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Optimal Subsidies for Increasing Two-Year and Four-Year College Graduation Rates

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Executive Summary

This study determined the optimal tuition subsidy necessary to increase two- and four-year college graduation rates in Texas. The study also estimated the per pupil and total cost of potential subsidies and compared how they might affect college graduation rates. The goal of this exercise was to provide guidance on how the state could achieve the Texas Higher Education Coordinating Board's (THECB) 60×30TX strategic plan, an effort aimed at ensuring 60% of Texans ages 25 to 34 complete a postsecondary credential by 2030.

Background

In 2015, the THECB launched the 60×30TX strategic plan as a part of its implementation of House Bill 22, which was introduced by the 85th Texas House of Representatives to enhance public school accountability. One goal of 60×30TX is to increase the college graduation rate of Texans ages 25 to 34 to 60% by the year 2030. The target is ambitious, especially since, according to the state, only one-fifth of students who started eighth grade in the fall of 1998 completed a postsecondary credential within six years of high school graduation.

To make higher education more affordable and potentially increase college graduation rates, many states and major cities have embraced policies that heavily subsidize postsecondary education. One popular policy is to make community college free. State efforts to do so started in 2014 with the Ten-

KEY FINDINGS

A policy promising tuition-free community college would cost $136 million ($2,114 per student) but increase college graduation rates by only 4 percentage points, from 22.6% to 26.6%.

A policy providing community college students with an annual $1,120 tuition subsidy and public four-year college students with an annual $560 tuition subsidy would increase college graduation rates to 30% but cost slightly more than free community college: $189 million ($2,772 per student).

To achieve the 60×30TX goal, the state would need to provide community college students with an annual $5,320 tuition subsidy and public four-year college students with an annual $3,640 tuition subsidy.

This policy would cost approximately $16,569 per student and have a total cost of $2.3 billion.

This figure exceeds the Texas Higher Education Coordinating Board's operating budget for the 2018 fiscal year, which was $807 million.

nessee Promise and the Oregon Promise.

Prior literature on the effects of tuition subsidies generally finds positive effects on enrollment. For example, Denning (2017) examined the impact of a $1,000 tuition subsidy for community college enrollment, driven by the expansion of community college taxing districts in Texas. He found that the tuition subsidy increased community college attendance by 5.1 percentage points. This increase was largely driven by students who would not have gone to college otherwise. By comparing Michigan students living in and out of community college districts, Acton (2020) found that a $1,000 reduction in two-year college costs increased enrollment by 3.5 percentage points. In contrast to these findings, however, Carruthers and Fox (2016) studied the Tennessee Promise program and found that the increase in community college enrollment was due to students substituting four-year college enrollment for the free two-year option; the policy, they discovered, did not persuade students who would not have gone to college before the Tennessee Promise program to enroll in postsecondary education.

Data and Methods

This study used data from the Texas Education Agency (TEA), THECB and the Texas Workforce Commission (TWC) that was made available at the University of Houston Education Research Center. Students who were in the eighth grade in the fall of 1998 were tracked through 2015, when they were approximately 29 years old. The sample was further restricted to male students to simplify the model, since life-cycle events like fertility might affect education decisions. TEA data provided information on the district of high school graduation, which was then used to determine distance

60%

The targeted college graduation rate of Texans ages 25 to 34 that the state is seeking to attain by the year 2030 through its 60×30TX initiative.

to the nearest in-district community college. The THECB data provided information on postsecondary enrollment, the number of postsecondary credits students were enrolled in and the year of postsecondary completion, while the TWC data provided information on work history. To determine community college costs, a dataset of publicly available records from 2003 through 2015 was created and merged to each student's local community college.

The model used to estimate the cost of free community college policies and tuition subsidies is a two-part optimization problem. The outer problem is a cost-minimization problem in which a conditional cash transfer pair gets determined, subject to the constraint of achieving a postsecondary completion rate of 60%, 50%, 40% or 30% by age 29. The inner problem is an agent's choice problem set up as a discrete choice dynamic programming model. For each guess of the subsidy pair, to be paid in the event of two-year and four-year college enrollment, the agent's choice problem is solved and used to simulate data. From the simulated choice paths, it is then determined if the constraint of the

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TABLE 1

Comparing Tuition Subsidy Programs: Cost vs. Graduation Rate

Policy	Graduation Rate	Cost Per Student	Total Cost
Baseline College Graduation Rate	**22.6%**		
Free Community College Policies			
Free Community College Only	26.6%	$2,114	$136 million
Free Community College plus $2,000 Tuition Subsidy for Four-Year Public College	29.4%	$10,594	$753 million
Tuition Subsidies to Achieve Specific Goals			
60% College Graduation Rate: Achieve 60x30TX Goal Community College: $5,320 Public Four-Year College: $3,640	60%	$16,569	$2.3 billion
50% College Graduation Rate Community College: $2,800 Public Four-Year College: $2,800	50%	$11,693	$1.34 billion
40% College Graduation Rate Community College: $3,080 Public Four-Year College: $1,400	40%	$7,231	$658 million
30% College Graduation Rate Community College: $1,120 Public Four-Year College: $560	30%	$2,772	$189 million

outer cost minimization problem (i.e., whether or not the postsecondary completion rate by age 29 achieves a given target) is satisfied. The study proceeds in this way to minimize the cost function of the outer problem and to ultimately determine the optimal subsidy pair that does so.

Findings

Table 1 summarizes the analyses. The optimal tuition subsidy pair to achieve the 60×30TX target is given by an annual conditional cash transfer of $5,320 for community college enrollment and an annual transfer of $3,640 for four-year college enrollment. This translates to an average cost per student of $16,569 and an estimated total cost of $2.3 billion. For context, THECB's operating budget for the 2018 fiscal year was a little more than $807 million.

If the target was a 50% postsecondary graduation rate, with an optimal subsidy pair of $2,800 for both community college and four-year college enrollment, the estimated total cost would be $1.34 billion, still in excess of the THECB budget. But if the target

was a 30% postsecondary graduation rate, the estimated total cost would be $189 million. In fact, the 30% target would be more cost-effective than the more popular policy of making community colleges tuition-free. A free community college policy would achieve a postsecondary graduation rate of 26.6% but carry a cost per student similar to the 30% target. If the free community college policy provided a $2,000 tuition subsidy to students continuing on to a four-year college after finishing an associate degree, the postsecondary graduation rate would nearly match the 30% target, but the estimated cost would be $753 million, about four times the $189 million cost of the 30% target.

Policy Recommendation

Free community college and tuition subsidies may be effective ways to increase college graduation rates in Texas. The approach policymakers should choose depends on the specific goal they want to achieve as well as the amount of money they are able to spend. However, it appears the 30% graduation rate target may be more cost-effective than a blanket free community college policy.

The 30% graduation rate target may be more cost-effective than a blanket free community college policy.

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