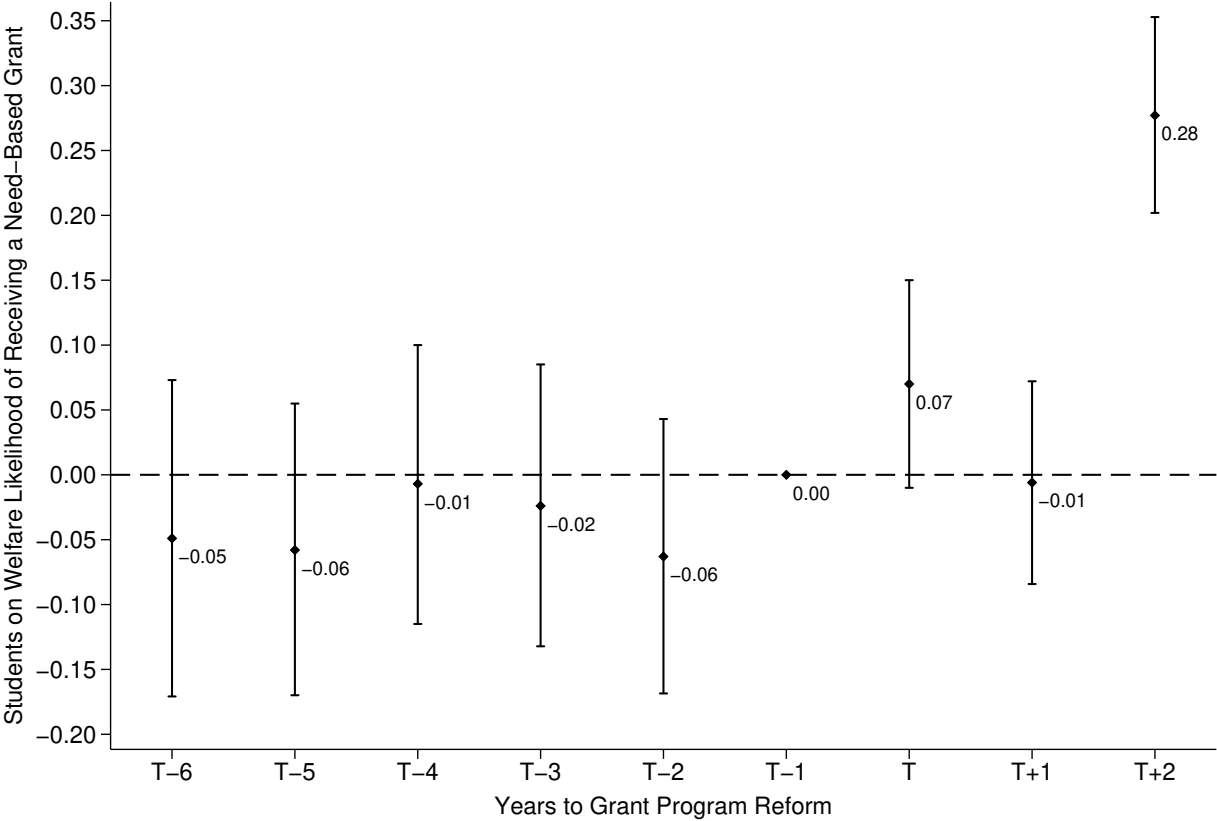
6.   Appendix: Figures and Main Tables

Fig 1: Impact of Grant Reform on Welfare Students' Likelihood of Receiving a Grant

Table 1: Impact of Need-Based Grant on Student Outcomes

	No Grant	Grant	Full Sample
Panel A: Dependent Variables			
GPA	2.14	2.19	2.15 (1.07)
Credits Attempted	16.05	16.27	16.11 (3.88)
Graduate On-Time	0.36	0.41	0.38 (0.48)
Graduate in 5 yrs	0.64	0.69	0.66 (0.47)
Panel B: Control Variables			
Male	0.28	0.26	0.28 (0.45)
Starting Age	19.52	19.52	19.52 (2.58)
Faculty: Social Sciences	0.31	0.30	0.31 (0.46)
Faculty: ST and Med Sci	0.52	0.50	0.51 (0.50)
Faculty: Humanities and Law	0.17	0.20	0.18 (0.38)
Daily Per-Capita HH Income (USD)	8.94	2.56	7.34 (11.50)
Admission Score	41.19	41.28	41.21 (13.30)
Number of HS Exams	8.02	7.98	8.10 (1.46)
Welfare	0.05	0.23	0.10 (0.30)
Observations	14,505	5,190	19,695

Notes. The table presents the mean and standard deviation for all dependent and explanatory variables utilize in our empirical model. Three dummy variables are created for (i) The faculty of Social Sciences, (ii) The faculty of Science and Technology or The faculty of Medical Sciences, and (iii) The faculty of Humanities or faculty of Law. The number of high school (HS) subjects passed is used as proxy for past performance in our empirical models. In our full sample, the majority of students completed between 5 and 13 subjects in the standardized exit exams.

Table 2: Heterogeneous Impact by Gender and Academic Preparation

	Total	Gender		Past Performance		School Ranking		
		Female	Male	High Achiever	Low Achiever	Top Tercile	Middle Tercile	Bottom Tercile
GPA	0.22**	0.15**	0.45**	0.38***	0.08	0.13	0.37***	0.08
	(0.07)	(0.07)	(0.11)	(0.09)	(0.09)	(0.13)	(0.12)	(0.11)
Credits Attempted	0.38	0.51**	0.01	0.34	0.36	0.18	0.52	0.60
	(0.23)	(0.26)	(0.55)	(0.33)	(0.36)	(0.45)	(0.42)	(0.42)
Grad On Time	0.13**	0.01**	0.31**	0.17***	0.09**	0.18**	0.18***	-0.01
	(0.05)	(0.05)	(0.12)	(0.05)	(0.04)	(0.07)	(0.06)	(0.05)
Grad in 5 yrs	0.19**	0.16*	0.28	0.11	0.22**	0.07	0.44***	0.07
	(0.08)	(0.08)	(0.2)	(0.07)	(0.09)	(0.09)	(0.11)	(0.13)
Grant Share	0.25	0.26	0.23	0.25	0.25	0.19	0.27	0.28
First-Stage Effect	0.13***	0.15***	0.08*	0.11***	0.17***	0.15***	0.15***	0.19***
	(0.02)	(0.03)	(0.05)	(0.03)	(0.04)	(0.05)	(0.03)	(0.04)
F-Stat	236.87	212.29	65.45	182.25	149.47	94.50	117.02	111.53
Observations	19,695	14,317	5,378	10,204	9,491	6,714	7,166	6,065

Notes. *P < 0.1, **P < 0.05, ***P < 0.01. Heteroskedastic-robust standard errors are presented in parenthesis below each estimate. Where possible, each specification include controls for students' gender, starting age, faculty, per-capita household income, admission score, past performance, parish of residence, and academic year fixed effects. The share of students receiving the grant, the impact of the grant reform on the likelihood that students on welfare are awarded a need-based grant, and the F-statistic on the excluded instrument are shown in the lower panel of the table.

Table 3: Heterogeneous Impact by College-Level Decisions

	Age at Entry		Living Arrangement		Faculty		
	Delayed Entry (20+)	From HS to University	Commute	On Campus	Social Sciences	Science, Tech, and Medicine	Humanties and Law
GPA	0.14	0.25***	0.17**	0.33**	0.43***	0.16**	0.03
	(0.13)	(0.08)	(0.08)	(0.14)	(0.14)	(0.09)	(0.15)
Credits Attempted	0.71	0.26	0.38	0.28	0.59**	0.23	0.06
	(0.54)	(0.26)	(0.28)	(0.48)	(0.30)	(0.37)	(0.48)
Grad On Time	-0.01	0.18***	0.08**	0.24***	0.33***	0.03	0.02
	(0.06)	(0.04)	(0.04)	(0.08)	(0.08)	(0.04)	(0.09)
Grad in 5 yrs	0.22	0.20***	0.21***	0.18	0.21**	0.19**	0.26**
	(0.16)	(0.06)	(0.06)	(0.12)	(0.09)	(0.09)	(0.13)
Grant Share	0.26	0.24	0.23	0.30	0.24	0.25	0.28
First-Stage Effect	0.21***	0.12***	0.16***	0.10**	0.07*	0.20***	0.12**
	(0.05)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)
F-Stat	84.21	194.48	219.60	77.43	82.19	171.24	73.65
Observations	4,894	15,051	13,086	6,139	6,315	10,708	3,552

Notes. *P < 0.1, **P < 0.05, ***P < 0.01. Heteroskedastic-robust standard errors are presented in parenthesis below each estimate. Where possible, each specification include controls for students' gender, starting age, faculty, per-capita household income, admission score, past performance, parish of residence, and academic year fixed effects. The share of students receiving the grant, the impact of the grant reform on the likelihood that students on welfare are awarded a need-based grant, and the F-statistic on the excluded instrument are shown in the lower panel of the table.

Table 4: Heterogeneous Impact by Household-Level Economic Covariates

	Daily Per-Capita Income			Durable Goods Consumption			Multi-Dimensional Poverty Index	
	Lowest Tercile	Middle Tercile	Upper Tercile	Low Durable Consumption	Med Durable Consumption	High Durable Consumption	Most Deprived	Least Deprived
GPA	0.11	0.12	0.10	0.10*	0.22	0.06	0.19**	0.24
	(0.13)	(0.14)	(0.19)	(0.10)	(0.15)	(0.18)	(0.08)	(0.17)
Credits Attempted	0.86**	0.04	0.07	0.64*	0.39	1.18*	0.44	1.02*
	(0.41)	(0.52)	(0.58)	(0.36)	(0.52)	(0.63)	(0.42)	(0.60)
Grad On Time	0.13**	0.10	-0.11	0.15***	0.15**	0.04	0.12**	0.14
	(0.06)	(0.08)	(0.11)	(0.05)	(0.07)	(0.10)	(0.06)	(0.09)
Grad in 5 yrs	0.35**	0.47**	0.72	0.28***	0.29	-0.31	0.30***	-0.09
	(0.15)	(0.24)	(0.45)	(0.07)	(0.19)	(0.45)	(0.11)	(0.59)
Grant Share	0.57	0.14	0.05	0.30	0.27	0.11	0.37	0.12
Mean Income	1.11	4.81	16.07	5.00	6.01	11.38	4.18	10.43
Observations	6,563	6,569	6,563	7,555	5,845	6,295	9,778	9,917

Notes. *P < 0.1, **P < 0.05, ***P < 0.01. Heteroskedastic-robust standard errors are presented in parenthesis below each estimate. The table shows the effect of the grant program across three measures of economic well being: Daily Per-Capita Income, Durable Goods Consumption, and a Multi-Dimensional Poverty Index. We measure daily per-capita income by dividing total annual household income by family size and the number of days in the year. This variable is used to divide the distribution into terciles. To create a durable goods consumption index, we create six dummy variables that take the value 1 if the students' household does not own a television, air conditioner, electric/gas stove, washing machine, computer, or car. This index captures the deprivation of essential household durable goods and ranges from 0 (full ownership) to 6 (no asset ownership). Using this variable, we divide the distribution into three sub-groups by classifying those lacking 2 or fewer assets as households with high durable consumption, those deprived of 3 assets as having medium durable consumption, and those deprived of 4 or more assets as having low durable consumption. To create the multi-dimensional poverty index, we use three equally weighted dimensions based on the household's ability to generate sufficient income, householder's assets, and the physical characteristics of the students' house. Where possible, each model specification include controls for students' gender, starting age, faculty, per-capita household income, admission score, past performance, parish of residence, and academic year fixed effects. The share of students receiving the grant, the impact of the grant reform on the likelihood that students on welfare are awarded a need-based grant, and the F-statistic on the excluded instrument are shown in the lower panel of the table.

Online Appendix A: Additional Tables

**Table 5: Dynamic Effects of Grant Program Reform
on the Grant Eligibility of Welfare Recipients**

Time to Treatment	Grant Eligibility
T-6	-0.04
	(0.09)
T-5	-0.04
	(0.08)
T-4	0.01
	(0.08)
T-3	-0.03
	(0.08)
T-2	-0.05
	(0.08)
T	0.07*
	(0.04)
T+1	0.02
	(0.06)
T+2	0.26***
	(0.06)

Notes. *P < 0.1, **P < 0.05, ***P < 0.01. Heteroskedastic-robust standard errors are presented in parenthesis below each estimate. P < 0.1, **P < 0.05, ***P < 0.01. Where possible, each specification include controls for students' gender, starting age, faculty, per-capita household income, admission score, past performance, parish of residence, and academic year fixed effects. The table shows the impact of the reform on welfare students grant eligibility over time.

Table 6: Heterogeneous Grant Effect by Household Attributes

	Toilet Facilities		Water Access		Housing Material		Ownership Status	
	Inside Toilet	Private Sewage or Pit	Private Indoor Water	Outdoor or Public Water	Block and Steel	Other Materials	Own	Lease or Public Housing
GPA	0.06	0.21***	0.13	0.15	0.31**	0.01	0.30***	0.03
	(0.2)	(0.07)	(0.11)	(0.11)	(0.08)	(0.14)	(0.08)	(0.13)
Credits Attempted	0.6	0.43	0.39	0.41	0.5*	0.57	0.41*	0.15
	(0.75)	(0.26)	(0.39)	(0.39)	(0.28)	(0.53)	(0.25)	(0.56)
Grad On Time	-0.04	0.14***	-0.01	0.23***	0.15***	0.11*	0.16***	0.01
	(0.11)	(0.038)	(0.06)	(0.06)	(0.04)	(0.06)	(0.04)	(0.07)
Grad in 5 yrs	0.08	0.17***	0.11	0.24**	0.27***	0.20*	0.13**	0.31**
	(0.3)	(0.06)	(0.12)	(0.09)	(0.07)	(0.11)	(0.06)	(0.15)
Mean Income	8.96	6.20	8.28	4.71	7.61	6.06	7.41	7.13
Observations	8,267	11,345	14, 470	5,225	16,249	3,446	14,356	5,339

Notes. *P < 0.1, **P < 0.05, ***P < 0.01. Heteroskedastic-robust standard errors are presented in parenthesis below each estimate. Where possible, each specification include controls for students' gender, starting age, faculty, per-capita household income, admission score, past performance, parish of residence, and academic year fixed effects.

Online Appendix B: Multi-Dimensional Poverty Index (MPI)

Following Alkire and Foster (2011), we used student responses from the Student Loan Household Survey to create a Multidimensional Poverty Index (MPI). This measure allows us to identify students who are most deprived of various necessities, beyond just household income. Table 7 details the dimensions, indicators, and weights used in calculating the MPI. We focus on three equally weighted dimensions: earning capacity (1/3), household assets (1/3), and living conditions (1/3). Within each dimension, the indicators are equally weighted, summing to 1/3. To determine each student's MPI score, we sum the weights of the indicators on which they are deprived. The score ranges from 0 to 1, with 0 indicating no deprivation and 1 indicating deprivation on all indicators. For example, a household deprived of income and lacking an air conditioner would have a deprivation score of 0.223. The students with an MPI below the median (0.28) were classified as the least deprived group, while those with scores above the median were classified as the most deprived group

Table 7: MPI Dimensions and Indicators

Dimensions of Poverty	Indicator of Poverty	Person is deprived if living a household where ...	Weight
Earning Capacity (1/3)	Employment	No members are employed	0.167
	Income	Daily per capita income is less than $2.5	0.167
Assets (1/3)	TV	No TV is present	0.056
	Air Condition	No air condition is present	0.056
	Cooking Facility	No electric or gas stove is present	0.056
	Washing Machine	No washing machine present	0.056
	Computer	No computer is present	0.056
	Car	No car is present	0.056
Living Condition (1/3)	Block/Steel	House is not made of block/steel	0.111
	Water Access	Water is not available inside the house	0.111
	Toilet Access	Pit toilet is used	0.111