SHEEO
State Higher Education Executive Officers Association

ALL POLITICS IS LOCAL: INTRODUCING A RELATIVE MEASURE OF HOW ADEQUATELY STATES FUND COMMUNITY COLLEGES BASED ON COUNTY-LEVEL DEMOGRAPHICS

July 2025

FRANK FERNANDEZ
XIAODAN HU

The authors thank Denisa Gandara, Kelsey Kunkle, and Dustin Weeden for helpful comments and feedback. The authors also thank the Joyce Foundation and the State Higher Education Executive Officers Association (SHEEO) for financial support.

All Politics is Local: Introducing a Relative Measure of How Adequately States Fund Community Colleges based on County-Level Demographics

Twenty-two times, state courts have ruled that legislatures are inadequately funding K-12 schools based on constitutional rights to public education (Feng et al., 2019). When states implemented court-ordered financing reforms, the poorest school districts increased per-student spending by 11.5% to 12.1%. Those districts then showed increased graduation rates by between 6.8% and 11.5% (Candelaria & Shores, 2019). The notion of funding adequacy should be extended beyond public high schools and into community colleges to ensure students have consistent and adequate resources to equal learning opportunities in higher education. Community colleges enroll disproportionate shares of the nation's underrepresented racial minority students (American Association of Community Colleges [AACC], 2024). These students have often been poorly served by underfunded schools and school districts (Sosina & Weathers, 2019) and enter higher education with additional academic and student services needs that can be costly for colleges. Underrepresented racial minority students are also disproportionately affected when college budgets are cut (e.g., Bahr et al., 2015; Jenkins & Belfield, 2014).

We argue that states should examine how they fund community colleges based on the students those colleges serve. Prior literature has examined education funding based on county-level demographics (Coburn & Horowitz, 2003; Miller, 1996; Ladd & Murray, 2001). Figlio and Fletcher (2012) argued that stark disparities in local funding for education were correlated with local demographics, which "may also help to explain state interventions in school finance at the state level" (p. 1153). In other words, it is important to focus on state appropriations exactly because local demographics predict inadequacies in local education expenditures. Community colleges, which often aim to serve residents in local counties, are uniquely positioned to transform state investment into healthy and economically thriving communities (e.g., Van Noy et al., 2023). Prior literature has focused on K-12 school resources, but we argue it is important to focus on community college finance for two reasons: First, examining adequacy in community college funding could be used to help prevent legal allegations that states are perpetuating racialized funding disparities between community colleges. Second, state policymakers could use this approach of defining and measuring funding adequacy based on how county demographics relate to the overall state population to close inequitable funding gaps that correlate with race. Achieving funding adequacy while considering racial equity ensures that the community colleges that are best situated to address state higher education completion gaps (e.g., between Black students and white students) have more resources to do so. State completion agendas are contingent on improving college success for these groups of students, particularly in community colleges (Mullin, 2010).

Prior scholarship has sought to apply K-12 education finance concepts to consider how public higher education should be funded (Fernandez et al., 2023; Hu & Fernandez, 2024; Prescott et al., 2021; Romano & Palmer, 2023). However, scholars have not reached consensus on how to define *adequacy* or how to identify when potential inadequacy is correlated with racial demographics within a state. For this paper, we adopt Richmond and colleagues' (2024) approach of conceptualizing adequacy as a way of thinking about how to consider equity when distributing new dollars to support public education. In other words, our approach to adequacy-based funding is not to argue for transferring or redistributing allocations among community colleges within a state. Instead, we argue that states should adopt a definition of adequacy that leads them to "legislatively commit to direct future increases in state dollars toward the students and institutions with the greatest need" (Richmond et al., 2024, p. 11).

Measuring (in)adequacy is necessary for communicating to policymakers the scale and influence of funding gaps and to show the level of new resources that would need to be infused into community colleges to ameliorate disparities. Although securing new dollars for public education can be a daunting political task, it is worth noting that community colleges enjoy broader support than other sectors of higher education, and policymakers should work to devote new resources to "the people's college" (Koos, 1947, p. 138). Polling data show that 87% of Republican voters hold favorable perceptions of community colleges, compared to less than 70% for four-year colleges and universities (Cecil, 2025). This study uses publicly available, national data to measure inadequacies in state support to public community colleges relative to surrounding demographics. We examine various sources of state funding, including base appropriations, state grants and contracts, and state-funded financial aid. Whereas prior measures focus on measuring income neutrality across states (Baker et al., 2022), we introduce a new index that measures racialized disparities within states. Our work is guided by the following research question: *In what ways are differences in state funding for public community colleges related to the racial diversity of potential students?*

Based on our analyses, we introduce a novel index, which provides a measure of in-state funding adequacy that is comparable among funding sources, across states, and over time. The index identifies where states are underfunding public community colleges based on county demographics. We also show that the index predicts state-level completion outcomes (i.e., credentials awarded to students across racial groups). When states funnel resources in the form of base appropriations to community colleges in whiter counties, it negatively influences Black and Hispanic attainment. However, when states more adequately fund base appropriations to community colleges in counties with larger Black (or Hispanic) populations, multiple racial groups tend to earn higher credentials. We close by discussing how the index can be a tool for state elected officials and policymakers to set benchmarks and consider ways to adequately fund community colleges based on the demographics they serve.

Literature Review

Black and Hispanic students are often cast as underrepresented in higher education, but they are overrepresented in community colleges. In 2020-21, 40% of all Black undergraduate students and 51% of Hispanic/Latino undergraduates were enrolled in community colleges. Yet, these groups make up 13.7% and 19.5% of the U.S. population, respectively. Comparatively, only 39% of white undergraduate students enroll in community college, even though 58.4% of the U.S. population is white (Community College Research Center, n.d.; U.S. Census Bureau, 2023). Black and Hispanic students are disproportionately enrolled in community colleges for at least two reasons. First, many Black and Hispanic students choose to attend colleges where they can enroll with a high proportion of same-race peers and where they perceive that students of the same race have previously been successful (Black et al., 2020). Second, many Black and Hispanic students enroll at community colleges because they are affordable; their in-district tuition is, on average, one-third of what public four-year institutions charge in-state students (Ma & Pender, 2023). Because community college tuition and fees are low (relative to most public—and especially private—four-year universities), they bring in fewer dollars to spend on teaching and student services. That makes them heavily reliant on state funding.

Despite the fact that community colleges serve many students who are less academically prepared for college, they are inadequately funded to serve those students well (e.g., Hu & Fernandez, 2024; Romano & Palmer, 2023). For instance, Chen and Simone (2016) found that "at public 2-year institutions, 78

percent of Black students and 75 percent of Hispanic students (vs. 64 percent of white students) ... took remedial courses" (p. 18). In other words, they need further preparation before they can enroll in college-level courses that allow them to accumulate credits toward a postsecondary credential or transfer to a four-year university. Educational research suggests that colleges can improve students' odds of being successful *if* colleges can afford to provide costly wraparound support services (Miller & Weiss, 2022; Weiss et al., 2019). In other words, the challenge is not *finding* solutions to support students, but *funding* colleges to support students.

At the same time that community colleges are trying to make up for adversities elsewhere in the educational pipeline, they are also expected to be a conduit to four-year universities. Nationally, around 20% of students who enroll in four-year universities start at a community college. Some large states, like California and Florida, have even broader transfer pathways. Around 25% of four-year students in California previously enrolled at community colleges; in Florida, the share is closer to 33% (Velasco et al., 2024). Furthermore, Black and Hispanic students disproportionately rely on the transfer pathway to access four-year universities (Velasco et al., 2024). Several studies show that the transfer pathway helps community college students enroll at a more selective four-year university than they would have likely been able to attend straight out of high school (e.g., Hilmer, 1997; Ortagus & Hu, 2019). Based on their unique position as dually enrolling high school students, providing developmental education to underprepared high school students, disproportionately serving students who are marginalized by educational systems, and opening opportunities for students to attend selective four-year universities, it is time to consider whether community colleges are adequately funded to fulfill all the contradictory aims they are expected to complete (Dougherty, 1994; Kisker et al., 2023).

State Funding for Community Colleges

There is an emerging shift in the literature on higher education finance. Contrary to performance-based funding approaches that calculate appropriations based on student outcomes, scholars and policymakers are increasingly advocating for adequacy- and equity-based funding approaches (Fernandez et al., 2023; Hu & Fernandez, 2024; Prescott et al., 2021; Romano & Palmer, 2023). Performance-based funding approaches incentivize colleges and universities to focus on admitting and serving students who are already most likely to graduate (i.e., they cost less to serve) rather than serving students who need more support (e.g., McKinney & Hagedorn, 2017; Umbricht et al., 2017). Rather than doling out appropriation increases based on how colleges perform along a set of metrics, adequacy-based approaches aim to offer colleges sufficient funding to support all students, particularly those who need additional services, and to build institutional capacity to sustain these resources. Whereas performance-based funding puts accountability at the forefront, adequacy-based funding prioritizes giving colleges resources to ensure student success and then using accountability to monitor changes in institutional outcomes (e.g., Dziesinski & Hillman, 2024; Fernandez et al., 2023; Hu & Fernandez, 2024; Hillman et al., 2024; Illinois Commission on Equitable Public University Funding, 2024).

Researchers who are advancing the notion of adequacy-based funding focus on state appropriations because, although they have historically declined, they continue to account for the largest share of community college revenues. As a national average, state appropriations declined from 30.5% of total community college revenue in 2007-08 to 23.9% in 2020-21 contracts (National Center for Education Statistics [NCES], 2022). On top of base allocations, public community colleges also received 5% of their overall revenues from state grants and contracts in 2020-21 (NCES, 2022). Community colleges typically receive state funding based on factors such as institutional size, the cost of education, student

demographics, the availability and level of local appropriations, and performance metrics (McKeown-Moak, 1999; Mullin et al., 2015; Mullin & Honeyman, 2007; Rosinger et al., 2022). Because state allocations continue to be the largest revenue source for public community colleges, scholars argue that states should be responsible for making adequate and equitable financial investments to support racial minority students attending community colleges (Baker et al., 2022; Baum & Kurose, 2013; Belfield et al., 2014; Dowd & Shieh, 2014; Romano & Palmer, 2016).

States may use state grants and contracts to supplement base appropriations to chronically underfunded community colleges (e.g., Barr & McClellan, 2018). Because wealth disparities based on geographic locations and local economic factors lead to unequal capacity for local communities to fund community colleges (Kahlenberg, 2015; Kolbe & Baker, 2019; Melguizo et al., 2017), there can be substantial revenue disparities across colleges within the same state (Dowd, 2004; Dowd & Grant, 2006). For example, Illinois allocates one-time grants each year to correct the recurring underfunding problem for City Colleges of Chicago, which serves racially diverse students, but is subject to statutory limitations on how much revenue can be raised through the local tax base. Yet, scholarship has largely overlooked assessing state grants and contracts in terms of adequacy or equity. Therefore, we analyze state grants and contracts in addition to base appropriations to consider how states can use multiple funding streams to deliver substantial support to community colleges. Additionally, we argue it is important to examine state grants and contracts as a distinct funding strategy because base appropriations are typically unrestricted and can be used at administrators' discretion, but grants and contracts often come with restrictions. In this way, different funding streams may exacerbate funding inequity if whiter community college systems have a greater share of unrestricted funds, while more racially diverse colleges are relatively restricted in how they can use state funds to support students. Finally, examining different funding streams will provide different options for states to choose from when addressing funding inequities.

State Funding for Students via Financial Aid

State funding constitutes smaller and smaller shares of community college budgets. As state funding declined, community colleges increased tuition and fees. In the last three decades, the national average share of net tuition has nearly doubled from 15% of total community college revenue in 1987 to 29% of the total revenue in 2015 (Dowd et al., 2020). This trend creates escalating costs to students and families in the public two-year sector, which was historically the most affordable college option. Rather than undoing disinvestment in community colleges, states have sought to alleviate the challenge of increasing tuition and fees through various financial aid programs to students. In the realm of community colleges, state financial aid mechanisms include Promise Programs (e.g., Billings et al., 2021; Billings et al., 2023) and merit-aid programs (Hu et al., 2024). These state-funded financial aid programs play a critical role in supporting students' postsecondary access and success by influencing community college enrollment and degree attainment (Domina, 2014; Gurantz, 2019; Welch, 2014).

Broader literature suggests that community college students benefit from more generous state financial aid. As previously mentioned, community colleges enroll high percentages of low-income students. While low-income community college students generally have lower academic achievement than their non-low-income peers, financial aid helps close that achievement gap (Coria & Hoffman, 2015). State financial aid, above and beyond federal aid, positively predicts student persistence in community colleges (Mendoza et al., 2009). When students who have traditionally been excluded from state financial aid programs are given access to financial aid, they increasingly enroll in community college,

often take and complete more college credits, and can even be more likely to complete college (Ngo & Astudillo, 2019). These findings highlight the importance of states investing in financial aid as part of a broader move to advance equity and adequacy in community college finance (Dowd et al., 2020).

Equitable Funding for Racial Minority Students in Community Colleges

When community colleges are more adequately funded through different state streams (i.e., base appropriations, grants and contracts, and financial aid), they are equipped with more resources to improve student outcomes (Thompson & Riggs, 2000; Titus, 2006). For example, an additional $1,000 spent on instruction per FTE is associated with a 1.3% increase in graduation rates at community colleges (Bailey et al., 2006). Conversely, when state appropriations decrease, community colleges often reduce spending. Repeatedly, empirical evidence indicates that cost-cutting at community colleges negatively influences student success, especially for underrepresented racial minority students (Calcagno et al., 2008; Jenkins & Belfield, 2014; Johnson-Ahorlu et al., 2013). If community colleges increase tuition and fees to offset state funding cuts, students also suffer. When budget cuts are passed on to students and their families through higher costs of college, postsecondary enrollment and completion decline (Deming & Dynarski, 2010; Monarrez et al., 2021). Racial minority students are the most sensitive to price shocks that come from absorbing cuts (Heller, 1999; Leslie & Brinkman, 1987).

Different from a typical four-year student, community college students do not sort based on college quality and available resources (Stephenson et al., 2016); that is, they do not strategically seek out community colleges that have greater funding or per-student expenditures (Stange, 2012). Students tend to choose the nearest community college because their states have provided limited options for accessible public postsecondary education. Baker et al. (2023) examined California's public colleges to demonstrate that racial segregation not only exists between sectors (e.g., two-year and four-year) but also within the community college sector. Because students do not make college choices based on community college quality or resources, and because segregation persists within the public community college sector, it is important to develop a consistent, comparable measure of how well states fund community colleges that serve diverse demographics of potential students.

Theoretical Framework

We apply the "gray peril" hypothesis to consider how funding adequacy may relate to race within and across states (e.g., Berkman & Plutzer, 2004, p. 1178; Lambert et al., 2009). The gray peril hypothesis builds on public administration research which shows that public education spending decreases as state demographics change, particularly when younger cohorts (who directly benefit from public education) are more racially diverse than older cohorts who no longer enroll in public schools but continue to vote and have an interest in limiting public expenditures and tax increases (e.g., Poterba, 1997). Prior studies that use county-level demographics to examine education expenditures have cited Poterba's (1997) classic work (e.g., Colburn & Horowitz, 2003; Figlio & Fletcher, 2012; Ladd & Murray, 2001), and the hypothesis is primarily used in analyses of finance data from public primary and secondary schools (e.g., Berkman & Plutzer, 2004; Duncombe et al., 2003; Lambert et al., 2009; Plutzer & Berkman, 2005) and, to the best of our knowledge, is largely overlooked in higher education research.

We draw on the gray peril hypothesis to consider how community college funding (in)adequacy relates to race. We do not test for evidence to support the gray peril hypothesis—that is, whether demographic changes explain educational expenditures over time. Prior literature cited above has consistently provided empirical support for the gray peril hypothesis. Instead, we rely on the framework to develop a

hypothesis about the relationships between county-level racial demographics and state support for public community colleges. Specifically, we expect that community colleges will receive more adequate base appropriations when they serve counties with larger percentages of white residents. Comparatively, we expect state funding to be less generous for community colleges in counties with larger shares of Black residents. The Black population in the U.S. experienced moderate growth between 2000 and 2019 (29%), which was larger than the growth of the white population but much less than the growth of the Hispanic population (Tamir, 2021). We expect that community college funding inadequacy in terms of base appropriations will be at its worst among community colleges that serve counties with larger Hispanic populations, because the Hispanic population is one of the largest and fastest-growing racial minority groups (Funk & Hugo Lopez, 2022). The Hispanic population skews younger, and over the last couple of decades, substantially larger percentages of public school and public college students are Hispanic (Hugo Lopez et al., 2018; Santiago et al., 2024). This trend has been referred to as "The 'browning' of public schools" (Bryant et al., 2017, p. 265) and public schools becoming "suddenly diverse" (Turner, 2020, p. 9).

The gray peril hypothesis proposes one possible mechanism that prevents states from achieving "vertical equity," whereby colleges would receive more resources to serve students with greater needs (e.g., Berne & Stiefel, 1984; Dowd & Grant, 2006). As county and state demographics change, states should adjust allocations to community colleges so they can adequately serve the evolving needs of potential students, rather than assuming that all students have similar needs that demand similar support (i.e., horizontal equity). However, the politics of an aging electorate limit resources and create disincentives for state policymakers to direct resources to educational institutions that serve emerging racial minority communities. We argue that moving toward state-level funding adequacy should attend to racial equity as a priority instead of an afterthought.

Though the gray peril hypothesis does not draw distinctions between recurring, base allocations and other forms of state assistance to public education, it may explain how state funding policies use alternative funding sources as incremental and short-term remedies to address racial inequity, as opposed to more drastic and permanent changes in state funding models. Because states greatly vary in the level and distribution of grants/contracts and financial aid on top of base appropriations (e.g., Barr & McClellan, 2018), we specifically examine how funding adequacy measures may relate to race when it comes to other state funding mechanisms. In the next section, we describe the measures we used to apply the gray peril hypothesis in analyzing variations of state funding to community colleges based on racial diversity.

Methods

We compiled a panel dataset between 2003 and 2020 from three sources: Institution-level data from the Integrated Postsecondary Education Data System (IPEDS), county-level demographic data from the Census Bureau, and county-level income data from the Bureau of Economic Analysis. We first restricted our sample to 1,355 institutions that were either public two-year institutions or public four-year institutions with Carnegie classifications as baccalaureate/associate's colleges or associate's colleges in 50 states. We further excluded 13 institutions that were either post-baccalaureate credential-granting institutions or U.S. service schools. Finally, we removed observations of 15 institutions that were closed between 2003 and 2020, as well as 14 institutions with no county-level demographic information. The final dataset includes 1,313 institutions between 2003 and 2020 (n = 20,208). The list of variables is presented in Appendix A in detail, and a descriptive summary of variables in selected years is presented in Appendix B.

Operationalizing State Funding Adequacy based on County-Level Racial Demographics

First, we built a prediction model to estimate the (logged) level of public funding from state sources (i.e., appropriations, grants and contracts, and financial aid) at the college level. We used the Ordinary Least Squares approach to build a prediction model informed by higher education literature (e.g., McKeown-Moak, 1999; Mullin et al., 2015; Mullin & Honeyman, 2007; Rosinger et al., 2022). That is, we included a list of institution characteristics (i.e., institutional sector, urbanicity, logged total enrollment, percentage of federal grant recipients, percent of awarded credentials as certificates), county-level characteristics (i.e., race composition, logged per capita income), and state and year fixed effects in the regression model. We ensured model fit with a statistical test-driven approach (Hu, 2023).

$$\widehat{y_{it}} = b_1 race_{it} + b_2(state \times race_{it}) + b_3 Z_{it} + c_i + h_t$$

where $\widehat{y_{it}}$ represents the predicted dependent variable at institution *i* in year *t*. In each model specification, the race composition term ($race_{it}$) was calculated as a z-score representing the proportion of white, Black, and Hispanic at the county level, respectively. Following Baker et al. (2022) and Kolbe and Baker (2019), we further controlled for varying race composition in each state by including an interaction term between race composition and state. Z_{it} represents additional county- and institution-level covariates described above. c_i represents the time-invariant state-level fixed effect, and h_t represents the year fixed effect (Allison, 2009). The model explained 62%–70% of the variation in the dependent variable, as indicated by the R-squared value between 0.62 and 0.70.

Next, we calculate a race-based funding equity index at the state level between 2003 and 2020. Specifically, we calculated each predicted state funding outcome for each community college when the county-level race composition z-score equals 1 (i.e., the proportion of a certain race group being one standard deviation above state average) and -1 (the proportion of a certain race group being one standard deviation below state average). To calculate a state-level index per year, we first calculated the average predicted outcomes of institutions within each state (i.e., average of predicted institution-level state appropriations, state grants and contracts, and state-funded financial aid when z-score equals 1/-1) and then took the ratio of the two state-level averages:

$$Equity\ Index_{state} = \frac{\overline{\widehat{y_{it}}\ when\ race_{it} = 1}}{\overline{\widehat{y_{it}}\ when\ race_{it} = -1}}$$

According to Baker et al. (2022), this calculation approach is not influenced by sample size. A ratio greater than one suggests that community colleges in counties with a higher proportion of the population in a certain race category receive more state funding (i.e., logged state appropriations, logged state grants and contracts, logged state-funded financial aid) than colleges in counties with a lower proportion of the same demographic group. Conversely, a ratio less than one suggests that community colleges in counties with a higher proportion of the population in a certain race category receive less state funding than colleges in counties with a lower proportion of the same demographic group. When the ratio is closer to one, it indicates a small funding disparity between community colleges in counties with a higher percentage of the population from a specific demographic group and those in counties with a lower percentage of the same group. The index measure is easy to interpret among funding sources, across states, and over time. We repeated this procedure for different racial groups (i.e., white, Black, and Hispanic).

Application of the Index on State-Level Credential Completion

As an exploratory application of the index, we tested whether it predicted the (logged) number of credentials, including associate degrees and certificates of at least one academic year, awarded to white, Black, and Hispanic students, respectively, in each state. To explore the correlational relationship between state-level index and credential completion between 2003 and 2020, we calculated the total number of credentials awarded for white, Black, and Hispanic subgroups at the state level by adding the number of credentials awarded by each community college in our sample by year. The condensed state-level dataset included 900 observations (i.e., 50 states across 18 years). We used multiple linear regression to test whether the relationship between state index scores and the number of credentials awarded was statistically significant. Using a parsimonious model specification, we controlled for the number of total state enrollment (logged), state fixed effect, and year fixed effect. To test the robustness of our results, we estimated models from one-, two-, and three-year lag periods because state funding may have a delayed effect on credential completion.

Results

We used institution-level data and adapted approaches used by Kolbe and Baker (2019) and Baker et al. (2022) to create a funding equity index based on the state-level racial demographics of potential students attending community colleges. Our results indicate disparities in state funding based on racial concentration where the community college resides. We organize the findings based on each state funding category by describing the longitudinal trend and state-specific trend for each racial group, before presenting the relationship between the index and state-level credential completion for community colleges across the states between 2003 and 2020.

Funding Equity Index for State Appropriations

As presented in *Figure 1A*[1], the index for state appropriations was consistently above 1 (around 1.012) for the white group. That is, on average, a higher level of state appropriations was predicted to flow to community colleges in counties with higher percentages of white residents. The national average index was also above 1 for the Black group, but the absolute value was closer to 1, around 1.002, indicating a more "neutral" state appropriations distribution. The seemingly "neutral" index (i.e., community colleges receive similar amounts of state funding regardless of county-level demographics) indicates an absence of "vertical equity" and suggests that state funding overlooks the needs of racially diverse students in distributing state appropriations. Finally, the national average index was constantly below 1 (around 0.994) for the Hispanic group, which indicates that lower levels of state appropriations have been distributed to community colleges in counties with higher percentages of Hispanic population.

Figures 1B, 1C, and *1D* present the state-level equity index for state appropriations based on each racial group. For example, South Dakota's index value of 1.34 means that community colleges in whiter counties (i.e., a county whose proportion of the white population was one standard deviation above the state average) in South Dakota were predicted to receive 1.34 times logged state appropriations than less-white counties (i.e., a county where the proportion of the white population was one standard deviation below the state average). In the context of South Dakota, a college in a whiter county could receive over $10 million in annual state appropriations, compared with a college in a less-white county receiving $200,000 appropriations from the state. We applied the same approach to generate an index

[1] Alaska and Kentucky were excluded from the longitudinal calculation due to missing data in multiple years.

based on Black and Hispanic demographics at the county level. The results in Figure 1C and 1D indicated that on average between 2003 and 2020, over two-thirds of states were predicted to allocate equal or more state appropriations to community colleges in counties with more Black residents, but only about half of states were predicted to at least similarly support community colleges in counties with more Hispanic residents.

FIGURE 1A

THE LONGITUDINAL NATIONAL AVERAGE OF EQUITY INDEX FOR STATE APPROPRIATIONS

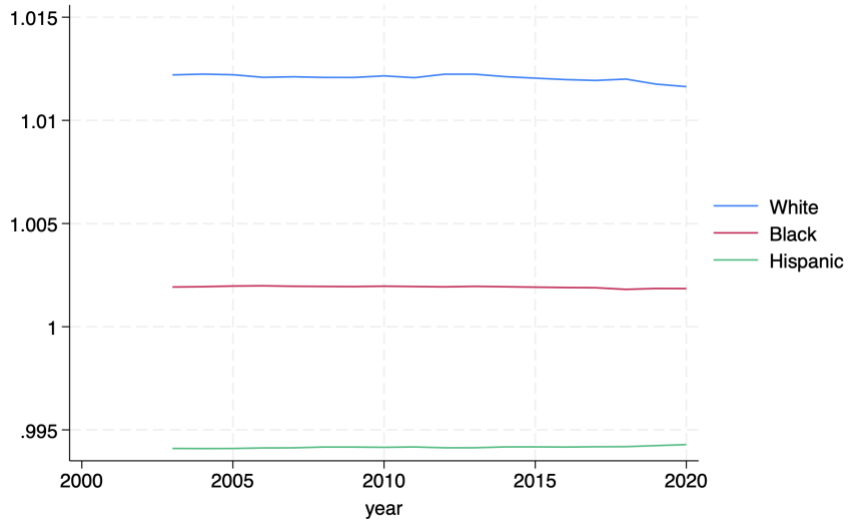


FIGURE 1B

EQUITY INDEX ON STATE APPROPRIATIONS BASED ON COUNTY-LEVEL WHITE POPULATION

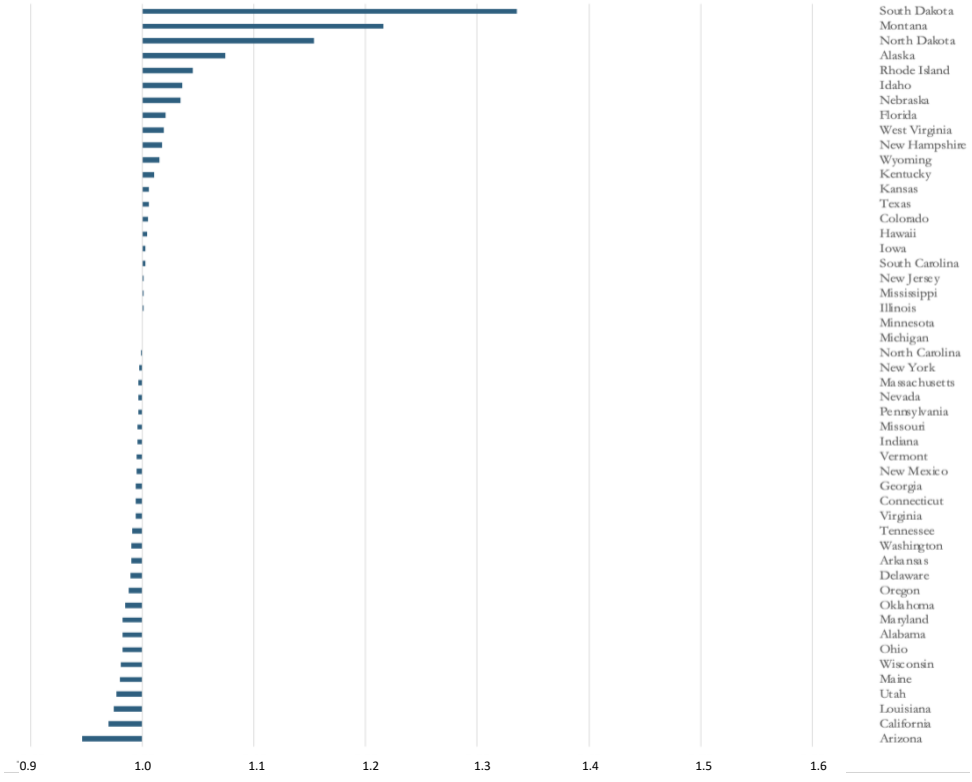


FIGURE 1C

EQUITY INDEX ON STATE APPROPRIATIONS BASED ON COUNTY-LEVEL BLACK POPULATION

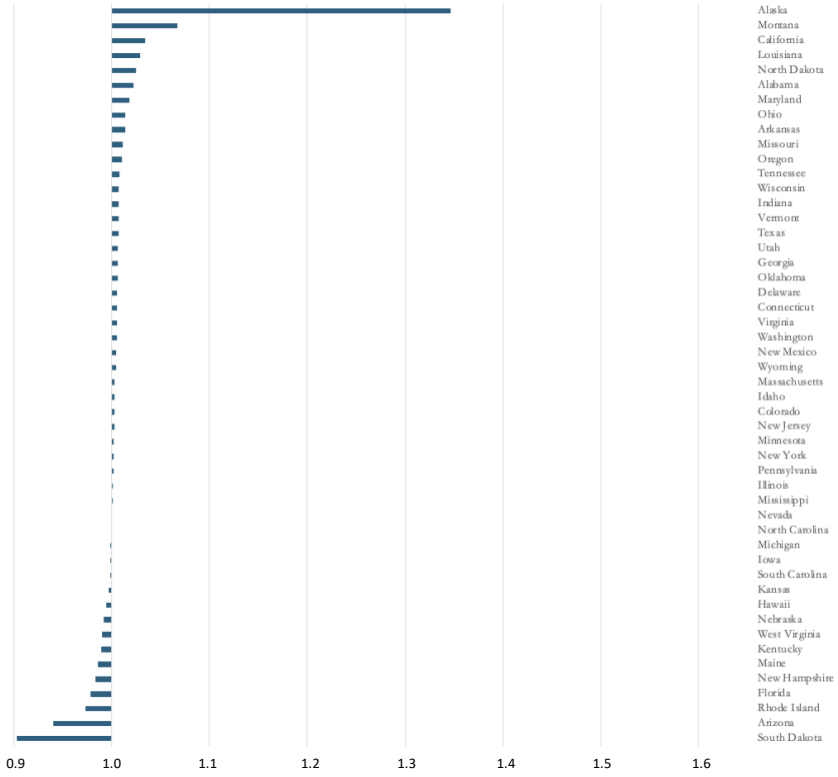
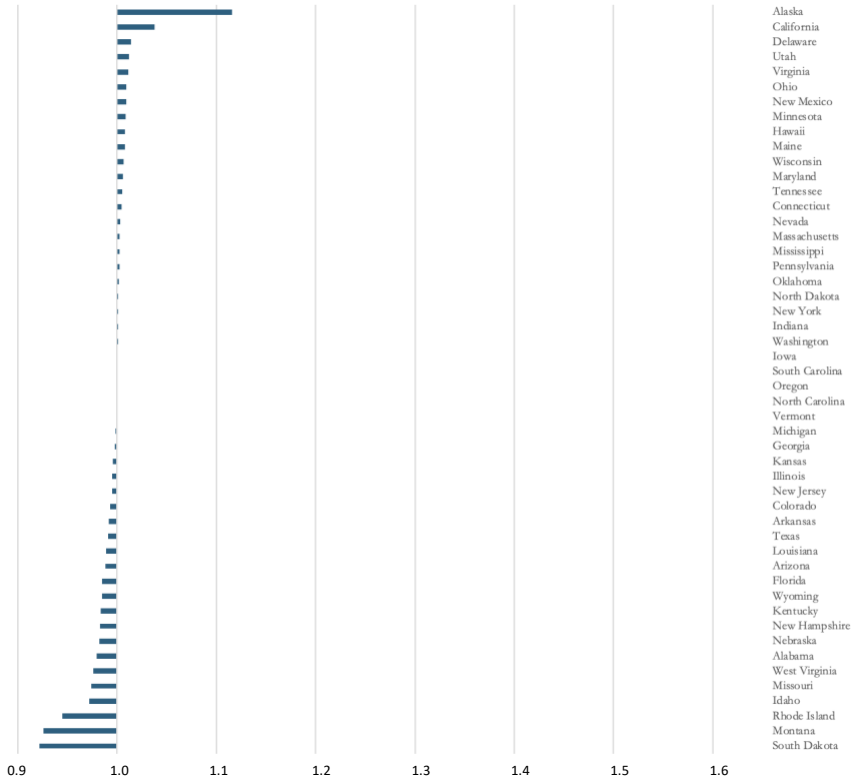


FIGURE 1D

EQUITY INDEX ON STATE APPROPRIATIONS BASED ON COUNTY-LEVEL HISPANIC POPULATION



Funding Equity Index for State Grants and Contracts

Different from the distribution pattern of state appropriations, between 2003 and 2020, the index for state grants and contracts was consistently above 1 for the Black and Hispanic measures, but below 1 for the white measure (*Figure 2A*[2]). In other words, on average, a higher level of state grants and contracts was predicted to be distributed to community colleges in counties with higher percentages of Black and Hispanic populations. While the index seems to be progressive (i.e., the average value for state grants and contracts was consistently below 1 for the white measure), the level of appropriations is usually multiple times higher than the level of funding a community college receives as additional revenue from state grants and contracts (as indicated in Appendix B). Therefore, even if state grants and contracts are used as a progressive tool to smooth out differences in base funding to community colleges in different counties, they are unlikely to fully close the gap of inadequate state appropriations.

It is worth noting that the national average is also skewed by states with extreme values (e.g., Alaska, Rhode Island) as indicated by *Figures 2B*, *2C*, and *2D*, which present the state-level equity index measures for state grants and contracts based on each racial group. The use of grants and contracts varies across states, and the predicted disparity in state grants and contracts seems to be larger than disparities in base appropriations. Take Utah for example: its index value for white residents of 1.07 means that community colleges in whiter counties were predicted to receive 107% of logged state grants and contracts than the ones in less-white counties. On the contrary, Utah's community colleges in counties with more Black and Hispanic residents were predicted to receive 97% of logged state grants

[2] Kentucky was excluded from the longitudinal calculation due to missing data in multiple years.

and contracts than community colleges in counties with fewer Black and Hispanic residents. In other words, Utah's community colleges in whiter counties (i.e., one standard deviation above the mean) were predicted to receive over $1.8 million in state grants and contracts, compared with community colleges in less-white counties (i.e., one standard deviation below the mean) receiving $650,000 state grants and contracts. On the contrary, community colleges in counties with more Black and Hispanic residents could receive $540,000 less in state grants and contracts relative to their counterparts in counties with fewer Black and Hispanic residents.

FIGURE 2A

THE LONGITUDINAL NATIONAL AVERAGE OF EQUITY INDEX FOR STATE GRANTS/CONTRACTS

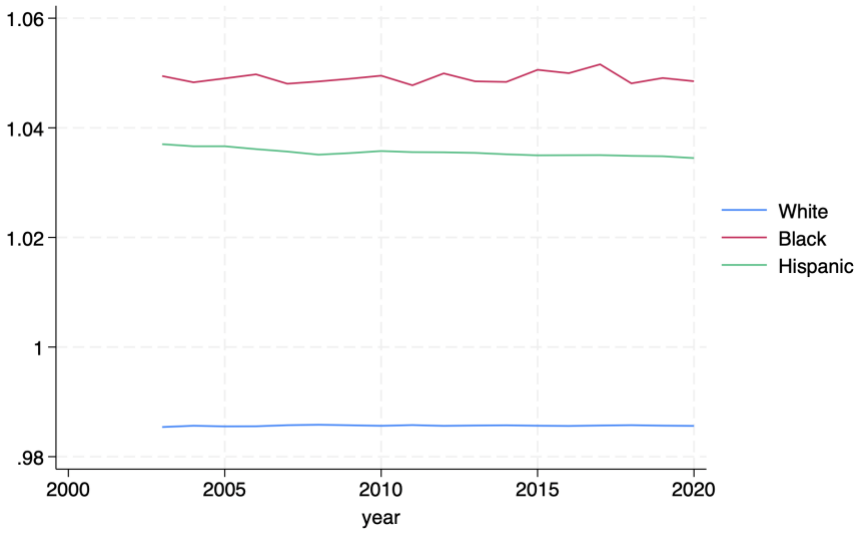


FIGURE 2B

EQUITY INDEX ON STATE GRANTS/CONTRACTS BASED ON COUNTY-LEVEL WHITE POPULATION

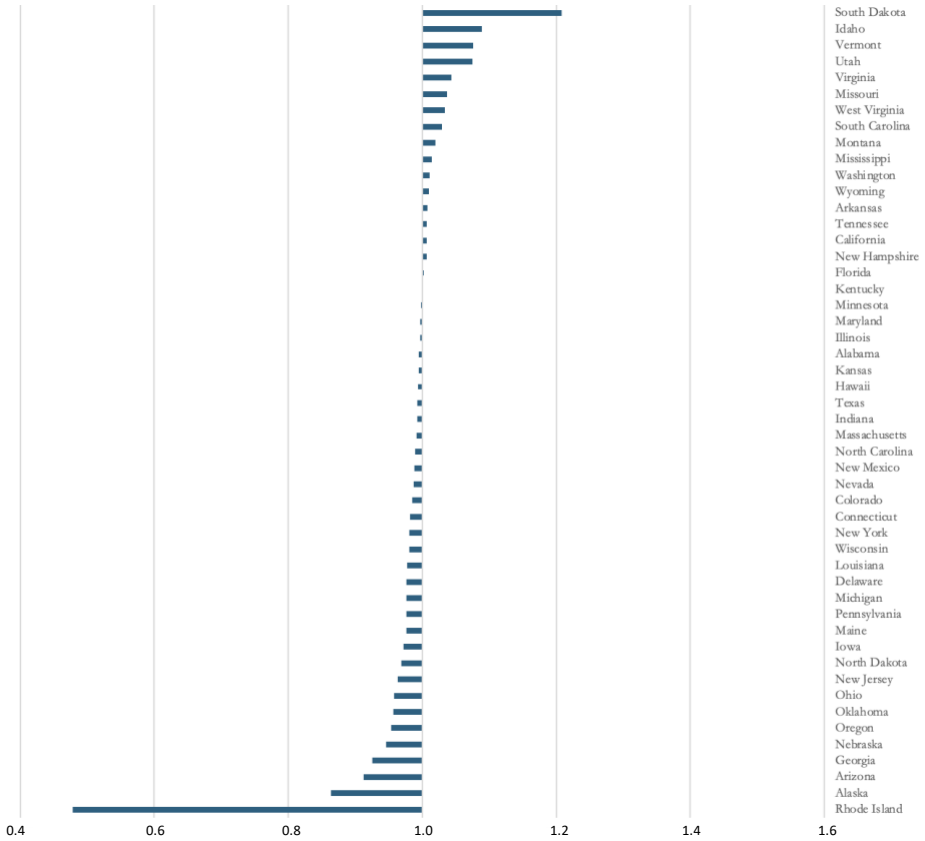


FIGURE 2C

EQUITY INDEX ON STATE GRANTS/CONTRACTS BASED ON COUNTY-LEVEL BLACK POPULATION

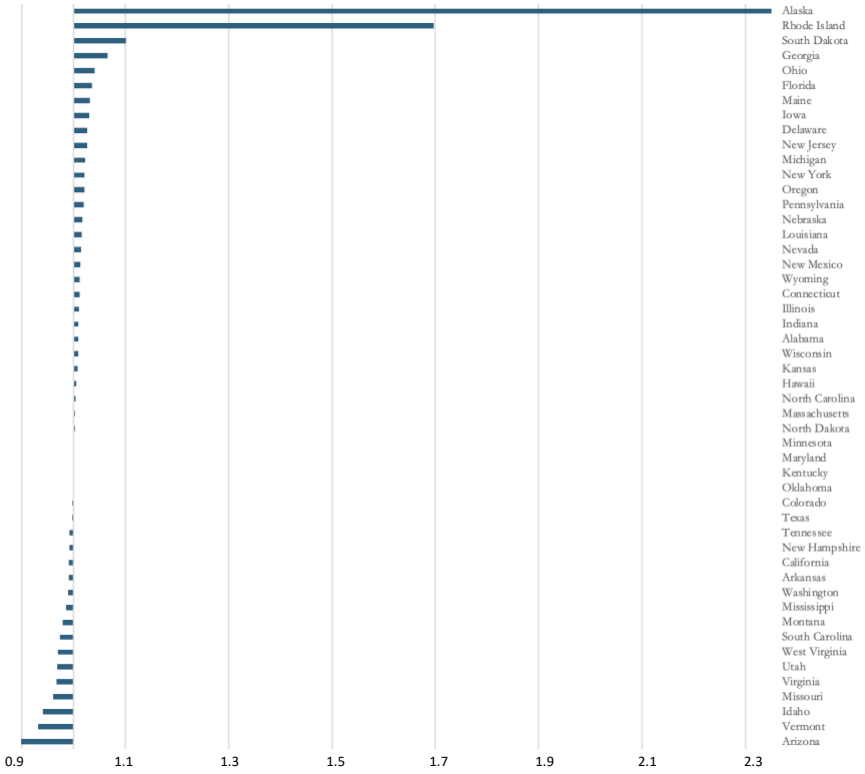
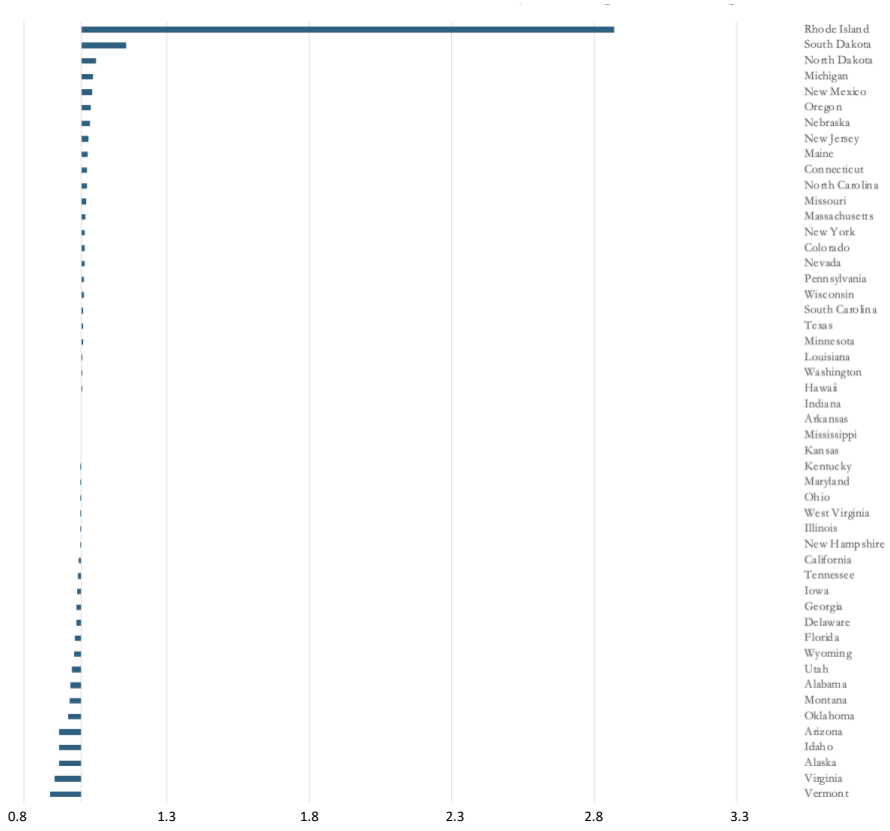


FIGURE 2D

EQUITY INDEX ON STATE GRANTS/CONTRACTS BASED ON COUNTY-LEVEL HISPANIC POPULATION



Funding Equity Index for State-Funded Financial Aid

As presented in *Figure 3A*,[3] the national average index for state-funded financial aid was consistently above 1 for public community colleges in disproportionately white and Hispanic counties but below 1 for colleges in counties with greater Black representation. Similar to funding distribution of state grants and contracts, the national index average for state funding through financial aid programs is likely influenced by outlier states (as presented in *Figures 3B*, *3C*, *3D*).

The distribution of state-funded financial aid could be determined by different types of state grants and scholarships. In Nevada, where three-quarters of undergraduate grants and scholarships were awarded through non-need-based aid in 2021-22 (National Association of State Student Grant & Aid Programs [NASSGAP], 2022), the index values predicted that community colleges in whiter counties received 1.05 times logged state-funded financial aid than community colleges in less-white counties, representing a $1.5 million difference. Conversely, Nevada's community colleges in counties with greater shares of Black and Hispanic residents were predicted to receive 97% and 91% of logged state-funded financial aid compared to public community colleges in counties with fewer Black and Hispanic residents, respectively. In other words, Nevada's community colleges in counties with more Black and Hispanic residents (i.e., one standard deviation above the mean) were predicted to receive $830,000 less and $4.8 million less in state-funded financial aid, compared with community colleges in counties with fewer Black and Hispanic residents (i.e., one standard deviation below the mean), respectively.

[3] Alaska, Hawai'i, Kentucky, New Hampshire, and Rhode Island were excluded from the longitudinal calculation due to missing data in multiple years.

In another example, Michigan awarded over three-quarters of undergraduate grants and scholarships through need-based aid in 2021-22 (NASSGAP, 2022). Michigan's index values predicted that community colleges received similar levels of state-funded financial aid regardless of their relative share of white and Black residents, although Michigan's public community colleges were predicted to receive 1.05 times the value of logged state-funded financial aid in counties with more Hispanic residents. In the context of Michigan, a community college in counties with more Hispanic residents could receive over $260,000 in state-funded financial aid, compared with the predicted value of $139,000 for community colleges in counties with fewer Hispanic residents.

FIGURE 3A

THE LONGITUDINAL NATIONAL AVERAGE OF EQUITY INDEX FOR STATE FINANCIAL AID

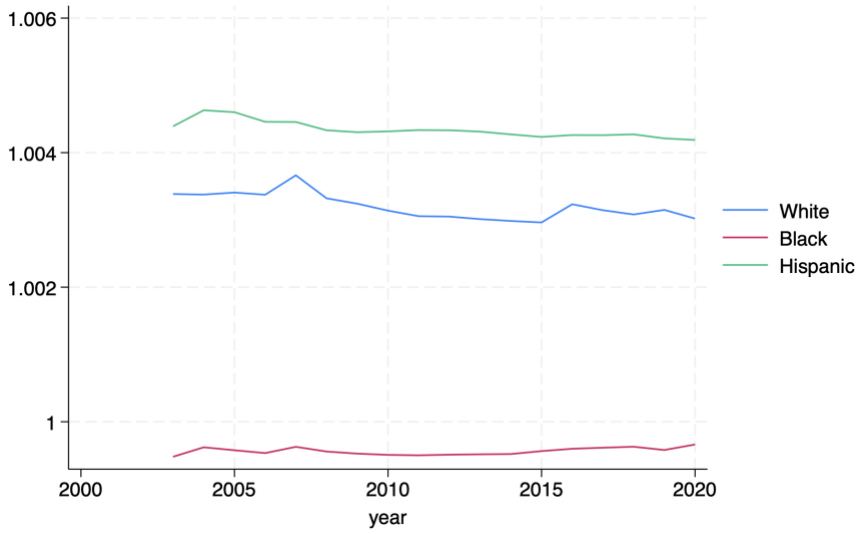


FIGURE 3B

EQUITY INDEX ON STATE FINANCIAL AID BASED ON COUNTY-LEVEL WHITE POPULATION

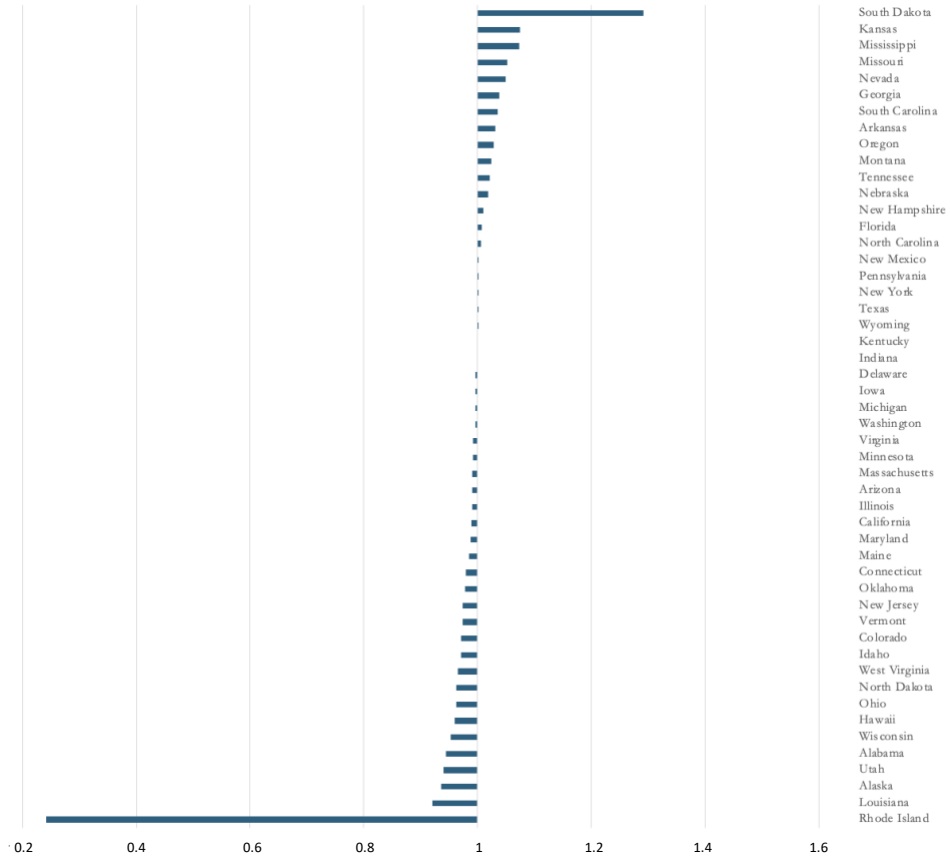


FIGURE 3C

EQUITY INDEX ON STATE FINANCIAL AID BASED ON COUNTY-LEVEL BLACK POPULATION

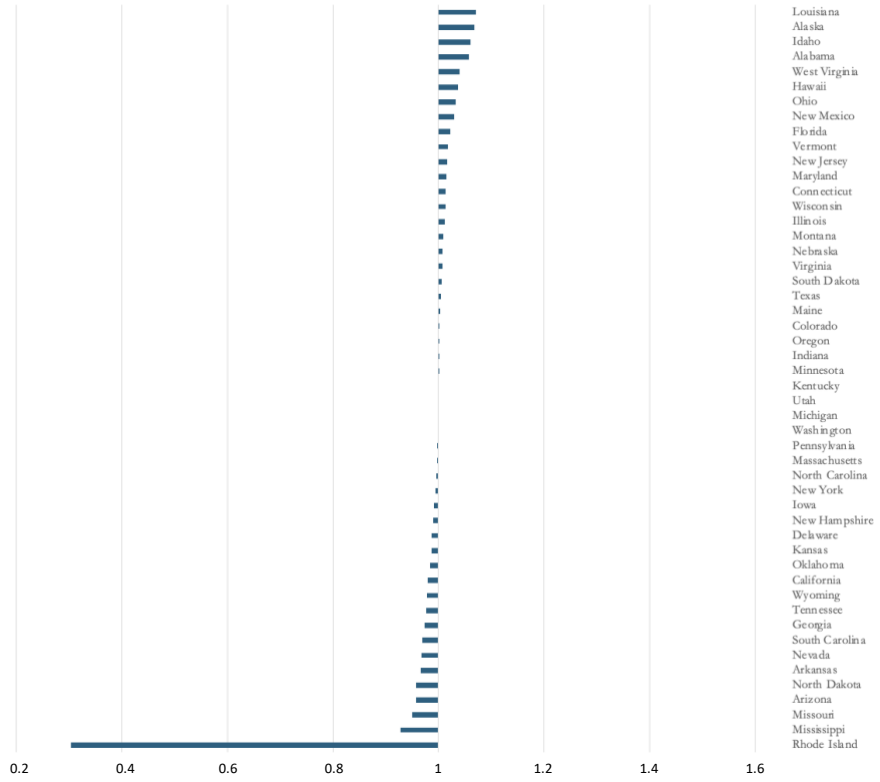
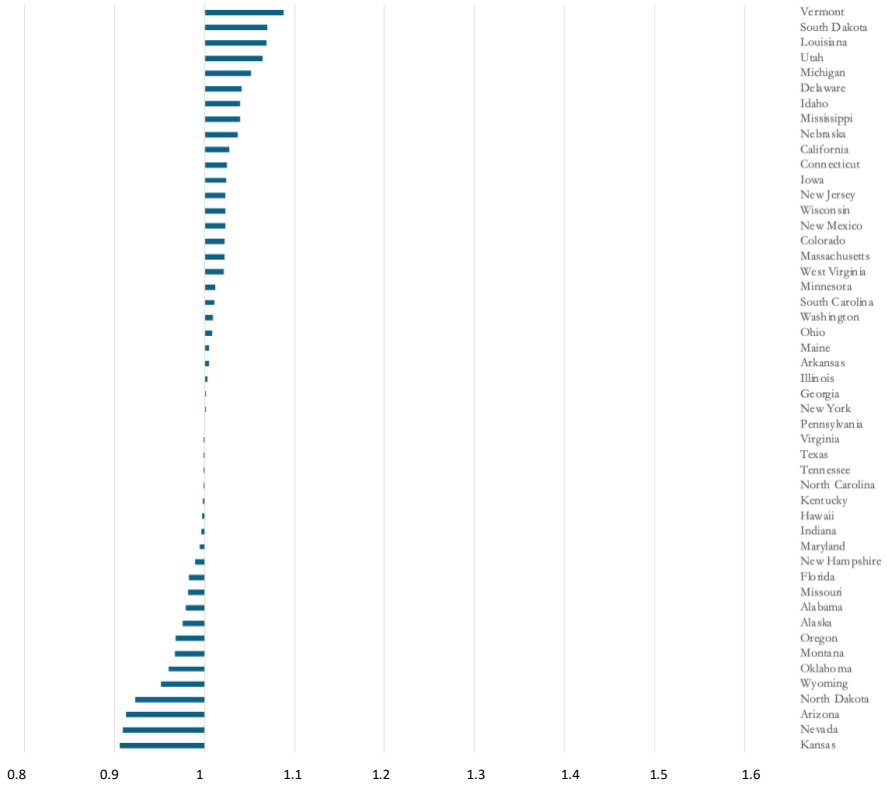


FIGURE 3D

EQUITY INDEX ON STATE FINANCIAL AID BASED ON COUNTY-LEVEL HISPANIC POPULATION



The Relationship Between Index Values and State-Level Credential Completion

To demonstrate the practical application of the index, we show that measures for each community college funding stream (i.e., base appropriations, grants and contracts, financial aid) based on county-level racial diversity were associated with the state-level community college completion outcomes. Notably, interpreting the magnitude of the index depends on the level of different state funding streams and demographic profiles in individual states. For example, for California to increase its state appropriations for Hispanics from 1.04 to 1.05, an additional $4.5 million should be invested into community colleges in counties with more Hispanic residents. The same increase for Montana from 0.93 to 0.94 translates to an increase of $120,000 to community colleges in counties with a higher percentage of Hispanic population.

As presented in *Table 1*, state funding that disproportionately benefits community colleges in whiter counties was associated with a decreased (logged) number of credentials awarded to Black and Hispanic students. For instance, a 0.01 increase in the index measure for state appropriations based on county-level white representation (i.e., 0.01 increase in the ratio of predicted logged state appropriations received by community colleges in whiter counties relative to predicted logged state appropriations received by community colleges in less-white counties) was associated with a 0.95% decrease in the number of credentials to Black students and 0.65% decrease in the number of credentials to Hispanic students three years later.

However, state funding supporting community colleges in counties with more Black or Hispanic residents is largely associated with an increased number of credentials awarded to Black and Hispanic students. For instance, a 0.01 increase in the Hispanic state appropriations index measure (i.e., 0.01 increase in the ratio of predicted logged state appropriations received by community colleges in

counties with more Hispanic residents relative to predicted logged state appropriations received by community colleges in counties with fewer Hispanic residents) was associated with a 2.72% increase in the number of credentials to Hispanic students three years later. There was also a positive spillover influence for Black students – an increase in funding to public community colleges in disproportionately Hispanic counties was associated with a 2.91% increase in the number of credentials to Black students three years later. These findings were relatively consistent across models with one-, two-, and three-year lags.

The index values for state grants and contracts and state-funded financial aid for community colleges do not consistently follow the same pattern of relationships with state-level completions as base appropriations. Grants and contracts to whiter counties negatively correlated with Black and Hispanic completion. However, findings for state grants and contracts to colleges with greater Black and Hispanic representation were less consistent. The index values for financial aid were inconsistent across racial groups and models with different lags. We further tested the relationship between the index and associate degrees and short-term certificates (less than one year of courses) awarded, respectively. Our additional analyses indicate that inconsistent relationships between index values and total credentials awarded were driven by the number of certificates awarded (Appendix C1 and C2).

TABLE 1

COEFFICIENT OF INDEX ON THE NUMBER OF CREDENTIALS AWARDED

INDEX	ONE-YEAR LAG			TWO-YEAR LAG			THREE-YEAR LAG		
	WHITE	BLACK	HISPANIC	WHITE	BLACK	HISPANIC	WHITE	BLACK	HISPANIC
APPROPRIATION INDEX BY WHITE	-0.187	-0.598***	-0.015	-0.403	-0.798***	-0.266	0.012	-0.946***	-0.650**
	(0.308)	(0.167)	(0.218)	(0.484)	(0.212)	(0.229)	(0.210)	(0.210)	(0.198)
APPROPRIATION INDEX BY BLACK	0.608	1.611***	0.877***	0.762	1.075*	0.973*	0.751	0.934**	0.722
	(0.704)	(0.266)	(0.226)	(0.450)	(0.491)	(0.495)	(0.566)	(0.311)	(0.428)
APPROPRIATION INDEX BY HISPANIC	1.690	2.497***	1.591*	2.427**	2.521**	2.351*	2.203*	2.909***	2.716***
	(1.059)	(0.751)	(0.757)	(0.910)	(0.940)	(0.963)	(1.078)	(0.777)	(0.726)
CONTRACTS & GRANTS INDEX BY WHITE	-0.095	-0.732***	-0.241**	-0.021	-0.733***	-0.381**	-0.018	-0.667***	-0.430*
	(0.092)	(0.122)	(0.093)	(0.147)	(0.137)	(0.138)	(0.184)	(0.177)	(0.198)
CONTRACTS & GRANTS INDEX BY BLACK	0.036	0.165***	-0.027	-0.021	-0.014	-0.025	-0.044	0.068*	-0.013
	(0.036)	(0.023)	(0.031)	(0.057)	(0.059)	(0.076)	(0.061)	(0.031)	(0.067)
CONTRACTS & GRANTS INDEX BY HISPANIC	-0.024*	0.012	0.030*	-0.029**	0.015	0.022	-0.032**	-0.002	-0.001
	(0.010)	(0.011)	(0.012)	(0.009)	(0.013)	(0.014)	(0.010)	(0.017)	(0.015)
FINANCIAL AID INDEX BY WHITE	-0.017	-0.259***	-0.240***	-0.022	-0.256***	-0.343**	0.024	-0.158	-0.201
	(0.043)	(0.060)	(0.053)	(0.048)	(0.064)	(0.118)	(0.061)	(0.140)	(0.114)
FINANCIAL AID INDEX BY BLACK	0.015	-0.099**	-0.107**	0.016	-0.104**	-0.114**	0.012	-0.096	-0.082
	(0.032)	(0.037)	(0.035)	(0.040)	(0.040)	(0.041)	(0.050)	(0.050)	(0.056)
FINANCIAL AID INDEX BY HISPANIC	-0.000*	0.000	0.000*	-0.000**	0.000*	0.000*	-0.000**	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

NOTE: * p < .05, ** p < .01, *** p < .001. Standard error in parenthesis. Each coefficient represents one model specification, indicating the relationship between a given index and the completion outcome. All model specifications controlled for the number of total state enrollment (logged), state fixed effect, and year fixed effect

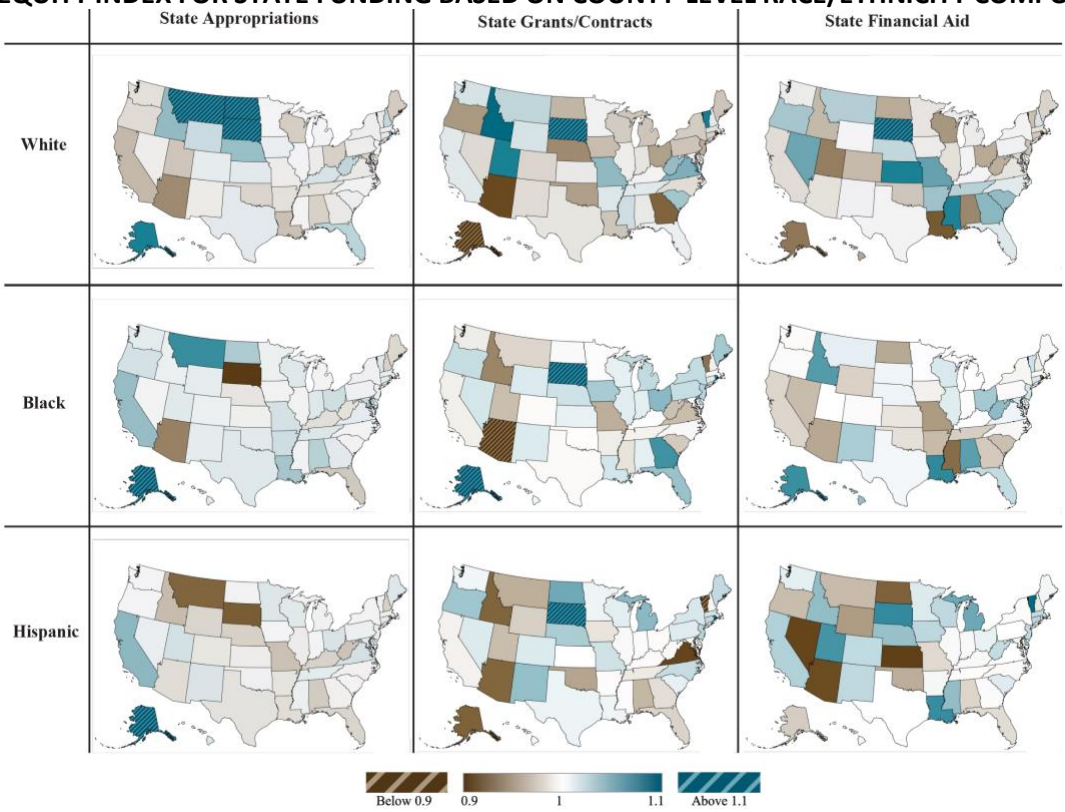
Discussion

States need to move toward funding adequacy and equity to meet their completion goals and address persistent college access and success gaps across racial groups (e.g., Cummings et al., 2021; Dziesinski & Hillman, 2024; Fernandez et al., 2023; Hu & Fernandez, 2024; Hillman et al., 2024). Defining and measuring funding adequacy is a challenge throughout higher education. There are huge funding disparities across four-year public institutions, such as between state flagships and regional publics, which deserve attention (Fernandez et al., 2023). As a result of their lower operating costs, states can use limited funds to make significantly greater progress in addressing funding (in)adequacy in the community college sector when compared to the four-year sector (Fernandez et al., 2023; Hu & Fernandez, 2024; Illinois Commission on Equitable Public University Funding, 2024). Additionally, community colleges disproportionately enroll underrepresented groups, so if states want to address the largest gaps in college access and success, they need to tend to how resources are distributed to community colleges (Mullin, 2010).

We build on prior work that articulates a rationale for advancing community college funding adequacy (Hu & Fernandez, 2024) by developing an index to measure and compare funding disparities in community colleges based on racial diversity. Strengths of the index are that its directionality is meaningful (positive scores indicate colleges are more adequately supported based on county demographics, while negative scores indicate colleges are inadequately supported based on how their county demographics compare to overall state demographics), and it reports the magnitude of funding inadequacy (the size of the scores report how far the state is from funding more diverse counties similarly to more homogenous counties within its specific state context). For each funding stream (base appropriations, grants and contracts, financial aid), we find that there are in-state and across-state variations that correlate with race (See *Figure 4*).

FIGURE 4

EQUITY INDEX FOR STATE FUNDING BASED ON COUNTY-LEVEL RACE/ETHNICITY COMPOSITION



Among the three streams, the most glaring community college funding disparities exist in state appropriations – the largest stream of state funding to public community colleges. Community colleges that serve counties with larger percentages of white residents receive more funding. Conversely, public community colleges that serve counties with greater shares of Hispanic residents receive substantially less funding. Worse yet, *Figure 1D* shows that several states with large or quickly growing Hispanic populations (i.e., Arizona, Colorado, Florida, Texas) have low index scores for adequately funding colleges based on their surrounding Hispanic population. These findings are consistent with the gray peril hypothesis (Lambert et al., 2009; Poterba, 1997), which suggests that as white residents age and schools are seen as primarily serving more diverse students, voters and legislators divest in public education. Our findings are consistent with prior literature that indicates a lack of vertical equity in community college finance as base appropriations represent the largest portion of state funding (e.g.,

Dowd & Grant, 2006), emphasizing the need to challenge racialized funding disparities in state-level conversations on funding adequacy.

In addition to demonstrating that our new index is one way to measure funding adequacy based on how state dollars are distributed relative to racial representation across a state's counties, we showed that the measure has practical, nationally relevant significance for examining disparities in college completion across states among different racial groups. Awarding more adequate (i.e., more money to colleges that serve racially underrepresented students who tend to have greater educational needs) state appropriations to community colleges in disproportionately whiter counties had a negative influence on Black and Hispanic completion. Conversely, when public community colleges in counties with greater Black or Hispanic representation received more adequate funding, Black or Hispanic students were not the only group to benefit. The various models presented in *Table 1* suggest there were positive spillover effects across racial groups when community colleges in high-racial minority counties received greater base appropriations. Specifically, the two- and three-year lag models show that a more progressive funding approach to support community colleges with more potential Hispanic students was positively related to Black, Hispanic, and white college completion. State leaders who wish to meet employers' needs for skilled workers and improve social mobility should take seriously the need to adequately fund colleges in ways that account for the demographics of their surrounding communities.

A couple of states have high index scores and high Hispanic populations (e.g., California, New Mexico). California and New Mexico do not wholly contradict the gray peril hypothesis, but compared to the states with low index scores (i.e., Arizona, Colorado, Florida, Texas), they suggest a need for more nuanced testing of changes in funding adequacy scores. Prior literature offers insights for directions for future research testing the gray peril hypothesis. For instance, Berkman and Plutzer (2004) found that the relationship between demographic changes (e.g., aging, diversifying) and public support for education should account for in-state migration. In their analysis, states that draw older migrants (e.g., Florida) were less likely to maintain funding for schools compared to states with fewer aging migrants, where long-time older residents might be more loyal to their local schools (e.g., California).

The narrower and less direct funding streams (i.e., grants/contracts and financial aid) were not as inequitable as base appropriations. When fundamental changes in state funding models require tremendous amount of leadership and efforts, such as Illinois' legislative efforts to create a commission and develop a new equitable university funding model (e.g., Illinois Commission on Equitable Public University Funding, 2024), well-intended but incremental state funding may be directed to community colleges as grants and contracts to correct for inadequacies in state appropriations that correlate with race. However, even if state grants and contracts are progressively awarded, they are not likely to eliminate gaps in base appropriations unless that stream is expanded by several orders of magnitude. Similarly, while states rely on local appropriations to fund local community colleges, the differences in revenues, such as local property taxes, can put already under-funded colleges further behind (Jacoby, 2023). Thus, state appropriations should be considered a fundamental source to achieve funding adequacy. Additionally, the financial aid index scores approximate "neutrality" (Kolbe & Baker, 2019), which is a form of horizontal equity (i.e., giving similar funding to different groups of students with unique needs), but the reality is that student needs are not neutral, and neither are the needs of community colleges serving underrepresented students (Dowd & Grant, 2006; Dowd et al., 2020).

The time trends (*Figure 1A*, *Figure 2A*, and *Figure 3A*) show that the state index scores have stayed relatively stable over the years. In other words, public community colleges in whiter counties have not only benefited once, but those benefits have accumulated or compounded over the nearly two decades

included in our study. Public community colleges that serve counties with larger shares of Black and Hispanic residents were not only inadequately funded in a single year, but they were also perpetually underfunded relative to counties where white residents exceeded the state average. Progressive funding through state grants and contracts and the narrowing of gaps in financial aid allocations do not appear to have meaningfully closed the inadequacy gap in base appropriations.

Future Research and Application of the Index

Researchers may build on our exploratory work by using this index to test whether funding disparities for community colleges based on racial concentration predict additional state educational and economic outcomes. Future studies can also examine the ways that differences in county demographics explain local funding. Descriptive work has shown that as state appropriations account for smaller and smaller shares of community college expenditures, colleges increasingly rely on local funding (e.g., Hu & Fernandez, 2024). Therefore, it may help advance the study of higher education finance to consider how county demographics influence funding (in)adequacy through local appropriations and how local and state appropriations complement each other to achieve funding adequacy.

However, because community colleges are open access institutions that serve broad swaths of the population, the influence of groups such as parents (Miller, 1996) or the elderly (Figlio & Fletcher, 2012; Ladd & Murray, 2001) may not be as pronounced as their effects on funding primary and secondary schools. Although local governments may be statutorily or economically constrained in their ability to raise revenue to support local colleges, researchers may examine whether counties that are more racially diverse or that have more high-income residents (Colburn & Horowitz, 2003) spend less on community colleges than whiter counties or counties with fewer high-salary earners. Local demographics' influence on state-level funding decisions may also depend on the region's voting power and alignment with the state's political control (Primo & Snyder, 2010; Tandberg, 2010). Future research can use our newly developed index scores and more nuanced racial demographic data (broken down by age cohorts) to test whether state appropriations become more inequitable when school-aged populations become increasingly racially diverse.

As researchers and policymakers continue to explore the definition and operationalization of funding adequacy, our index measure can be converted to real dollars for given amounts of state funding streams, so state leaders can consider how much funding (and in which form) would need to be allocated to make progress toward closing funding disparities and supporting racially diverse communities to equally benefit from their public community colleges. It is worth noting that while the index provides a standardized measure across states and time, the question "How adequate is adequate?" based on the magnitude of the index can only be answered in specific state contexts. Because the levels of state funding greatly vary, the index as a ratio of logged values can mean drastic differences across states. Similarly, each state's demographic profile can be unique in that one standard deviation of the percentage of a certain racial group can represent major numeric differences and complex social and economic history of the local counties. Additionally, the costs of supporting community colleges vary across state contexts. For instance, faculty salaries should be considered within the context of state costs of living and income tax rates, as well as state policies for public employees, including unionization and collective bargaining agreements (Henson et al., 2012). In terms of state-supported financial aid, states vary substantially in the types of programs they use and how well those programs support community college students (Hu et al., 2024; Perna & Leigh, 2018). When the index is converted to real dollars for investing new funding to community colleges, state leaders should consider

whether the infusion would meaningfully help colleges achieve certain goals within local contexts — such as closing the gap in credentials awarded to Black students compared to white students.

Finally, researchers may explore underlying state-level political, economic, and demographic changes that explain variation in the index measures across states to help understand the dynamics that inhibit or advance progress toward adequately funding public higher education. The index, which is a relative measure, should not be used alone to define funding adequacy. Because community colleges, regardless of location and student demographics, have been historically underfunded, state funding distribution should not be considered a zero-sum game. Colleges in disproportionately white counties should not have their funding clawed back and redirected to colleges in counties where racial minority groups are overrepresented. The gains of one student group should not be at the expense of another student group's achievement. Our findings offer new implications for why it is so important to advance the concept of adequacy-based funding with racial equity in higher education finance discussions.

References

Allison, P. (2009). *Fixed effects regression models. Quantitative applications in the social sciences.* Sage.

American Association of Community Colleges. (2024). *Fast facts*. https://www.aacc.nche.edu/wp-content/uploads/2024/02/Fast_Facts_2024.pdf

Bailey, T., Calcagno, J. C., Jenkins, D., Leinbach, T., & Kienzl, G. (2006). Is student-right-to-know all you should know? An analysis of community college graduation rates. *Research in Higher Education, 47*(5), 491–519. https://doi.org/10.1007/s11162-005-9005-0

Baker, B. D., Kolbe, T., & Levin, J. (2022). Toward equitable and adequate public funding for community colleges: Lessons from K-12 education finance. In C. Roellke & J. K. Rice (Eds.), *American higher education: Contemporary perspectives on policy and practice* (pp. 67–90). Information Age Publishing.

Baker, R. B., Klasik, D., & Reardon, S. F. (2018). Race and stratification in college enrollment over time. *AERA Open, 4*(1), 1–28. https://doi.org/10.1177/2332858417751896

Baker, R. B., Solanki, S. M., & Kang, C. (2023). Horizontal and vertical racial segregation in higher education: Examining trends in California public colleges. *The Journal of Higher Education, 94*(1), 60–95. https://doi.org/10.1080/00221546.2022.2131970

Bahr, P. R., Gross, J. L., Slay, K. E., & Christensen, R. D. (2015). First in line: Student registration priority in community colleges. *Educational Policy*, *29*(2), 342–374. https://doi.org/10.1177/0895904813492381

Barr, M. J., & McClellan, G. S. (2018). *Budgets and financial management in higher education.* John Wiley & Sons.

Baum, S., & Kurose, C. (2013). Community colleges in context: Exploring financing of two- and four-year institutions. *Bridging the higher education divide: Strengthening community colleges and restoring the American Dream* (pp. 73–108). Century Foundation.

Belfield, C., Crosta, P., & Jenkins, D. (2014). Can community colleges afford to improve completion? Measuring the cost and efficiency consequences of reform. *Educational Evaluation and Policy Analysis, 36*(3), 327–345. https://doi.org/10.3102/0162373713517293

Berkman, M. B., & Plutzer, E. (2004). Gray peril or loyal support? The effects of the elderly on educational expenditures. *Social Science Quarterly*, *85*(5), 1178–1192. https://doi.org/10.1111/j.0038-4941.2004.00270.x

Billings, M. S., Gándara, D., & Li, A. Y. (2021). Tuition-free promise programs: Implications and lessons learned. *New Directions for Community Colleges*, *2021*(196), 81–95. https://doi.org/10.1002/cc.20485

Billings, M. S., Li, A. Y., Gándara, D., Acevedo, R., Cervantes, D., & Turcios-Villalta, J. (2023). Financing promise programs: Where the money comes from and where the money goes. *New Directions for Community Colleges*, *2023*(203), 9–23. https://doi.org/10.1002/cc.20583

Black, S. E., Cortes, K. E., Lincove, J. A. (2020). Apply yourself: Racial and ethnic differences in college application. *Education Finance and Policy, 15*(2), 209–240. https://doi.org/10.1162/edfp_a_00273

Bryant, A. C., Triplett, N. P., Watson, M. J., & Lewis, C. W. (2017). The browning of American public schools: Evidence of increasing racial diversity and the implications for policy, practice, and student outcomes. *The Urban Review*, *49*, 263–278. https://doi.org/10.1007/s11256-017-0400-6

Calcagno, J. C., Bailey, T., Jenkins, D., Kienzl, G., & Leinbach, T. (2008). Community college student success: What institutional characteristics make a difference? *Economics of Education Review, 27*(6), 632–645. https://doi.org/10.1016/j.econedurev.2007.07.003

Candelaria, C. A., & Shores, K. A. (2019). Court-ordered finance reforms in the adequacy era: Heterogeneous causal effects and sensitivity. *Education Finance and Policy*, *14*(1), 31–60. https://doi.org/10.1162/edfp_a_00236

Cecil, B. (2025, March 6). *What do Republican voters want on higher education?* Third Way. https://www.thirdway.org/memo/what-do-republican-voters-want-on-higher-education

Chen, X., & Simone, S. (2016). *Remedial coursetaking at U.S. public 2- and 4-year institutions: Scope, experience, and outcomes* (NCES 2016-405). U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. https://nces.ed.gov/pubs2016/2016405.pdf

Community College Research Center. (n.d.). *Community college FAQs.* https://ccrc.tc.columbia.edu/community-college-faqs.html

Colburn, C. B., & Horowitz, J. B. (2003). Local politics and the demand for public education. *Urban Studies*, *40*(4), 797–807. https://doi.org/10.1080/0042098032000083812

Coria, E., & Hoffman, J. L. (2016). Financial aid tipping points: An analysis of aid and academic achievement at a California community college. *Community College Journal of Research and Practice*, *40*(2), 160–170. https://doi.org/10.1080/10668926.2014.993441

Cummings, K., Laderman, S., Lee, J., Tandberg, D., & Weeden, D. (2021). *Investigating the impacts of state higher education appropriations and financial aid*. State Higher Education Executive Officers Association. https://sheeo.org/wp-content/uploads/2021/05/SHEEO_ImpactAppropationsFinancialAid.pdf

Deming, D. J., & Dynarski, S. (2010). Into college, out of poverty? Policies to increase the postsecondary attainment of the poor. In P. B. Levine & D. Zimmerman (Eds.), *Targeting investments in children: Fighting poverty when resources are limited* (pp. 283–302). University of Chicago Press.

Domina, T. (2014). Does merit aid program design matter? A cross-cohort analysis. *Research in Higher Education*, *55*(1), 1–26. https://doi.org/10.1007/s11162-013-9302-y

Dougherty, K. J. (1994). *The contradictory college: The conflicting origins, impacts, and futures of the community college*. State University of New York Press.

Dowd, A. (2004). Community college revenue disparities: What accounts for an urban college deficit? *Urban Review, 36*(4), 251–270. https://doi.org/10.1007/s11256-004-2083-z

Dowd, A. C., & Grant, J. L. (2006). Equity and efficiency of community college appropriations: The role of local financing. *The Review of Higher Education, 29*(2), 167–194. https://doi.org/10.1353/rhe.2005.0081

Dowd, A. C., Rosinger, K.O., & Castro, M. F. (2020). Trends and perspectives on finance equity and the promise of community colleges. In L. W. Perna (Ed.), *Higher Education: Theory of Handbook and Research* (Vol. 35, pp. 1–72). Springer. https://doi.org/10.1007/978-3-030-11743-6_7-1

Dowd, A. C., & Shieh, L. T. (2014). The implications of state fiscal policies for community colleges. *New Directions for Community Colleges, 2014*(168), 53–63. https://doi.org/10.1002/cc.20120

Duncombe, W., Robbins, M., & Stonecash, J. (2003). Measuring citizen preferences for public services using surveys: Does a "gray peril" threaten funding for public education?. *Public Budgeting & Finance*, *23*(1), 45–72. https://doi.org/10.1111/1540-5850.2301003

Dziesinski, A., & Hillman, N. (2024). *Adequacy and equity in education finance: How can K-12 contexts inform higher education?* Student Success Through Applied Research (SSTAR) Lab, University of Wisconsin-Madison. https://sstar.wisc.edu/wp-content/uploads/2024/06/sstar_k-12_litreview.pdf

Feng, B., Partridge, M., & Perez-Silva, R. (2019). *Taking measure of Ohio's adequacy gap in school funding*. The Ohio State University, C. William Swank Program in Rural-Urban Policy. https://kb.osu.edu/server/api/core/bitstreams/7574177e-35de-4c58-a7fa-ccf2c5988645/content

Fernandez, F., Hu, X., & Capaldi, M. (2023). *Exploring equitable public higher education funding models in Illinois: Toward adequately funding universities and supporting students.* Partnership for College Completion. https://partnershipfcc.org/wp-content/uploads/2023/05/PCC_ExploringEquitableReport_Final.pdf

Figlio, D. N., & Fletcher, D. (2012). Suburbanization, demographic change and the consequences for school finance. *Journal of Public Economics*, *96*(11–12), 1144–1153. https://doi.org/10.1016/j.jpubeco.2011.07.007

Funk, C., & Hugo Lopez, M. (2022). *A brief statistical portrait of U.S. Hispanics*. Pew Research Center. https://www.pewresearch.org/science/2022/06/14/a-brief-statistical-portrait-of-u-s-hispanics/

Gurantz, O. (2020). What does free community college buy? Early impacts from the Oregon Promise. *Journal of Policy Analysis and Management*, *39*(1), 11–35. https://doi.org/10.1002/pam.22157

Heller, D. E. (1999). The effects of tuition and state financial aid on public college enrollment. *The Review of Higher Education, 23*(1), 65–89. https://doi.org/10.1353/rhe.1999.0023

Henson, S. E., Krieg, J. M., Wassell, C. S., & Hedrick, D. W. (2012). Collective bargaining and community college faculty: What is the wage impact?. *Journal of Labor Research*, *33*, 104-117. https://doi.org/10.1007/s12122-011-9128-3

Hilmer, M. J. (1997). Does community college attendance provide a strategic path to quality education? *Economics of Education Review*, *16*(1), 59–68. https://doi.org/10.1016/S0272-7757(96)00018-0

Hillman, N. Dziesinski, A., & You, E. (2024). D*esigning higher education funding models to promote student success: An introduction to "capacity building" and "equity-based" funding principles.* Student Success Through Applied Research (SSTAR) Lab, University of Wisconsin-Madison. https://sstar.wisc.edu/wp-content/uploads/2024/01/EquityFundReport.pdf

Hu, X. (2023). Using ordinary least squares in higher education research: A primer. In L. W. Perna (Ed.), *Higher education: Handbook of theory and research* (Vol. 39, pp. 1-77). Springer. https://doi.org/10.1007/978-3-031-32186-3_13-1

Hu, X., & Fernandez, F. (2024). *Advancing adequacy-based funding for community colleges in Illinois*. Partnership for College Completion. https://partnershipfcc.org/wp-content/uploads/2024/08/PCC_ExploringEquitableReport_v5.pdf

Hu, X., Fernandez, F., Qiu, Y., & Capaldi, M. (2024). The good, the bad, and the balanced: A typology of state merit-aid programs for community college students. *Community College Review*, *52*(3), 289–314. https://doi.org/10.1177/00915521241238753

Hugo Lopez, M., Krogstad, J. M., & Flores, A. (2018). *Key facts about young Latinos, one of the nation's fastest-growing populations*. Pew Research Center. https://www.pewresearch.org/short-reads/2018/09/13/key-facts-about-young-latinos/

Illinois Commission on Equitable Public University Funding. (2024). *Report on the commission's recommendations.* https://www.ibhe.org/assets/files/Funding/Illinois_Commission_on_Equitable_Public_University_Funding_Report.pdf

Jacoby, T. (2023). *All eyes on Texas: Community colleges focus on preparing the workforce of tomorrow.* The Federal Reserve Bank of Dallas. https://www.dallasfed.org/-/media/Documents/research/pubs/23college.pdf

Jenkins, D., & Belfield, C. (2014). Can community colleges continue to do more with less? *Change, 46*(3), 6–13. https://doi.org/10.1080/00091383.2014.905417

Johnson-Ahorlu, R. N., Alvarez, C. L., & Hurtado, S. (2013). Undermining the master plan: Divestment in higher education and student experiences. *Journal of College Admission, 218*, 22–35. https://files.eric.ed.gov/fulltext/EJ1011896.pdf

Kahlenberg, R. D. (2015). *How higher education funding shortchanges community colleges*. New York, NY: The Century Foundation. https://tcf.org/content/report/how-higher-education-funding-shortchanges-community-colleges/

Kisker, C. B., Cohen, A. M., & Brawer, F. B. (2023). *The American community college*. John Wiley & Sons.

Kolbe, T., & Baker, B. D. (2019). Fiscal equity and America's community colleges. *Journal of Higher Education, 90*(1), 111–149. https://doi.org/10.1080/00221546.2018.1442984

Koos, L. V. (1947). Rise of the people's college. *The School Review*, *55*(3), 138-149. https://doi.org/10.1086/441377

Ladd, H. F., & Murray, S. E. (2001). Intergenerational conflict reconsidered: County demographic structure and the demand for public education. *Economics of Education Review*, *20*(4), 343–357. https://doi.org/10.1016/S0272-7757(00)00058-3

Lambert, D. M., Clark, C. D., Wilcox, M. D., & Park, W. M. (2009). Public education financing trends and the gray peril hypothesis. *Growth and Change*, *40*(4), 619–648. https://doi.org/10.1111/j.1468-2257.2009.00503.x

Leslie, L. L., & Brinkman, P. T. (1987). Student price response in higher education. *The Journal of Higher Education, 58*, 181–204. https://doi.org/10.1080/00221546.1987.11778239

Ma, J., & Pender, M. (2023). *Trends in college pricing and student aid 2023*. College Board. https://research.collegeboard.org/media/pdf/Trends%20Report%202023%20Updated.pdf

McKeown-Moak, M. P. (1999). Higher education funding formulas. *New Directions for Higher Education, 1999*(107), 99–107. https://doi.org/10.1002/he.10710

McKinney, L., & Hagedorn, L. S. (2017). Performance-based funding for community colleges: Are colleges disadvantaged by serving the most disadvantaged students? *The Journal of Higher Education, 88*(2), 159–182. https://doi.org/10.1080/00221546.2016.1243948

Melguizo, T., Witham, K., Fong, K., & Chi, E. (2017). Understanding the relationship between equity and efficiency: Towards a concept of funding adequacy for community colleges. *Journal of Education Finance, 43*(2), 195–216. https://www.jstor.org/stable/45093659

Mendoza, P., Mendez, J. P., & Malcolm, Z. (2009). Financial aid and persistence in community colleges: Assessing the effectiveness of federal and state financial aid programs in Oklahoma. *Community College Review*, *37*(2), 112–135. https://doi.org/10.1177/0091552109348045

Miller, C. (1996). Demographics and spending for public education: a test of interest group influence. *Economics of Education Review*, *15*(2), 175–185. https://doi.org/10.1016/0272-7757(95)00030-5

Miller, C., & Weiss, M. J. (2022). Increasing community college graduation rates: A synthesis of findings on the ASAP model from six colleges across two states. *Educational Evaluation and Policy Analysis*, *44*(2), 210–233. http://doi.org/10.3102/01623737211036726

Monarrez, T., Hernandez, F., & Rainer, M. (2021). *Impact of state higher education finance on attainment*. Urban Institute. https://www.urban.org/sites/default/files/publication/104518/impact-of-state-higher-education-finance-on-attainment_2.pdf

Mullin, C. M. (2010). *Rebalancing the mission: The community college completion challenge*. https://files.eric.ed.gov/fulltext/ED522995.pdf

Mullin, C. M., Baime, D. S., & Honeyman, D. S. (2015). *Community college finance: A guide for institutional leaders*. San Francisco, CA: Jossey-Bass.

Mullin, C. M., & Honeyman, D. S. (2007). The funding of community colleges: A typology of state funding formulas. *Community College Review, 35*(2), 113–127. https://doi.org/10.1177/0091552107306409

National Association of State Student Grant & Aid Programs. (2022). *53rd annual survey report on state-sponsored student financial aid: 2021-2022 academic year.* https://www.nassgapsurvey.com/survey_reports/2021-2022-53rd.pdf

National Center for Education Statistics. (2022). *Total revenue of public degree-granting postsecondary institutions, by source of revenue and level of institution: Selected fiscal years, 2007-08 through 2020-21.* https://nces.ed.gov/programs/digest/d22/tables/dt22_333.10.asp

Ngo, F., & Astudillo, S. (2019). California DREAM: The impact of financial aid for undocumented community college students. *Educational Researcher*, *48*(1), 5–18. https://doi.org/10.3102/0013189X18800047

Ortagus, J. C., & Hu, X. (2019). Does the community college pathway influence the selectivity of students' destination 4-year institution?. *Community College Review*, *47*(4), 434–461. https://doi.org/10.1177/0091552119867126

Perna, L. W., & Leigh, E. W. (2018). Understanding the promise: A typology of state and local college promise programs. *Educational Researcher*, *47*(3), 155-180. https://doi.org/10.3102/0013189X17742653

Plutzer, E., & Berkman, M. (2005). The graying of America and support for funding the nation's schools. *Public Opinion Quarterly*, *69*(1), 66–86. https://doi.org/10.1093/poq/nfi010

Poterba, J. M. (1997). Demographic structure and the political economy of public education. *Journal of Policy Analysis and Management*, *16*(1), 48–66. https://doi.org/10.1002/(SICI)1520-6688(199724)16:1%3C48::AID-PAM3%3E3.0.CO;2-I

Primo, D. M., & Snyder, Jr, J. M. (2010). Party strength, the personal vote, and government spending. *American Journal of Political Science, 54*(2), 354–370.

Prescott, B., Koch, Z., & Jones, D. (2021). *Considering a standard approach to determining institutional funding adequacy.* The National Center for Higher Education Management Systems. https://sheeo.org/wp-content/uploads/2021/06/210407-Institutional-Adequacy-Paper-FINAL.pdf

Richmond, M., Hahnel, C., Harding, L., & Lee, N. (2024). *Strengthening state higher education funding: Lessons learned from K-12.* Bellwether. https://files.eric.ed.gov/fulltext/ED656101.pdf

Romano, R. M., & Palmer, J. C. (2023). Funding adequacy and the community college. *New Directions for Community Colleges, 2023*(203), 165–172. https://doi.org/10.1002/cc.20595

Romano, R. M & Palmer, J. C. (2016). *Financing community colleges: Where we are, where we're going.* Rowman & Littlefield.

Rosinger, K. O., Ortagus, J., Kelchen, R., Cassell, A., & Brown, L. C. (2022). New evidence on the evolution and landscape of performance funding for higher education. *The Journal of Higher Education*, *93*(5), 735–768. https://doi.org/10.1080/00221546.2022.2066269

Santiago, D., Arroyo, C., & Cuellarsola, L. (2024). *Latinos in higher education: 2024 compilation of fast facts*. Excelencia in Education. https://www.edexcelencia.org/research/publications/latinos-higher-education-2024-compilation-fast-facts

Sosina, V. E., & Weathers, E. S. (2019). Pathways to inequality: Between-district segregation and racial disparities in school district expenditures. *AERA Open*, *5*(3). https://doi.org/10.1177/2332858419872445

Stange, K. (2012). Ability sorting and the importance of college quality to student achievement: Evidence from community colleges. *Education Finance and Policy*, *7*(1), 74–105. https://www.jstor.org/stable/10.2307/educfinapoli.7.1.74

Stephenson, A. L., Heckert, A., & Yerger, D. B. (2016). College choice and the university brand: Exploring the consumer decision framework. *Higher Education*, *71*, 489–503. https://doi.org/10.1007/s10734-015-9919-1

Tamir, C. (2021). *Key findings about Black America in 2019*. Pew Research Center. https://www.pewresearch.org/short-reads/2021/03/25/key-findings-about-black-america/

Tandberg, D. A. (2010). Politics, interest groups and state funding of public higher education. *Research in Higher Education*, *51*, 416–450.

The Civic Federation. (2018). *An examination of the finances of Illinois community colleges*. https://www.civicfed.org/civic-federation/blog/examination-finances-illinois-community-colleges

Thompson, M. D., & Riggs, R. (2000). Institutional expenditure patterns and the facilitation of mission. *Community College Review, 27*(4), 1–15. https://doi.org/10.1177/009155210002700401

Titus, M. A. (2006). Understanding college degree completion of students with low socioeconomic status: The influence of the institutional financial context. *Research in Higher Education, 47*(4), 371–398. https://doi.org/10.1007/s11162-005-9000-5

Turner, E. O. (2020). *Suddenly diverse: How school districts manage race and inequality*. University of Chicago Press.

Umbricht, M., 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. https://doi.org/10.1177/0895904815614398

U.S. Census Bureau. (2023). *Quick facts: United States*. https://www.census.gov/quickfacts/

Van Noy, M., Weaver, A., Forbes, A., & Bragg, D. (2023). The community college role in economic development: A conceptual model. Education and Employment Research Center, Rutgers University School of Management and Labor Relations. https://sites.rutgers.edu/eerc-hii/wp-content/uploads/sites/609/2023/12/The-Community-College-Role-in-Econ.-Dev.-EERC-12.2023.pdf

Velasco, T., Fink, J., Bedoya, M., & Jenkins, D. (2024). *Tracking transfer: Four-year institutional effectiveness in broadening bachelor's degree attainment.* Community College Research Center, Aspen Institute's College Excellence Program, and the National Student Clearinghouse Research Center. https://ccrc.tc.columbia.edu/wp-content/uploads/2024/02/tracking-transfer-four-year-institutional-effectiveness-1.pdf

Weiss, M. J., Ratledge, A., Sommo, C., & Gupta, H. (2019). Supporting community college students from start to degree completion: Long-term evidence from a randomized trial of CUNY's ASAP. *American Economic Journal: Applied Economics*, *11*(3), 253–297. http://doi.org/10.1257/app.20170430

Welch, J. G. (2014). HOPE for community college students: The impact of merit aid on persistence, graduation, and earnings. *Economics of Education Review*, *43*, 1–20. https://doi.org/10.1016/j.econedurev.2014.08.001