

State-Supported Financial Aid Impact on Baccalaureate Degree Completion in Texas

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October 2020

What We Studied

College affordability has been an urgent concern in the context of Texas higher education. In September 2003, the Texas Legislature passed HB 3015 (2003) to allow governing boards of public universities to set different designated tuition rates, with no upper limit. As a result, tuition at four-year colleges and universities in Texas has remarkably increased since 2003 (Flores & Shepherd, 2014; Kim & Stange, 2016). The sharp tuition increase might have adversely impacted students and their families, especially low-income students heavily relying on financial aid and loans in pursuing college education they deserve. Although students primarily utilize federal aid to reduce the cost of college education, state-level financial aid also plays a critical role in shaping college affordability to make college accessible to all students, especially low-income students. However, extant research does not offer clear evidence of how state-supported financial aid affects student outcomes in Texas. As a result, policy debates over the value of state-supported financial aid at the state capitol are missing key empirical evidence.

Many prior studies that have examined the relationship between state financial aid and student outcomes have reached a conclusion: along with federal financial aid, an additional state-supported aid can also play an important role in improving student outcomes. Earlier studies aggregated financial aid across type and level, but such an approach may be insufficient since the aggregated financial aid may ignore the variability across diverse financial aid programs (DesJardins, McCall, Ahlburg, & Moye, 2002). A better understanding of how different aid programs affect student outcomes may provide additional insightful information to improve the efficiency and effectiveness of state aid dollars. In addition, very little research has investigated the heterogeneity in financial aid effects across different type of students such as income status and race/ethnicity. Providing a better understanding of how students can react differently to financial aid in investments for their college degree may not only helps students meet their educational goals but also offers some insights into closing the higher education opportunity gaps for policymakers.

College affordability is vital to college access and success. The college affordability issue is very salient in the context of Texas higher education, particularly at four-year public institutions because of tuition increases caused by tuition deregulation since 2003. Although students primarily use federal aid to reduce the cost of college education, state-level financial aid also plays a critical role in shaping college affordability for all students, but especially low-income students. However, extant research does not offer clear evidence of how state-supported financial aid affects student outcomes in Texas, particularly for offsetting college costs.

Using longitudinal administrative data from the Texas Education Research Center and event history modeling, this study sought to answer two research questions: (1) How does state-supported financial aid, broken down by programs of financial aid, impact baccalaureate degree completion? (2) How do the effects of state-supported financial aid on baccalaureate degree completion vary across income status and race?

Results from various analyses on the analytic sample of first-time, resident students who began in Texas’ public four-year institutions in 2011-2012 bolster support the role state-supported financial aid can play in promoting students’ baccalaureate degree completion. Findings also show variation in the effects of state-supported financial aid on baccalaureate degree completion across programs and student characteristics such as income status and race. The findings suggest that it is necessary to explore effective strategies to increase student outcomes and reduce the inequality in educational opportunity across students by utilizing financial aid where in theory the chances of graduation heavily depend on financial resources to pay for college. Ultimately, the role of state-supported financial aid, coupled with other financial resources, is vital to ensure college affordability and student success in an era of rising costs of higher education in Texas.

How We Analyzed the Data

Given this context, it is important to understand what is known about the impact¹ of state financial aid on success in college. To date, very little evidence has offered about how state financial aid impact on baccalaureate degree completion within the context of Texas higher education. This study sought to answer the following two research questions.

1. How does state-supported financial aid, broken down by programs of financial aid, impact baccalaureate degree completion?
2. How do the effects of state-supported financial aid on baccalaureate degree completion vary across income status and race?

This study used longitudinal administrative data on individual students’ demographic, educational, and financial information. Through sample restriction process, a total of 91,663 first-time, first-year baccalaureate degree-seeking resident students between age 18-24 who began in Texas’ public four-year institutions in 2011-2012 were identified as the analytic sample for this study. For the long-term outcome, this study tracked those students for six years follow-up to capture students’ transitions from college enrollment to graduation with a baccalaureate degree through the students’ academic careers. Fifty-four percent of students in the analytic sample earned a bachelor’s degree within six years from college enrollment.

The dependent variable is defined as baccalaureate degree completion measured by a dichotomous variable, indicating whether a student received a baccalaureate degree by a Texas public four-year institution for an academic year. The independent variables include student demographic and socioeconomic background, academic preparation for college, college experiences, and financial aid and cost of attendance. In particular, state financial aid—which is of interest in this study—was broken down by programs of state financial aid to estimate differentiated financial aid effects on baccalaureate degree completion. Seven state financial aid variables— Texas Public Educational Grant (TPEG), Top 10% Scholarship, Toward EXcellence, Access, and Success (TEXAS) Grant, Texas College Work-Study (TCWS), College Access Loan (CAL), B-On-Time (BOT) Loan, and designated tuition set-asides²—were generated according to programs which are available to resident students attending Texas public four-year colleges and universities (see Table Appendix A1 for the detailed profile of each program in fiscal year 2017).

Given the longitudinal nature of the student graduation process and year-format measure of degree completion events, this study utilized discrete-time event history analysis to examine how state financial aid programs, broken down by programs of financial aid, impact the occurrence and timing of graduation over the life of students’ academic careers (RQ #1). In addition, three distinct models were used to predict association between state financial aid and the

¹ In this Brief, the terms “impact” and “effect” are often used to describe and represent a statistical relationship between one independent variable and a dependent variable. It should be noted that the statistical relationship does not imply causation or causal relationship.

² In 2003, the Texas Legislature required public institutions to set aside a proportion of their designated tuition revenues to fund financial aid programs while passing HB 3015 to deregulate tuition at the state’s public universities. The BOT Loan is also funded by designated tuition, but “designated tuition set-asides” required in HB 3015 and “BOT Loan” are exclusive in this Brief.

likelihood of graduation from college enrollment to last observed follow-up times such as four-year, five-year, and six-year. To control for systemic differences across institutions, this study applied institutional fixed-effects and cluster-robust variance estimation. These analytic approaches by clustering and differentiating institutional-level heterogeneity can be appropriate with a small number of institutions and avoid the omitted variable biases (e.g., different financial aid practices across institutions in attracting students).

This study also sought to examine variation in the effects of state financial aid programs across income status and race (RQ #2). Performing various subgroup analyses, this study not only tested differentiated effects of state financial aid by single category of two student characteristics—income status and race—but also estimated distinct effects by student specific group with multiple identities across income status and race. First, subgroup analyses based on Pell-recipient status as proxy for income status were utilized to estimate the separate effects of state financial aid on six-year graduation with a baccalaureate degree. Likewise, subgroup analyses on five racial subsamples were utilized to estimate distinct effects by racial subgroup. Furthermore, additional subgroup analyses by Pell-recipient status and race were performed to identify the specific and differentiated effects of state financial aid within each of 10 different subsamples based on the two student characteristics (e.g., White Pell-recipient, Black Pell-recipient, Hispanic non-Pell-recipient, Asian non-Pell-recipient, etc.).

What We Discovered

Research Question 1: The Impact of State Financial Aid

The results offer insights about the role that state-supported financial aid plays in promoting students' baccalaureate degree completion, including variation in the effects of financial aid by programs. Table 1 provides a summary of key findings on the impact of state financial aid programs on baccalaureate degree completion. The TEXAS Grant—which is the largest of the state's grant programs—was positively related to baccalaureate degree completion. An increase in the amount of Top 10% Scholarship awarded also predicted the largely increased likelihood of graduation with a bachelor's degree. Two state aid programs funded by set-asides from designated tuition (5% and 15% of the amount of designated tuition charged in excess of \$46 per semester credit hour for BOT Loan and Designated tuition set-asides, respectively) showed the positive relationships with degree completion. By contrast, TPEG—which was funded from a 15% tuition set-aside as part of a student's statutory tuition charge—did not show the relationship with baccalaureate degree completion. The results of this study suggest that TCWS and CAL, along with TPEG, did not contribute to increase (or decrease) in the likelihood of graduation after a student received federal grants, work-study, and loans.

Research Question 2: Variation in the State Aid Effects across Student Characteristics

This study also suggests that the effectiveness of aid on improving bachelor's degree attainment is not the same for non-Pell recipients and Pell-recipients. Table 2 provides a summary of key findings on subgroup analyses by Pell-recipient status. The results showed that each increased amount of Top 10% Scholarship, TEXAS Grant, CAL, and BOT Loan was associated with the increased likelihood of Pell recipients' six-year graduation with a baccalaureate degree while non-Pell recipients' baccalaureate degree completion within six years was positively associated with an increase in Top 10% Scholarship, TEXAS Grant, and BOT Loan but not the increased amount of CAL. In particular the significant relationship between CAL and degree completion for Pell recipients confirmed that having additional resources to cover college expenses could increase the chance of graduation for low-income students (Goldrick-Rab et al., 2016).

The findings also stand to illuminate variation in the effects of state financial aid programs across race. Table 3 provides a summary of key findings on subgroup analyses by race. Results from the analyses on the subsample by race indicate that some state aid programs such as TEXAS Grant and BOT Loan had positive effects on six-year graduation with a bachelor's degree across all student subgroups broken down by race. An increased amount of Top 10% Scholarship—which is the merit-based aid for high-achiever in high school—was related to the increased likelihood of baccalaureate degree completion for students of all racial groups except Other races. By contrast, the impact of Designated tuition set-asides was limited to specific racial subsamples such as Black and Hispanic students. The

findings confirmed the important role of additional funds supported by designated tuition play in increasing the chance of graduation, especially for students of color.

Table 4 presented the summary of key findings on the effects of state financial aid programs across 10 subsamples broken down by Pell-recipient and race. First, several state aid programs (e.g., Top 10% Scholarship, BOT Loan) increased the likelihood of six-year graduation for most subsamples. In other words, the aid programs appear to increase the likelihood of six-year graduation for most students regardless Pell-recipient status and race. By contrast, the impact of some state aid programs (e.g., TCWS, CAL, Designated tuition set-asides) were limited to specific subgroups, suggesting that the aid programs can be more effective on certain groups of students. Offering insights into what state financial aid programs can promote the likelihood of six-year graduation with a bachelor's degree for a specific subgroup broken down by Pell-recipient status and race, this exploratory analysis on the subsamples broken down by Pell-recipient status and race contributes to the unestablished line of research on heterogeneity in financial aid impact on degree completion.

Policy Recommendations

Overall, the results in this study show that financial support from state, along with federal and institutional aid, improves students' baccalaureate degree attainment at Texas four-year institutions. In the four-year college context, where tuition is typically more expensive, federal grant aid does not offset enough of the financial burden for students to significantly increase their participation on campus. In particular, as the cost of college has sharply increased, the purchasing power of the Pell Grant has considerably declined over time in the U.S. higher education (Goldrick-Rab, Kelchen, Harris, & Benson, 2016; Schudde, 2019). As to the significant effects of financial aid to the student population in general, the results of this study suggest that it seems possible that increasing additional aid to cover more college costs could further offset financial constraints and allow students to persist and finally complete their education. Given the findings, every possible effort from policymakers and lawmakers to provide state financial funding large enough to fill any unmet financial need for college expenses has the potential to move the dial regarding successful degree attainment of students at Texas four-year institutions.

The findings regarding differentiated financial aid effects on degree completion may arouse policy implementation and reform consideration in Texas. In an era of increasing demands and decreasing resources for higher education in Texas, all higher education leaders in Texas are being held accountable not only for providing access but also for ensuring success. Comprehensive and comparative studies across state aid programs can provide insightful information to understand not only the impact that each has but also reveal best practices and successful approaches in scholarship administration (Duffourc, 2006). Analyzing the relationships between state financial aid, broken down by programs, and degree attainment, this study suggests that the effects of additional financial support from state can vary across different types and programs of aid. Lawmakers and policymakers could use this information to implement and change financial aid policies based on the effects across state aid types and programs.

The BOT Program offered renewal loans for existing BOT loan borrowers, but it is not funding new loans any more since the Texas Legislature phased the program out in 2015. The Texas Legislature pointed out that loan program had remained underutilized: 36% of available funds were not utilized and only 5 of 136 institutions disbursed the entire allocation they set aside from their designated tuition revenues in 2011 (Shook, 2012). The results from various event history models on the full sample as well as subsamples broken down by Pell-recipient status and race shed light on the significant role of the loan program in increasing bachelor's degree completion. Specifically, the results suggest that BOT loans appear to be significantly related to increased chance of baccalaureate degree completion across all racial and income groups of students and support the argument that BOT loans can help students make more college accessible and affordable. Given the findings, institutions may need to make collective efforts to retake BOT loans while conducting a policy analysis to look at how the BOT loans can be effectively and efficiently used to help more students persist and graduate to answer for the underutilization of the BOT loans.

Suggesting that the designated tuition set-asides can help students complete their baccalaureate degree, the results also offer important implications for the prolonged debates on eliminating the tuition set-aside policy. The designated tuition set-asides—enacted by HB 3015—have continuously faced criticism from state government leaders and legislators who called the set-asides “a hidden tax” on the middle class. The results suggest the positive relationship between designated tuition set-asides and four-year graduation with a bachelor’s degree in general. Moreover, the results suggest that the designated tuition set-asides can increase Black and Hispanic students’ chance of six-year graduation while the impact of the set-asides for Black and Hispanic students seem larger for Pell recipients compared to non-Pell recipients. Given the substantial unmet needs of low-income and minority students in Texas due to the sharp rise in college tuition, states and institutions need to maintain, at the very least, the current set-aside policy enacted by HB 3015 to increase educational opportunity for students of color and low-income students by providing additional but substantial financial aid corresponding to the tuition increase.

This study identified distinct effects of state-supported financial aid on baccalaureate degree completion across different student subgroups. College attainment and other student outcomes are closely related to not only families’ ability to pay for college (Bailey & Dynarski, 2011; Goldrick-Rab et al., 2016) but also race (Chen & DesJardins, 2010). Implementing alternative strategies for addressing the financial needs of college students, especially those of minority students with limited incomes and financial assets (Long & Riley, 2007), is essential for racial and economic equality in higher education. The findings on heterogeneous effects of state financial aid across Pell-recipient status and race provide some insightful information to understand what type and program of financial aid can be effective strategies to reduce income and racial inequality in educational attainment among students at Texas public four-year institutions. Therefore, policymakers may need to be aware of the disparate impact of financial aid and rethink about differentiated targeting those who are most affected by each state aid program. Such strategies could not only reduce income and racial gaps in educational attainment but also help the state of Texas increase degree production to meet workforce demand for college-educated workers in Texas by implementing more collectively effective financial aid programs.

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Tables

Table 1: Relationships between State-Supported Financial Aid Programs and Graduation with a Baccalaureate Degree

Significance ($p < .05$)	4-Year Graduation	5-Year Graduation	6-Year Graduation
(+)	- Top 10% Scholarship - TEXAS Grant - BOT Loan - Designated tuition set-asides	- Top 10% Scholarship - TEXAS Grant - BOT Loan	- Top 10% Scholarship - TEXAS Grant - BOT Loan
(-)	-	-	-
Not Significant	- TEPG - TCWS - CAL	- TEPG - TCWS - CAL - Designated tuition set-asides	- TEPG - TCWS - CAL - Designated tuition set-asides

Note. (+) represents the impact of state aid is positive on graduation with a baccalaureate degree. (-) represents the impact of state aid is negative on graduation with a baccalaureate degree. See Table 6 for the estimates of the impact. Abbreviated terms: TPEG = Texas Public Educational Grant; TEXAS Grant = Toward EXcellence, Access, and Success Grant; TCWS = Texas College Work-Study; CAL = College Access Loan; BOT Loan = Texas B-On-Time Loan.

Table 2: Relationships between State-Supported Financial Aid Programs and 6-Year Graduation with a Baccalaureate Degree by Pell-Recipient Status

Subsample	TPEG	Top 10% Scholarship	TEXAS Grant	TCWS	CAL	BOT Loan	Designated tuition set-asides
Non-Pell Recipient		(+)	(+)			(+)	
Pell Recipient		(+)	(+)		(+)	(+)	

Note. (+) represents the impact of state aid is significant and positive on 6-year graduation with a baccalaureate degree for each subsample by Pell-recipient status. Significant main effects at $p < .05$ were reported in the table. Abbreviated terms: TPEG = Texas Public Educational Grant; TEXAS Grant = Toward EXcellence, Access, and Success Grant; TCWS = Texas College Work-Study; CAL = College Access Loan; BOT Loan = Texas B-On-Time Loan.

Table 3: Relationships between State-Supported Financial Aid Programs and 6-Year Graduation with a Baccalaureate Degree by Race

Subsample	TPEG	Top 10% Scholarship	TEXAS Grant	TCWS	CAL	BOT Loan	Designated tuition set-asides
White		(+)	(+)			(+)	
Black		(+)	(+)			(+)	(+)
Hispanic		(+)	(+)			(+)	(+)
Asian		(+)	(+)			(+)	
Other races			(+)			(+)	

Note. (+) represents the impact of state aid is significant and positive on 6-year graduation with a baccalaureate degree for each racial subsample. Significant main effects at $p < .05$ were reported in the table. Abbreviated terms: TPEG = Texas Public Educational Grant; TEXAS Grant = Toward EXcellence, Access, and Success Grant; TCWS = Texas College Work-Study; CAL = College Access Loan; BOT Loan = Texas B-On-Time Loan.

Table 4: Relationships between State-Supported Financial Aid Programs and 6-Year Graduation with a Baccalaureate Degree by Pell-Recipient Status and Race

Subsample		TPEG	Top 10% Scholarship	TEXAS Grant	TCWS	CAL	BOT Loan	Designated tuition set-asides
Pell-Recipient Status	Race							
Non-Pell Recipient	White		(+)	(+)			(+)	
	Black		(+)				(+)	
	Hispanic		(+)				(+)	
	Asian	(+)	(+)				(+)	
	Other races							
Pell Recipient	White		(+)	(+)			(+)	
	Black		(+)	(+)			(+)	(+)
	Hispanic	(+)	(+)	(+)		(+)	(+)	
	Asian		(+)	(+)			(+)	
	Other races			(+)			(+)	

Note. (+) represents the impact of state aid is significant and positive on 6-year graduation with a baccalaureate degree. Significant main effects at $p < .05$ were reported in the table. Abbreviated terms: TPEG = Texas Public Educational Grant; TEXAS Grant = Toward EXcellence, Access, and Success Grant; TCWS = Texas College Work-Study; CAL = College Access Loan; BOT Loan = Texas B-On-Time Loan.

Appendix

Table A1: Seven Texas State Financial Aid Programs in Fiscal Year 2017

Program	Key Eligibility Requirements	Total Amount Awarded (\$)	Recipients (N)	Avg. Award Amount (\$)	Aid Type
Texas Public Educational Grant (TPEG)	<ul style="list-style-type: none"> • Demonstrate financial need; any requirements determined by institutions 	176,135,596	133,156	1,318	Need-based grant
Top 10 % Scholarship	<ul style="list-style-type: none"> • Top 10% of high school class • Enroll full time 	7,207,826	3,631	5,115	Merit-based grant
Toward EXcellence, Access, and Success (TEXAS) Grant	<ul style="list-style-type: none"> • Demonstrate financial need • Enroll at least three-quarter time 	357,662,758	72,144	4,949	Need-based grant
Texas College Work-Study (TCWS)	<ul style="list-style-type: none"> • Demonstrate financial need • Enroll at least half time 	9,016,128	4,102	2,197	Work-study
College Access Loan (CAL)	<ul style="list-style-type: none"> • Receive favorable credit evaluation or that of a cosigner • Enroll at least half time 	166,215,488	11,429	14,454	Loan
Texas B-On-Time (BOT) Loan	<ul style="list-style-type: none"> • Enroll full time in a baccalaureate degree program 	28,844,731	3,866	13,902	Loan
Designated tuition set-asides	<ul style="list-style-type: none"> • Demonstrate financial need; institution determines type of aid and additional requirement 	252,029,316	107,943	2,332	Need-based grant

Note. Data from “Report on Student Financial Aid in Texas Higher Education: Fiscal Year 2017,” by the Texas Higher Education Coordinating Board (2018)

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