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A NATIONAL ANALYSIS OF THE IMPACT OF PERFORMANCE-BASED FUNDING ON COMPLETION OUTCOMES AMONG HISTORICALLY UNDERREPRESENTED STUDENTS

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Due to concerns about college completion rates and the rising price of higher education, a growing number of states have sought to identify ways to hold public colleges and universities accountable for their outcomes.[1] Performance-based funding (PBF) is an increasingly popular higher education policy designed to achieve that aim by tying state appropriations to institutional performance metrics, such as the number of certificate and degree completions.[2] Over the past few decades, 41 states have used a PBF formula to allocate at least a portion of their appropriations to public colleges and universities.[3]

For four-year universities, the adoption of a high-dosage PBF system has a negative impact on bachelor's degree production for underrepresented minority students after four or five years, but high-dosage PBF systems have a positive impact on the number of White students who obtained their bachelor's degree after three, four, or five years.

Despite the wide reach of PBF policies throughout the United States, prior research has shown that PBF adoption does not typically lead to improvements in the completion outcomes being incentivized.[4]

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[1] Kelchen, R. (2018). *Higher education accountability*. Baltimore, MD: Johns Hopkins University Press.

[2] Dougherty, K. J., Jones, S. M., Lahr, H., Natow, R. S., Pheatt, L., Reddy, V. (2016). *Performance funding for higher education*. Baltimore, MD: Johns Hopkins University Press.

[3] Ortagus, J. C., Kelchen, R., Rosinger, K., & Voorhees, N. (2020). Performance-based funding in American higher education: A systematic synthesis of the intended and unintended consequences. *Educational Evaluation and Policy Analysis*, *42*(4), 520-550; Rosinger, K. O., Ortagus, J. C., Kelchen, R., Cassell, A., Voorhees, N. (2020). The landscape of performance-based funding in 2020. InformEd States.

Additional work has reported that PBF policies can lead to unintended consequences, such as restricting access to higher education for historically underrepresented students.[5] At the same time, numerous researchers have identified college completion gaps between subgroups of underrepresented minority students and their peers—regardless of whether their institution is subject to a PBF system. For example, a team of researchers reported that the average college completion rate was 14.1% lower for Hispanic students and 21.9% lower for Black students relative to the average completion rate among White students.[6] Adult students have also been found to be less likely to obtain a certificate or degree when compared to their younger peers.[7]

In response to the unintended consequences of PBF and widespread disparities in completion outcomes across demographic characteristics, several states have incorporated equity metrics into their PBF systems in order to provide targeted funds for institutions that graduate more underrepresented minority students, adult students, and other historically underrepresented subgroups of students. Roughly half of the 33 states that tie appropriations to performance consider underrepresented minority student outcomes in their PBF system. For example, Ohio's PBF formula provides an added weight for completions for underrepresented minority students—defined as Black, Hispanic, or American Indian students.[8] Some PBF-adopting states also incentivize adult student completions in their PBF formula. More specifically, Illinois, Ohio, Tennessee, Montana, and other states offer bonus funding for institutions that graduate adult or "non-traditional" students defined as age 25 and older.[9]

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[4] Ortagus, J. C., Kelchen, R., Rosinger, K., & Voorhees, N. (2020). Performance-based funding in American higher education: A systematic synthesis of the intended and unintended consequences. *Educational Evaluation and Policy Analysis*, *42*(4), 520-550.

[5] Gándara, D., & Rutherford, A. (2020). Completion at the expense of access? The relationship between performance-funding policies and access to public 4-year universities. *Educational Researcher*, *49*(5), 321-334; Umbricht, M. R., Fernandez, F., Ortagus, J. C. (2017). An examination of the (un)intended consequences of performance funding in higher education. *Educational Policy,* 31(5), 643–673.

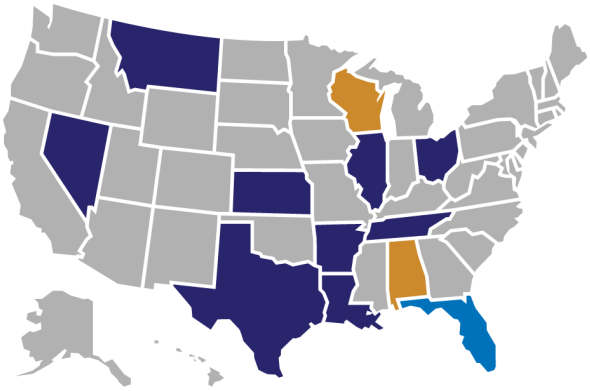
[6] Flores, S. M., Park, T. J., & Baker, D. J. (2017). The racial college completion gap: Evidence from Texas. *The Journal of Higher Education*, *88*(6), 894-921.

[7] Calcagno, J. C., Crosta, P., Bailey, T., & Jenkins, D. (2007). Does age of entrance affect community college completion probabilities? Evidence from a discrete-time hazard model. *Educational Evaluation and Policy Analysis, 29*(3), 218–235; Jacobs, J. A., & King, R. B. (2002). Age and college completion: A life-history analysis of women aged 15-44. *Sociology of Education, 75*(3), 211; Taniguchi H., & Kaufman G. (2005). Degree completion among nontraditional college students. *Social Science Quarterly, 86*(4), 912–927; Tennant, A. (2014). The effect of mathematics on the college graduation rates of adult students. *Journal of Continuing Higher Education, 62*(1), 17–28.

[8] Carey, J. (2014). State share of instruction report. Retrieved from https://www.ohiohighered.org/sites/ohiohighered.org/files/uploads/financial/ssi/SSI_Performance-Based-Funding-Evaluation-Report_Dec2014.pdf

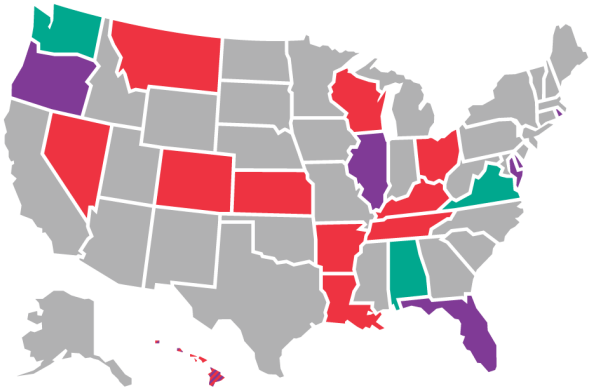
[9] Rosinger, K., Ortagus, J., Kelchen, R., Cassell, A., & Voorhees, N. (2020). The landscape of performance-based funding in 2020. *InformEd States*.

PBF States with Adult Student Metrics



- **Adult 2-year** *(FY 2019)*
- **Adult 2-year & 4-year** *(FY 2019)*
- **Adult 4-year** *(FY 2019)*

PBF States with Minority Student Metrics



- **Minority 2-year** *(FY 2019)*
- **Minority 2-year & 4-year** *(FY 2019)*
- **Minority 4-year** *(FY 2019)*

Given these dynamics, we address the following research questions:

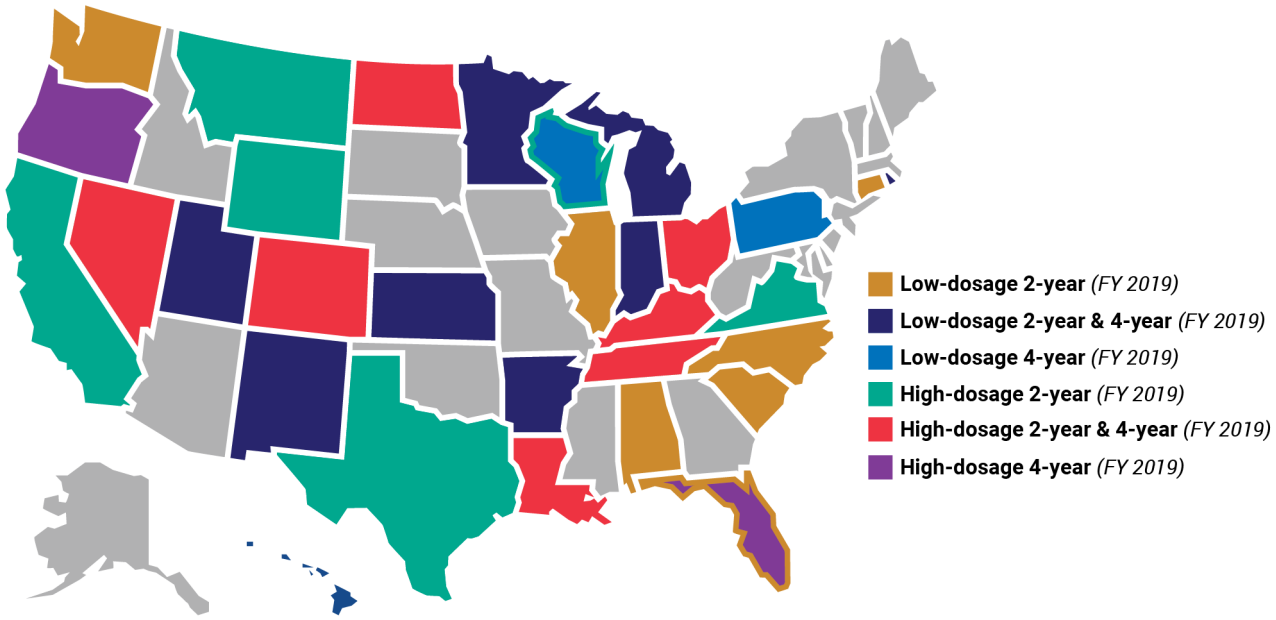
- **Research Question 1**: *To what extent do PBF policies impact the number of certificates, associate degrees, or bachelor's degrees obtained by historically underrepresented college students?*
- **Research Question 2**: *Do results vary according to the design of the PBF policy?*

To answer the above research questions, we leveraged the first comprehensive longitudinal dataset of state PBF policy details.[10] Due to distinctions in policy details (and existence) across institutional levels, we conduct separate analyses for two- and four-year institutions. The outcomes of interest for this policy brief are the logged number of certificates, associate degrees, and bachelor's degrees produced, with a particular focus on completion outcomes among historically underrepresented subgroups of students (e.g., underrepresented minority students and adult students). The treatment variables used in analyses vary across specifications. We separately examined two treatment variables that account for the relative share or "dosage" of state appropriations tied to institutional performance—a continuous measure of the percent of state funds linked to institutional performance and a categorical measure distinguishing between high-

[10] For more information on how we collected these PBF policy details, see Kelchen, R., Rosinger, K. O., & Ortagus, J. C. (2019) How to create and use state-level policy data sets in education research. *AERA Open, 5*(3), 1-14.

dosage PBF policies (greater than 10% of funds tied to performance) and low-dosage PBF policies (fewer than 10%).[11] Two additional treatment variables consider specific equity-oriented metrics included in PBF policies to incentivize completions outcomes for either underrepresented minority students (e.g., Black, Hispanic, and Native American students)[12] or adult students.[13]

Share of Funds Tied to PBF (Dosage)



For our quasi-experimental analyses designed to address the research questions outlined above, we employ a generalized difference-in-differences approach with two-way fixed effects that allow for treatment adoption across different years in different states. Our empirical models include varying lag periods[14] and controls for individual state characteristics, such as unemployment and demographic characteristics, as well as measures of institutional size, enrollment characteristics, pricing, instructional expenditures, and other financial

[11] The comparison group for institutions subject to either high- or low-dosage PBF policies includes only institutions not subject to PBF.

[12] We focus specifically on Black, Hispanic, and Native American students because these specific subgroups are typically included in PBF policies when seeking to close completion gaps in degree completion by race/ethnicity.

[13] Because adult student completion data via IPEDS have only been available since 2012, we define treatment in these subgroup analyses to PBF policies that implemented adult student completion incentives in 2014 or later.

[14] In addition to no-lag specifications, the sub-baccalaureate outcomes of certificate production and associate degree production include lags of one and two years, while the outcome of bachelor's degree production includes lags of one, two, three, four, and five years.

resources that could confound the ways in which institutions respond to PBF systems and foster degree completion. Additionally, we clustered standard errors at the institution level and implemented a variety of robustness checks in alignment with recent developments in the methodological literature pertaining to time-varying adoption of a state-level policy.

For four-year universities, the adoption of a high-dosage PBF system has a negative impact on bachelor's degree production for underrepresented minority students after four or five years, but high-dosage PBF systems have a positive impact on the number of White students who obtained their bachelor's degree after three, four, or five years. This same pattern holds when we use a continuous measure of percent PBF as the treatment variable rather than the categorical variable capturing low- or high-dosage PBF policies. When we account for specific equity metrics designed to improve underrepresented student completion at four-year institutions, we found that PBF systems with incentives for adult student completion did not have an impact on bachelor's degree production among adult students. Similarly, the adoption of a PBF system with targeted incentives for underrepresented minority student completion had no effect on the number of bachelor's degree awarded to underrepresented minority students.

For community colleges, the impact of PBF adoption appears to be more complex due to the provision of multiple sub-baccalaureate credentials—certificates and associate degrees. Although low-dosage PBF systems often have a negative impact on certificate production across subgroups of students (except adult students) and time periods, the adoption of high-dosage PBF systems has a positive impact on the number of certificates awarded to adult students during the first year of implementation but no effect on certificate production for other subgroups and time periods. When focusing on the outcome of associate degrees, we typically found that low-dosage PBF systems have a negative impact on the number of associate degrees awarded across subgroups and time periods; however, high-dosage PBF systems have no effect on the associate degree production of underrepresented minority students, either a null or positive effect on White students (depending on the time period), and a positive effect on adult students. These general patterns align with the additional specifications showing a null or slightly positive impact of PBF on certificate or associate degree production when using a continuous measure of percent PBF as the treatment variable.

We also found that PBF systems with incentives for adult student completion or underrepresented minority student completion had no effect on the number of certificates awarded to adult students or underrepresented minority students. Those same equity premiums—PBF systems with incentives for adult student completion or underrepresented minority student completion—had divergent effects when considering associate degree production. Specifically, targeted PBF incentives for adult student completion had a positive impact on the number of associate degrees awarded to adult students across all time periods,

while the PBF incentives for minority students had no effect on associate degree production for underrepresented minority students.

PBF policies have garnered considerable support from state policymakers and influential advocacy organizations despite a lack of evidence that such policies improve college completion outcomes. Given that PBF policies appear to be a firmly entrenched feature of higher education finance, the conversation surrounding PBF must shift from whether PBF systems will persist to *how* to design and implement more effective, evidence-based PBF policies. In this brief, we consider the wide variation in the design and dosage of PBF policies to examine the impact of various types of PBF policies on the college completion outcomes of historically underrepresented students. Future research can further explore the ways in which the relative share of state funds tied to institutional performance and the specific metrics, including equity incentives, highlighted in PBF formulas can either mitigate or exacerbate the intended and unintended consequences of PBF adoption.

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