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The Revenue Implications of Community Colleges' Reliance on Local Funding

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In this study, we leverage national data sources to examine the relationship between community colleges' level of reliance on local funding and their total institutional revenue, focusing specifically on community colleges educating the largest shares of low-income and racially minoritized students. We show that local funding is positively related to total institutional revenue for the pooled sample including all public community colleges, suggesting that local appropriations can supplement state appropriations in ways that benefit a historically underfunded sector of higher education. However, we also show that community colleges' level of reliance on local funding is negatively related to their total institutional revenue for rural community colleges and community colleges serving an above-average share of low-income students. Our findings align with scholarship in K–12 finance, indicating that local appropriations, such as property taxes, may exacerbate inequities facing the institutions serving larger shares of economically disadvantaged students.

Keywords: *community colleges, local funding, equity, educational policy*

Introduction

Community colleges play a critical role in nationwide efforts to reduce attainment gaps in American higher education. As open-access institutions, community colleges educate a disproportionate share of low-income, racially minoritized, academically underprepared, and location-constrained students (Bailey et al., 2015). As such, community colleges serve as engines of opportunity for millions of historically underserved students while remaining extremely responsive to the workforce demands of their local economies (Cohen et al., 2013).

Community colleges are asked to serve this pivotal role in spite of receiving lower levels of government appropriations and having fewer external funding opportunities relative to 4-year institutions (Romano & Palmer, 2016). Prior work has shown that total state and local appropriations

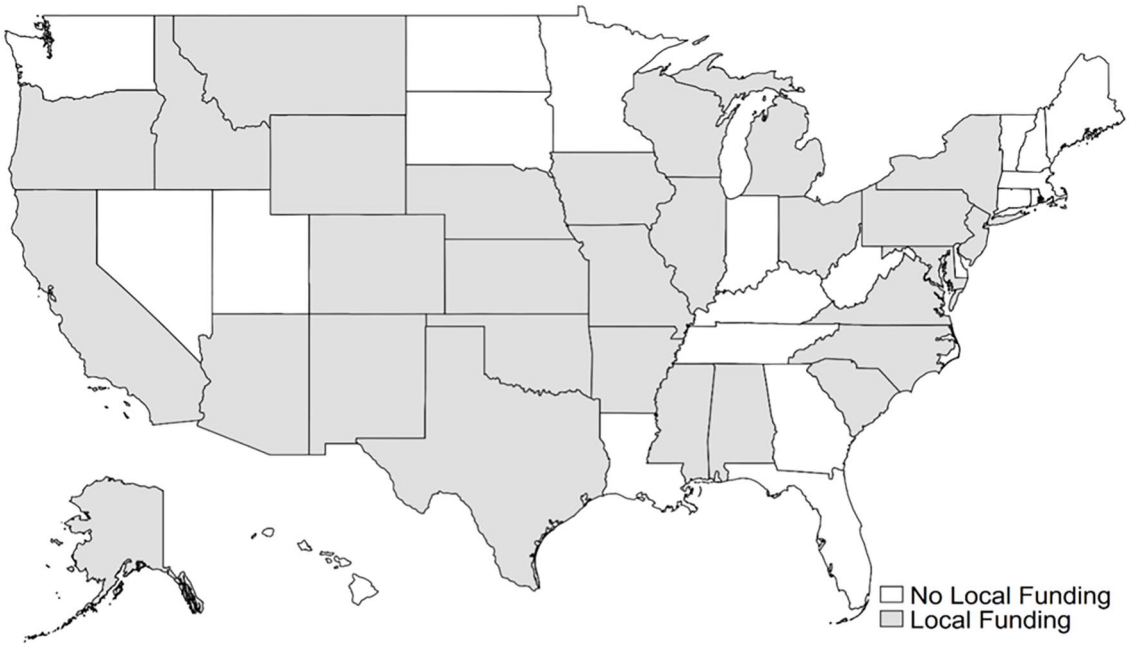

FIGURE 1. *Number of states with local funding for community colleges in FY 2018.*

allocated to community colleges decreased by 9.1% between 2003 and 2013 (Feldman & Romano, 2019), and modest increases in appropriations since 2013 have not allowed community colleges to fully recover from the Great Recession (Kolbe & Baker, 2019; Rosinger et al., 2022). According to a recent policy report by the Center for American Progress, 4-year institutions receive about $8,800 more in education revenue per student when compared to community colleges—this equates to a $78 billion difference in education revenue between the two sectors (Yuen, 2020).

Local funding has the potential to close (or widen) the considerable revenue gap between community colleges and 4-year institutions, but the financial challenges of community colleges are often described as a monolith in ways that do not consider the implications of various funding approaches or account for the complexity and differences across types of community colleges (Cohen et al., 2013). As one example, local funding can be used to supplement or supplant state funding for community colleges. This dynamic helps to explain why community colleges with local funding vary more in the amount of institutional revenue they receive when compared to community colleges without local funding (Dowd & Grant, 2006). Although local funding can represent a major revenue source for community colleges seeking to meet students' educational and workforce needs (Rush-Marlowe, 2021), the extent to which community colleges rely upon (or receive) local funding varies considerably across localities, states, and institution types.

For community colleges, only state appropriations (29%) and net tuition revenue (29%) comprise a larger share of their total institutional revenue than local appropriations (20%) (Dowd et al., 2020). Tuition revenue represents a critical funding source for community colleges, but decreases in enrollment in recent years have led to further financial complications for community colleges relative to 4-year institutions. Community college enrollment has fallen by 25% since 2011, compared to a 4% decline at public universities (authors' calculations using National Student Clearinghouse data from Spring 2023). This trend has placed stress on institutional budgets and magnified the importance of government appropriations for community colleges.

Despite the substantial role and influence of local appropriations in the overall community college funding landscape, many states do not have a single community college that receives local funding. This context is due in part to the historical development of community colleges. Early community colleges were focused on the local educational context (and even described as the 5th and 6th year of high school) until the creation of California's Master Plan. This plan served as a blueprint for the state-level coordination of a community college system and fostered a shift in the extent to which community colleges rely on local funding sources (Wattenbarger, 1966; Witt et al., 1994). In Fiscal Year (FY) 2018, local appropriations were allocated to at least one community college in 29 states (see Figure 1).

Minority-Serving Institutions (MSIs) and rural-serving institutions are particularly susceptible to financial shortfalls due to historic underfunding (Cunningham et al., 2014;

Harris, 2021; Orphan, 2020). Similar to 4-year institutions, community colleges can be designated as MSIs, classified as rural institutions, and serve varying proportions of low-income or racially minoritized students. Previous research has identified community colleges classified as MSIs, for example, as critically important sites for students to achieve upward economic mobility, evidenced by the considerable number of students at MSIs across the country who move into higher socioeconomic classes after graduating (Espinosa et al., 2018). Rural community colleges are also recognized in prior work as supportive of location-constrained students with limited access to educational options, workforce training opportunities, community spaces, food pantries, and counseling services (Rush-Marlowe, 2021). Due to the economically vulnerable communities they serve, community colleges classified as MSIs or rural-serving institutions are unlikely to make up these economic shortfalls through alternative sources of revenue, such as contracts or donative resources.

Because local funding has the potential to exacerbate already-existing inequities by using local taxes as a mechanism to provide more funding to community colleges in affluent areas and less funding to those in underprivileged areas, there are equity implications for rural, low-income, and racially minoritized students enrolled at the community colleges receiving the least amount of public funding. At the K–12 level, roughly two-thirds of state funding formulas recognize that students with greater needs are more expensive to educate and require greater resources (Kahlenberg, 2015). For higher education, a greater number of states now incorporate equity-oriented metrics into their funding formulas (Kelchen et al., 2024), but nearly all levels of higher education funding remain unequal across institution types.

The purpose of the present study is to leverage national data sources to examine the relationship between community colleges' level of reliance on local funding and their total institutional revenue. To do so, we address the following research questions:

Research Question 1: What is the relationship between community colleges' level of reliance on local funding and their total institutional revenue?

Research Question 2: Do results vary among community colleges serving disproportionate shares of rural, low-income, or racially minoritized students?

In this study, we show that community colleges' level of reliance on local funding, which is defined as the proportion of institutional revenue from local funding sources, is positively associated with total institutional revenue for the pooled sample including all public community colleges. The positive relationship between community colleges' level of reliance on local funding and total institutional revenue holds for Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs) and Hispanic-Serving Institutions (HSIs), driven primarily by generous local funding allocations in the state of California. However, this pattern does not hold across all types of community colleges. We find that community colleges' level of reliance on local funding is negatively related to their total institutional revenue for rural community colleges and community colleges serving an above-average share of low-income students.

Literature Review

This section begins by discussing previous studies that explore the broader community college funding context across states and localities. We then review prior work outlining the complications associated with relying on local funding and the broader trends pertaining to local revenue. The following section unpacks several examples across K–12 and postsecondary contexts in which the use of local funding may have exacerbated funding inequities. Previous literature has explored a variety of questions related to the equity and effectiveness of community college funding policies, but little is known about the direct relationship between community colleges' level of reliance on local funding and their total institutional revenue.

Community College Funding Context

The community college funding model varies considerably across states and localities, as numerous states allocate local appropriations to community colleges while other states do not use local appropriations to fund community colleges. Regardless of whether a given state allocates local funds, state funding represents a primary revenue source for all public community colleges throughout the United States (Laderman & Kunkle, 2021). As noted previously, state appropriations (29%) and tuition revenue (29%) comprise the highest share of total revenue sources among public community colleges (Dowd et al., 2020). Local funding (20%) remains a critical revenue source for many community colleges, but community colleges have become more reliant on revenue from tuition and fees and less reliant on revenue from local funding sources over time (Dowd et al., 2020; Ortagus & Hu, 2019; Tollefson, 2009).

The varying influence of different geographical designations further complicates the financing of community colleges. Prior literature has identified disparities in the level of funding obtained by community colleges in urban environments relative to their peer colleges located in rural areas (Rush-Marlowe, 2021). Pennington et al. (2006) elaborates on the implications of underfunding specific types of community colleges, as many rural community colleges struggle financially and lack the requisite personnel support to provide students with high-quality comprehensive services. Lower levels of state appropriations hamper the operations of rural community colleges, but their financial struggles

may be exacerbated by limited local funding options given that local funding sources, such as property taxes, are greater in other geographic areas (Koh et al., 2019).

Similar concerns surface among community colleges serving disproportionate shares of low-income and racially minoritized students, particularly MSI-eligible institutions offering subbaccalaureate credentials. Given the unique mission of MSIs and the traditionally disadvantaged students they serve, the tuition and fees of MSIs have been set to a lower level than non-MSIs in order to provide greater access and enrollment opportunities (Cunningham et al., 2014). However, this trend severely limits the revenue potential for MSIs and creates a funding environment in which community colleges designated as MSIs are more reliant on government appropriations and spend considerably less per student when compared to non-MSIs (Cunningham et al., 2014; Kelchen et al., 2020).

Local Funding: Complications and Broader Trends

Community colleges are considerably more reliant on local appropriations than 4-year institutions (Feldman & Romano, 2019; Romano & Palmer, 2016). More specifically, community colleges receive $2,016 in local revenue per full-time student, while public 4-year institutions receive only $39 in local revenue per full-time student (Yuen, 2020). Goldrick-Rab (2010) completed an exhaustive review of factors affecting community college student success and noted that community colleges' higher level of reliance on local funding may cause community colleges to be more vulnerable to financial difficulties during economic downturns. Additional research has described trends and patterns pertaining to local appropriations and community colleges' total institutional revenue, indicating relative decreases in the level of public funds allocated to community colleges (Mitchell et al., 2016; Romano, 2012). In recent work, You et al. (2022) focused specifically on financial equity among California community colleges, reporting that the gap in per-student funds received from local sources has grown from a $2,000 gap between the lowest- and highest-spending colleges in the mid-2000s to a $4,200 gap in recent years. Despite some important contributions that consider the role local funding plays in community colleges' total institutional revenue, further research is needed to directly establish a relationship between community colleges' level of reliance on local funding and institutional revenue.

Among the states that do not restrict local funding for community colleges, local funding dollars are not distributed equally across localities. The use of local funding for school financing represents a controversial topic across educational contexts, as demonstrated by the landmark Serrano v. Priest case decided by the California Supreme Court in 1971 (5 Cal.3d 584 (1971)). This decision featured a principal argument against the financing structure of the K–12 school system in California, which relied heavily on local funding, due to its violation of the California constitution's equal protection provision.

Dowd and Grant (2006) made the explicit connection between the implications of the *Serrano v. Priest* case and community college financing. Due to the considerable role and influence of local funding for community colleges, the authors argue that economically disadvantaged communities will likely have less local revenue to spend on students when compared to more affluent communities. Consequently, *Serrano v. Priest* led researchers to consider whether local funding disproportionately benefits community colleges in more resourced, wealthy geographic areas (Breneman & Nelson, 1981; Dowd & Grant, 2006). Dowd and Grant (2006) also reported that states with local funding for community colleges have revenue disparities within the state; however, the presence of local funding in addition to state funding appeared to provide a broader revenue stream that could benefit underfunded community colleges and the students they serve.

Askin (2007) examined the influence of local funding in higher education by comparing state-funded and *dual-funded* community colleges with access to both local and state funding sources. The author outlined distinguishable differences associated with community colleges that received higher levels of local funding. More specifically, community colleges receiving the highest levels of local funding also had the highest levels of funding per student. In addition, dual-funded community colleges receiving between 10% and 20% of their total funds from local appropriations had lower tuition prices than state-funded community colleges. In recent decades, community colleges have become less reliant on local appropriations and more reliant on state appropriations and tuition (Dowd et al., 2020). While earlier studies using older data have shown that community colleges with local and state funding often have more funding per student (Askin, 2007; Dowd & Grant, 2006), little is known regarding whether local funding can exacerbate revenue disparities among community colleges serving the largest shares of underserved students.

Exacerbating Inequities via Local Funding

The primary source of local funding for public K–12 education is property taxes, which have been found to exacerbate inequities between lower-income school districts and wealthier school districts (e.g., Conlin, 2014; Wong, 1994). Previous scholars have noted that a central goal of public funding in K–12 education is to account for socioeconomic differences between districts by distributing funds in a manner that accounts for the fact that some lower-income districts may not be able to pay the costs associated with the

provision of an adequate or even minimal level of educational outcomes via property taxes (Baker et al., 2021). This issue is amplified in rural school districts, which face challenges beyond limited property taxes due to a sparsity of students and the inability to achieve economies of scale. In other words, rural districts tend to have higher per-student costs due to their smaller size and similar expenses regarding physical infrastructure and maintenance that are typically unrelated to schools' number of students (Andrews et al., 2002; Levin et al., 2011).

Additional work focused specifically on higher education has described considerable gaps in funding per full-time equivalent (FTE) student between community colleges and 4-year institutions. An investigation by Kahlenberg (2015) emphasized this difference, highlighting the variance in appropriations per FTE student for selected community colleges and 4-year institutions in New Jersey. For example, total appropriations per student at Rutgers University ($12,300) are considerably higher than total appropriations per student at Essex County College ($2,400). This type of disparity reflects a national trend of underfunding community colleges, which can exacerbate inequities and be detrimental to community college students' academic outcomes, such as persistence and degree completion (Deming & Walters, 2017). Community colleges may respond to funding cuts by limiting the number and variety of course offerings, increasing class sizes, encouraging students to enroll in non-credit-accruing remedial courses, and implementing a host of other strategies.

Taken together, prior literature has identified the financial challenges facing community colleges and the complications associated with local appropriations. As referenced previously, Goldrick-Rab (2010) noted that community colleges with a greater reliance on local funding, or a higher proportion of local funding revenue relative to total revenue, may be more vulnerable to financial challenges during economic downturns. However, the relationship between community colleges' reliance on local funding and their total institutional revenue is an understudied area of scholarship, particularly among community colleges serving disproportionate shares of historically underrepresented and traditionally disadvantaged students.

Conceptual Framework

We combine the concepts of horizontal and vertical equity (e.g., Berne & Stiefel, 1984) with the social construction of policy targets (Schneider & Ingram, 1993) in order to craft a conceptual framework that explains why we might expect community colleges with a higher reliance on local funding to have significantly less overall institutional revenue, particularly institution types with historically lower levels of local tax revenue.

Funding and Equity

Similar to prior research focused on funding for K–12 schools (e.g., Baker et al., 2021; Berne & Stiefel, 1984; Garver, 2022) and community colleges (e.g., Dowd & Grant, 2006), we use the concepts of horizontal and vertical equity to guide the current study. Horizontal equity is when the amount of funding for similar types of schools or institutions is equal, frequently thought of as *equal treatment of equal schools*. Vertical equity is when the amount of funding is responsive to the needs of students such that schools or institutions with more need receive more resources, frequently thought of as *unequal treatment of unequal schools*. Berne and Stiefel (1984) detailed this relationship in K–12 school funding by combining lessons from tax policy and finance scholarship and introduced the application of both types of equity to public education funding.

These different definitions of equitable funding have direct applications to our study, which explores the relationship between reliance on local funding and overall institutional revenue for community colleges nationwide. State and local policy actors who wish to achieve funding equity must balance their interest in horizontal equity where each community college receives the same amount of funding with a desire for vertical equity where colleges that need more support to educate their students receive it. To be clear, not all states or localities seek to prioritize either version of equity. Still, we believe these concepts are useful in order to think about the inherent tensions in these differing goals of policy actors as a way to understand why we might see one state with community colleges that receive the same funding amounts and another state with significant variation.

As noted in the previous section, Dowd and Grant (2006), the prior research most germane to the current study, have shown that community colleges with both state and local funding have a higher median overall funding for institutions, measured as local and state appropriations per FTE student enrollment. In contrast, when examining the distribution of total revenues minus tuition and fees, Dowd and Grant (2006) found that institutions with local funding are similar in median total revenues minus tuition and fees per FTE to institutions without local funding. Tensions between vertical and horizontal equity could partially explain why these scholars found this divergent evidence. It could be that local funding makes the typical community college receive a larger amount of total overall appropriations but widens the gap between well-resourced community colleges and economically disadvantaged community colleges.

Still, it is unclear whether local funding of community colleges will supplement or supplant other sources of revenue, such as state funding. In other words, local funding can be used in addition to state funding in ways that lead to more public funds or as a mechanism to replace state

funding in ways that lead to less state funding and similar levels of public funds. Dowd and Grant (2006) use a single year of data from a time period of much stronger state support for higher education and exclude 15 states from their analyses. However, even if local funding does increase the overall average amount of revenues per FTE for a community college (a type of horizontal equity), that does not mean that institutions that need additional support are receiving it (vertical equity). Dowd and Grant (2006) find suggestive evidence that there is larger variation in revenues per FTE for community colleges that receive local funding. This finding suggests that community colleges with local funding vary more in the amount of revenues they receive, which could provide more opportunity for community colleges in need of more support (e.g., rural, MSIs) to be treated differently. It could be that institutions that need more support receive it, aligning with vertical equity, or it could be that already-advantaged institutions receive further financial advantages. To investigate this further, we turn to the social construction of policy targets.

Social Construction of Community Colleges

A critical component of policy adoption, implementation, and effectiveness is the target population of the policy. Schneider and Ingram's (1993) foundational work outlined how the societal perceptions of different target populations of policies influenced and shaped the policies themselves. Policies targeted toward more "deserving" populations frequently had fewer restrictions in order to gain access to the benefits or protections. In contrast, policies targeted toward populations deemed less "worthy" frequently required the navigation of substantial hurdles before benefits or protections could be provided. To exemplify this point, some states have added work requirements to the receipt of Medicaid, which offers reduced-cost healthcare for economically constrained families (Harper, 2018). Scholars have argued that part of the reason policy actors approve tying work requirements to receipt of benefits is that the recipients of this government funding are seen as personally responsible for their economic strife (e.g., Haeder et al., 2021; Nicholson-Crotty et al., 2021). Schneider and Ingram's (1993) framework has been applied to a wide variety of policies across numerous disciplines. In education, scholars have examined policy discourse on performance-based funding of higher education (e.g., Gándara, 2020; Hagood, 2019; Ortagus et al., 2023) and tuition-free promise programs (e.g., Bell, 2020; Bell et al., 2021; Everett et al., 2023). Within higher education, scholars frequently examine institutions that serve larger numbers of minoritized students or examine institutions identified as underresourced given that underresourced institutions frequently serve communities with larger shares of minoritized students.

Social constructions of target populations can help explain why vertical equity could be undermined by local funding at already-underresourced institution types. Vertical equity suggests that states would direct greater resources to institutions that serve more students from underserved backgrounds, but these populations tend to be viewed by policymakers as less "deserving" as a way to justify policy decisions that result in lower allocations of resources to these institution types. In the case of the current study, this could mean that states allow for local funding to be used at community colleges while ensuring that the less "deserving" community colleges still receive less funding by creating a funding structure in which the institutions that rely more on public funding (e.g., community colleges serving larger shares of rural, low-income, and racially minoritized students) receive lower levels of local, state, and overall resources to be allocated. Said another way, vertical equity mandates that local and/or state governments allocate more resources to institution types that serve underserved students or are underresourced, but the social construction of target populations along with the sources of funding (local communities) might undermine vertical equity for some institution types.

Framework

Based on previous literature and our conceptual framework, we would anticipate a positive relationship between community colleges' level of reliance on local funding and institutional revenue, but institutional revenues may be smaller among community colleges serving larger shares of rural, low-income, or racially minoritized students. While scholars have typically examined the presence of local funding using measures of central tendency, because of our interest in exploring vertical equity, we wish to investigate different types of institutions to see how the presence of local funding relates to certain groups of community colleges' revenue. Local funding may be a way to introduce more equitable funding structures into community colleges. Still, based on the social construction of policy targets, we would expect that community colleges with access to local funding that serve students deemed less "deserving" would have smaller institutional revenues, on average.

Data and Methods

To explore the relationship between community colleges' level of reliance on local funding and institutional revenue, we obtained data from the U.S. Department of Education's Integrated Postsecondary Data System (IPEDS) on institutional characteristics, state characteristics, and various measures of institutional revenue. The analytic sample of our study covers 2001 to 2018 and includes the population of public community colleges in the United States. More than

TABLE 1
Descriptive Statistics for Variables

Variables	All community colleges	States with local funding	States without local funding
Independent variable			
Local funding, %	13.4 (16,622)	21.1 (10,491)	0 (6,131)
Dependent variables			
Total revenue	63,000,000 (16,613)	71,500,000 (10,491)	48,400,000 (6,122)
Total revenue per FTE student	16,042.5 (16,584)	16,710.4 (10,477)	14,896.6 (6,107)
Total revenue (millions)	63.0 (16,613)	71.5 (10,491)	48.4 (6,122)
Covariates			
Tuition and fees	3,585.5 (16,519)	3,451.9 (10,445)	3,815.3 (6,074)
FTE enrollment	4,748.2 (16,621)	5,190.7 (10,490)	3,991.2 (6,131)
Instructional expenditures per FTE student	5,423.0 (16,587)	5,487.1 (10,476)	5,312.9 (6,111)
Unemployment rate, %	6.1 (16,622)	6.3 (10,491)	5.8 (6,131)
College-aged population	893,453.6 (16,622)	1,109,570 (10,491)	523,648.2 (6,131)
State income per capita	46,092.8 (16,622)	46,285.3 (10,491)	45,763.4 (6,131)
Adults with bachelor's degree, %	20.2 (16,622)	20.1 (10,491)	20.5 (6,131)
College-aged population by race			
Black students	110,540.6 (16,622)	126,431.6 (10,491)	83,348.8 (6,131)
Hispanic students	196,478 (16,622)	278,996.6 (10,491)	55,277.2 (6,131)
Native American students	5,704.4 (16,622)	7,346.4 (10,491)	2,894.7 (6,131)
Asian/Pacific Islander students	45,327.7 (16,622)	63,583.1 (10,491)	14,090.1 (6,131)

Note. Number of observations in parentheses.

100 community colleges currently offer a small number of bachelor's degree programs alongside their primary focus of subbaccalaureate credentials, including certificates and associate degrees (Floyd & Skolnik, 2019; Ortagus & Hu, 2020; Ortagus et al., 2020). To avoid classifying those community colleges as 4-year institutions, we classified institutions in our analytic sample as community colleges based on their 2018 Carnegie classification rather than their highest degree awarded. The Carnegie classification is a framework for categorizing colleges and universities based on the highest degree awarded for the majority of degree programs.

We also created indicators for different types of community colleges, including rural community colleges, community colleges serving an above- or below-average share of low-income students, community colleges serving an above- or below-average share of racially minoritized students, Predominantly Black Institutions (PBIs), Native American-Serving Nontribal Institutions (NASNIs), HSIs, and AANAPISIs. Our final analytic sample includes 977 public community colleges.

Variables

The primary outcome variables of interest for this study are total institutional revenue, logged total institutional revenue, total institutional revenue per full-time equivalent student, logged total institutional revenue per full-time equivalent student, institutional revenue in millions, and logged institutional revenue in millions. Our primary independent variable is community colleges' level of reliance on local funding, which is measured by examining the proportion of institutional revenue retained from local funding sources. In IPEDS, local funding sources include appropriations made by a governmental entity below the state level, such as local property taxes, sales taxes, and gambling taxes. Covariates included in regression models include tuition (logged), full-time equivalent enrollment (logged), instructional expenditures per full-time equivalent student (logged), unemployment rate, college-aged population (logged), state income per capita (logged), percentage of adults with a bachelor's degree or higher, and share of college-aged population by race.

We adjusted all financial variables for inflation using the Consumer Price Index and ran separate models for the pooled sample of public community colleges in addition to subgroup analyses for rural community colleges, community colleges serving an above- or below-average share of low-income students, community colleges serving an above- or below-average share of racially minoritized students, PBIs, NASNIs, HSIs, and AANAPISIs. Table 1 provides descriptive statistics for all variables included in regression models, including one column for the pooled sample of public community colleges, one column for community colleges subject to local funding, and another column for community colleges not subject to local funding. Table 2 displays descriptive statistics for the outcomes and independent variable of interest across institution types.

TABLE 2
Descriptive Statistics Across Institution Type

Variables	All CCs	AANAPSIs	HSIs	PBIs	Rural CCs	Above average (LI students)	Below average (LI students)	Above average (URM students)	Below average (URM students)
Independent variable									
Local funding	13.4 (16,622)	21.7 (1,506)	23.2 (2,667)	8.0 (867)	12.6 (3,553)	10.7 (8,227)	16.0 (8,395)	15.4 (6,934)	11.9 (9,688)
Outcomes									
Total revenue	62,970,000 (16,613)	119,400,000 (1,506)	98,960,000 (2,667)	54,500,000 (867)	37,300,000 (3,553)	56,700,000 (8,218)	69,090,000 (8,395)	78,100,000 (6,934)	52,100,000 (9,679)
Total revenue per FTE	16,042.46 (16,584)	14,127.71 (1,505)	14,974.90 (2,664)	14,444.73 (867)	15,803.16 (3,553)	15,221.91 (8,208)	16,846.55 (8,376)	16,724.77 (6,927)	15,553.03 (9,657)
Total revenue in millions	63.0 (16,613)	119.4 (1,506)	99.0 (2,667)	54.5 (867)	37.3 (3,553)	56.7 (8,218)	69.1 (8,395)	78.1 (6,934)	52.1 (9,679)

Note. Number of observations in parentheses. CC = community colleges, LI = low-income, URM = underrepresented minority.

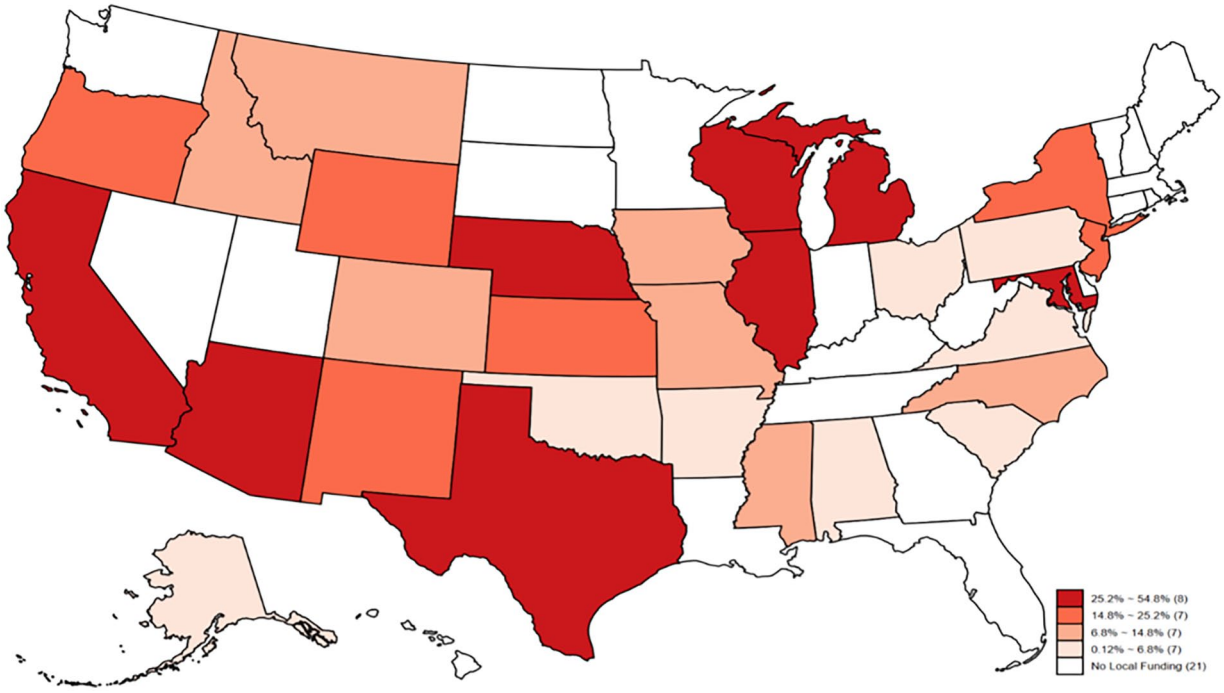

FIGURE 2. *Average percentage of institutional revenue from local funding in FY 2018.*

Figure 2 highlights the variation of our independent variable of interest by displaying the average percentage of institutional revenue from local funding across states in FY 2018. Although 29 states included at least one community college that received local appropriations during FY 2018, community colleges within some local funding states—such as California, Arizona, Illinois, Michigan, Texas, Nebraska, and Wisconsin—relied more on local appropriations than community colleges in other local funding states.

Analytic Strategy

To examine the relationship between changes in community colleges' level of reliance on local funding and total institutional revenue, we use a two-way (institution and year) fixed effects regression approach. This analytic strategy allows researchers to account for time-invariant variables not included in the regression models, such as national policy changes and economic shocks, and eliminates cross-sectional

variation between institutions. Each of our fixed effects regression models estimate robust standard errors clustered at the institution level to relax assumptions pertaining to heteroskedasticity and serial correlation within institutions.

According to Allison (2009), any fixed effects regression approach should meet two basic data requirements. First, the outcome variable should be measured for each individual community college on multiple occasions and the definition must remain the same across those occasions. Second, the independent variable of interest should change across occasions for a majority of the sample. Results derived from a fixed effects regression approach can only be interpreted as measuring variance over time *within* community colleges given that any cross-sectional variation between community colleges was eliminated by the fixed effects estimator. Formally, the fixed effects regression model is represented by the following equation:

$$y_{it} = \alpha_i + \gamma_t + \beta\, LOCAL_{it} + \mathbf{Z}_{it} + \varepsilon_{it},$$

where y_{it} represents the outcome variables described above at institution i in year t. α_i is the time-invariant institution-level fixed effect, and γ_t represents the year fixed effect. LOCAL is an indicator of a community college's level of reliance on local funding for institution i in year t. $\mathbf{Z}_{it}$ is a vector of institution- and time-varying covariates included in regression models. ε_{it} is the institution-varying, time-varying error component.

We ran a series of fixed effects regression models to estimate the relationship between changes in community colleges' level of reliance on local funding and total institutional revenue for the pooled sample and numerous community college institution types, including those classified as rural community colleges, serving a below- or above-average share of racially minoritized students, serving a below- or above-average share of low-income students, PBIs, NASNIs, HSIs, and AANAPISIs. Our first specification for all regression models is a naïve model including only the primary independent variable (level of reliance on local funding) and two-way fixed effects. Our second specification for all regression models includes the primary independent variable (level of reliance on local funding), two-way fixed effects, and the covariates described in the previous section.

Limitations

This study is subject to multiple limitations. First, we measure low-income student enrollment by using the number of federal grant recipients enrolled at a public community college due to IPEDS data limitations. The vast majority of federal grant recipients received the Pell Grant, which targets lower-income students and represents the largest federal grant aid program for college students. However, not every federal grant recipient is a low-income student, as the count of federal grant recipients includes individuals who received smaller federal education assistance programs and training funds. Despite this limitation, federal grant receipt remains the most appropriate and consistent measure of low-income student enrollment during our study period given that the number of federal grant recipients and the number of Pell recipients are correlated at .99 (authors' calculations using IPEDS data). In addition, a high share of Pell-eligible students at community colleges do not file the FAFSA (Free Application for Federal Student Aid) (Davidson, 2015) and are thus excluded from the measure.

Second, due to data limitations, we operationalize indicators for different types of MSIs by focusing solely on MSI-eligible community colleges. In doing so, we approximate MSI-eligibility status by following enrollment threshold requirements outlined by the U.S. Department of Education, but a given community college may be eligible to request designation as an MSI without actually applying for MSI status or receiving corresponding federal funds. Finally, individual states, such as California, allocate local funding in ways that may not align with the ways in which other states allocate local funding. Our analyses estimate the broad relationship between community colleges' level of reliance on local funding and total institutional revenue, but IPEDS data do not allow researchers to conduct state-by-state analyses to account for variations in funding formulas and policy designs.

Results

In this section, we provide the results from our regression models specifying the relationship between a community college's level of reliance on local funding and various measures of institutional revenue. Table 3 includes the pooled sample of public community colleges, rural community colleges, and community colleges serving a below- or above-average share of racially minoritized or low-income students, respectively. In our analyses, we found a positive relationship between community colleges' level of reliance on local funding and various measures of total institutional revenue; however, these findings did not hold for all types of community colleges.

In the pooled sample including all public community colleges in the United States, a community college's level of reliance on local funding was positively associated with total institutional revenue. When a community college's level of reliance on local funding increased by 10 percentage points, its total institutional revenue increased between 2.5% and 3.6%. For rural community colleges, their level of reliance on local funding was negatively related to total institutional revenue. Specifically, rural community colleges experienced a decrease between 3.8% and 5.4% in total institutional revenue when their level of reliance on local funding increased by 10 percentage points.

TABLE 3
Relationship Between Local Funding and Institutional Revenue

Independent variable	Total revenue		Total revenue (ln)		Per-student revenue		Per-student revenue (ln)		Revenue in millions		Revenue in millions (ln)	
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
All community colleges												
Local funding	49,753.577	86,493.164	0.002	0.003*	258.736	–186.228	0.004**	0.003*	0.050	0.086	0.002	0.003*
	(76,641.959)	(74,010.964)	(0.001)	(0.001)	(222.245)	(199.700)	(0.001)	(0.001)	(0.077)	(0.074)	(0.001)	(0.001)
n	16,609	16,483	16,609	16,483	16,580	16,483	16,580	16,483	16,609	16,483	16,609	16,483
Rural community colleges												
Local funding	–246,107.554**	–192,276.519**	–0.005**	–0.004*	–78.597*	–131.521**	–0.002	–0.004*	–0.246**	–0.192**	–0.005**	–0.004*
	(82,023.723)	(66,574.991)	(0.002)	(0.001)	(36.524)	(49.702)	(0.002)	(0.001)	(0.082)	(0.067)	(0.002)	(0.001)
n	3,534	3,529	3,534	3,529	3,534	3,529	3,534	3,529	3,534	3,529	3,534	3,529
Community colleges with above-average share of low-income students												
Local funding	–219,478.630*	–176,079.967*	–0.004**	–0.002*	–40.183	–111.363**	–0.000	–0.002*	–0.219*	–0.176*	–0.004**	–0.002*
	(101,159.337)	(82,534.109)	(0.001)	(0.001)	(29.567)	(40.928)	(0.001)	(0.001)	(0.101)	(0.083)	(0.001)	(0.001)
n	8,173	8,124	8,173	8,124	8,163	8,124	8,163	8,124	8,173	8,124	8,173	8,124
Community colleges with below-average share of low-income students												
Local funding	122,785.621	142,613.697	0.004**	0.005**	77.800*	–14.210	0.006***	0.005**	0.123	0.143	0.004**	0.005**
	(98,866.696)	(96,889.234)	(0.002)	(0.002)	(31.464)	(71.811)	(0.002)	(0.002)	(0.099)	(0.097)	(0.002)	(0.002)
n	8,342	8,262	8,342	8,262	8,322	8,262	8,322	8,262	8,342	8,262	8,342	8,262
Community colleges with above-average share of racially minoritized students												
Local funding	183,229.474	181,850.611	0.005*	0.005**	467.508	–48.625	0.005**	0.005**	0.183	0.182	0.005*	0.005**
	(122,503.215)	(117,328.653)	(0.002)	(0.002)	(402.172)	(398.714)	(0.002)	(0.002)	(0.122)	(0.117)	(0.002)	(0.002)
n	6,815	6,792	6,815	6,792	6,809	6,792	6,809	6,792	6,815	6,792	6,815	6,792
Community colleges with below-average share of racially minoritized students												
Local funding	–161,906.385*	–97,710.772	–0.002	–0.001	6.167	–128.978	0.002	–0.001	–0.162*	–0.098	–0.002	–0.001
	(75,814.340)	(88,070.723)	(0.002)	(0.001)	(23.756)	(70.120)	(0.002)	(0.001)	(0.076)	(0.088)	(0.002)	(0.001)
n	9,659	9,558	9,659	9,558	9,636	9,558	9,636	9,558	9,659	9,558	9,659	9,558
Two-way FE	×	×	×	×	×	×	×	×	×	×	×	×
Covariates		×		×		×		×		×		×

Note. RSE in parentheses, *n* = number of observations, FE = fixed effects, ln = logged.
*$p < .05$, **$p < .01$.

For community colleges serving an above-average share of low-income students, we found a negative relationship between institutions' level of reliance on local funding and their total revenue. Community colleges serving an above-average share of low-income students showed a decrease between 2.5% and 3.7% in total institutional revenue when their level of reliance on local funding increased by 10 percentage points. In contrast, a community college's level of reliance on local funding was positively related to total institutional revenue for community colleges serving a below-average share of low-income students. We found limited evidence of a positive relationship between institutions' level of reliance on local funding and total institutional revenue for those community colleges serving an above-average share of racially minoritized students, indicating an increase between 4.8% and 5% in total institutional revenue when their level of reliance on local funding increased by 10 percentage points. Importantly, findings for community colleges serving an above-average share of racially minoritized students appear to be driven by AANAPISIs and HSIs.

Table 4 includes the community colleges classified as different types of MSIs, including PBIs, NASNIs, HSIs, and AANAPISIs. The relationship between a community college's level of reliance on local funding and total institutional revenue appears to be more complicated when examining different types of MSIs. We typically found no relationship between a community college's level of reliance on local funding and total institutional revenue for community colleges eligible to be PBIs or NASNIs, with some sporadic evidence of a negative relationship between community colleges' level of reliance on local funding and institutional revenue among PBI- and NASNI-eligible community colleges. However, we found a positive relationship between the level of reliance on local funding and total institutional revenue among community colleges eligible to be HSIs or AANAPISIs. Specifically, AANAPISI-eligible community colleges experience an increase between 10% and 10.8% in total institutional revenue when their level of reliance on local funding increases by 10 percentage points. Community colleges designated as HSIs show an increase between 5% and 5.7% in total institutional revenue when their level of reliance on local funding increases by 10 percentage points.

Because HSIs and AANAPISIs are overrepresented in California, which allocates substantially more local appropriations to community colleges than the average U.S. state (State Higher Education Finance, 2021), we ran alternative specifications for HSIs and AANAPISIs to examine whether California was driving the positive relationship between local funding and institutional revenue among HSIs or AANAPISIs. After doing so, we found no relationship between local funding and total institutional revenue for community colleges eligible to be HSIs or AANAPISIs when we excluded California from the national sample (see Table A1 in the online version of the journal).

Discussion

Community colleges are designed to meet the educational needs and workforce demands of their local communities, but local funding is not available to community colleges in numerous states (Cohen et al., 2013). Among states where local funding is provided for community colleges, the amount of local funds allocated to each community college often varies considerably across localities and institution types. Despite this variation, local funding represents a critical revenue source for many public community colleges in the United States. Only state appropriations and tuition comprise a larger share of the average community college's total institutional revenue (Dowd et al., 2020). Community colleges have been underfunded for decades (Romano & Palmer, 2016), yet little is known regarding whether local funding mitigates or exacerbates the unequal funding outcomes facing various types of community colleges.

In this study, we leverage national data sources to examine the relationship between community colleges' level of reliance on local funding and their total institutional revenue, focusing specifically on community colleges educating the largest shares of low-income and racially minoritized students. We show that local funding is positively related to total institutional revenue for the pooled sample including all public community colleges, suggesting that local appropriations can supplement state appropriations in ways that benefit a historically underfunded sector of higher education. The positive relationship between community colleges' level of reliance and total institutional revenue holds for AANAPISIs and HSIs, driven primarily by generous public funding allocations in California. However, we also show that community colleges' level of reliance on local funding is negatively related to their total institutional revenue for rural community colleges and community colleges serving an above-average share of low-income students. These particular findings align with scholarship in K–12 finance, indicating that local appropriations, such as property taxes, may exacerbate inequities facing the institutions serving larger shares of economically disadvantaged students (e.g., Baker et al., 2021; Berne & Stiefel, 1984; Wong, 1994).

In conceptualizing the relationship between community colleges' level of reliance on local funding and overall institutional resources, we drew on the concepts of horizontal equity, where each community colleges receives the same amount of funding and vertical equity where colleges that need more support to educate their students receive additional funds. Local funding offers an opportunity for state

TABLE 4
Relationship Between Local Funding and Institutional Revenue

Independent variable	Total revenue		Total revenue (ln)		Per-student revenue		Per-student revenue (ln)		Revenue in millions		Revenue in millions (ln)	
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs)												
Local funding	201,027.273	219,953.800	0.010***	0.010***	153.556**	142.602**	0.011***	0.010***	0.201	0.220	0.010***	0.010***
	(152,803.738)	(170,044.456)	(0.002)	(0.002)	(55.973)	(52.623)	(0.002)	(0.002)	(0.153)	(0.170)	(0.002)	(0.002)
n	1,497	1,490	1,497	1,490	1,496	1,490	1,496	1,490	1,497	1,490	1,497	1,490
Hispanic-Serving Institutions (HSIs)												
Local funding	190,306.196	240,402.422	0.005*	0.006**	90.355	98.770	0.005*	0.006**	0.190	0.240	0.005*	0.006**
	(140,772.768)	(137,686.855)	(0.002)	(0.002)	(54.004)	(60.538)	(0.002)	(0.002)	(0.141)	(0.138)	(0.002)	(0.002)
n	2,648	2,637	2,648	2,637	2,645	2,637	2,645	2,637	2,648	2,637	2,648	2,637
Native American-Serving, Nontribal Institutions (NASNIs)												
Local funding	–356,989.060*	–334,286.489*	–0.013	–0.011	125.335	–185.025	0.009	–0.011	–0.357*	–0.334*	–0.013	–0.011
	(133,659.930)	(154,839.678)	(0.008)	(0.008)	(163.729)	(135.305)	(0.012)	(0.008)	(0.134)	(0.155)	(0.008)	(0.008)
n	300	298	300	298	300	298	300	298	300	298	300	298
Predominantly Black Institutions (PBIs)												
Local funding	–126,506.063	20,799.017	0.002	0.005	97.746*	71.476	0.007*	0.005	–0.127	0.021	0.002	0.005
	(374,408.534)	(339,739.002)	(0.004)	(0.003)	(41.101)	(45.573)	(0.003)	(0.003)	(0.374)	(0.340)	(0.004)	(0.003)
n	861	859	861	859	861	859	861	859	861	859	861	859
Two-way FE	×	×	×	×	×	×	×	×	×	×	×	×
Covariates		×		×		×		×		×		×

Note. RSE in parentheses, *n* = number of observations, FE = fixed effects, ln = logged.
*$p < .05$, **$p < .01$, ***$p < .001$.

and local policymakers to increase horizontal equity by expanding funding opportunities for community colleges. However, local funding also reflects a tension with vertical equity, as community colleges' level of reliance on local funding may serve to increase resources for already-advantaged institutions relative to underresourced institution types. Our findings appear to confirm this tension: Community colleges' level of reliance on local funding may lead to greater institutional resources, on average (thus increasing horizontal equity), but leads to greater funding disparities for rural community colleges and community colleges serving an above-average share of low-income students (thus decreasing horizontal equity). The social construction of policy targets (Schneider & Ingram, 1993), in which policy design and implementation leads to more favorable outcomes for populations deemed more "deserving" of public funds, also helps to explain why community colleges that serve larger shares of less-advantaged students would have smaller revenues, on average, following an increased reliance on local funding.

Our findings are in alignment with the contextual factors outlined in scholarship focused on the relationship between local funding and K–12 education. The *Serrano v. Priest* ruling and the subsequent spate of court-ordered and legislatively enacted reforms focused on leveraging state funds to ensure more equitable and adequate levels of funding for K–12 schools, given disparities that emerged from schools' reliance on local funding (see Jackson et al., 2016). Our findings also align with research on funding for public colleges and universities, which shows differences in state (and often local) funding per FTE student for community colleges relative to 4-year institutions (e.g., Rosinger et al., 2022).

Additional work reports lower funding levels for less-advantaged institution types, such as MSIs and rural or regionally focused institutions (Cunningham et al., 2014; Harris, 2021; Orphan, 2020). The present study adds additional context to this research by showing the extent to which local funding shapes overall institutional resources and disparities in funding across institution types. Our results advance prior work suggesting that local funding may lead to revenue disparities in the community college sector (Dowd & Grant, 2006) and further illuminates how local funding can undermine vertical equity in community colleges, leading to lower levels of institutional resources for rural community colleges and community colleges educating the largest shares of low-income students.

Implications for Policy, Practice, and Future Research

This study offers several implications for state and local policymakers when it comes to designing more equitable higher education funding models. First, we show that community colleges' reliance on local funding can expand institutional resources overall, indicating that local communities can play an important role in financing a higher education sector that is closely linked to workforce needs, economic development, and upward mobility. However, policymakers at the state and local levels should be wary of how community colleges' increased reliance on local funding can exacerbate funding inequities across institution types. Similar to K–12 education, additional states may consider equalizing funding levels across institution types (leading to greater horizontal equity in the community college sector) or explicitly directing state funds in the pursuit of vertical equity. A larger emphasis on state-level strategies to allocate greater funds to community colleges that serve the most underserved students may help to balance the inequitable funding structure currently hampering rural community colleges and community colleges serving larger shares of low-income students.

Given the importance of local funding for community colleges in many states, subsequent research might consider the impact of local funding policy design when exploring the equity and effectiveness of different types of local funding sources (e.g., property taxes, sales taxes, gambling revenues). IPEDS data enable researchers to examine the amount of local appropriations received by an individual community college, but IPEDS data do not allow researchers to distinguish between different types of local appropriations. This particular data limitation represents a critical problem for policymakers seeking to better understand how to close revenue gaps facing rural community colleges and community colleges serving an above-average share of low-income students. Although this study advances what we know about the role and influence of local funding in higher education, future researchers should collect and analyze more nuanced data pertaining to the specific sources and uses of local appropriations allocated to community colleges due to differences in local funding policy design across localities and states. This will allow researchers to better understand the extent to which the impact of local funding varies across states with funding formulas that use local funding to offset, rather than supplement, state funding obligations.

K–12 literature has revealed that property taxes, in particular, can exacerbate inequities (Baker et al., 2021; Berne & Stiefel, 1984; Wong, 1994), but other types of local taxes, such as sales taxes or gambling taxes, may be able to close the funding gap facing public community colleges in a more equitable way. Simply put, policymakers are unable to make evidence-based decisions regarding the most equitable and effective ways to fund community colleges if they do not know how community colleges are funded. Future research can leverage institution-level data on specific types of local funding mechanisms to allow policymakers to gain a clearer understanding of how localities fund community colleges and whether specific types of local revenue sources serve to mitigate or exacerbate funding inequities facing different types of community colleges.

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