The Role of the Race, Income, and Funding on Student Success:
An Institutional Level Analysis of California Community Colleges

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The United States is no longer considered the world leader in producing the largest proportion of young adults with college degrees. Out of the twenty-five countries belonging to the Organization for Economic Co-operation and Development (OECD), the United States moved from being ranked first in 1995 to fourteenth in 2008 in the percent of students who entered college and obtained a four-year degree.[1] Even more troubling is the stubbornly wide gap in four-year degree attainment rates between students of different socioeconomic, racial, and ethnic backgrounds. Recent statistics show that 26 percent of low-income students attain a bachelor's degree, compared with 59 percent of high-income students within six years.[2] Similarly, 41 percent of white students who started at four-year institution in 2004 graduated with a bachelor's

degree, compared with 28 percent of Latino students and 20 percent of African-American students.[3]

In 2009, the Obama administration attempted to address these issues in part through the American Graduation Initiative, which would have invested approximately $12 billion in community colleges over ten years to help students progress through college to a certificate or a degree. Even though the initiative was rejected by the Senate, partly due to contracted budgets, it strongly communicated that community colleges ought to play an increasingly larger role in producing college degrees (that is, associate degrees, and baccalaureate degree attainment rates through transfer) and prepare low-income and racial/ethnic minorities for the workforce (that is, certificates related to local market demands). To harness this potential, community colleges will need to increase overall student success, especially for high needs students, in an environment where state and local funding is decreasing. Recent figures estimated by Anthony P. Carnevale and Jeff Strohl of Georgetown University illustrate that the proportion of low-income and racial and ethnic minorities first enrolling at a community college has been increasing over time.[4] And according to recent findings from the Delta Cost Project at the American Institutes for Research, public community colleges receive substantially less state dollars per full time equivalent student than public four-year colleges.[5] Since significant proportions of low-income and minority students attend public two-year institutions, community colleges have enormous potential to narrow the racial and ethnic achievement gap that has historically plagued higher education.

In this paper, we explore the relationships between a community college's effectiveness and three factors: the amount of state and local funding it receives, the racial and ethnic composition of its student body, and its socioeconomic status measured by median income levels of households surrounding the college. We draw on four strands of research to frame our analysis: (1) human capital theory,[6] (2) school finance,[7] (3) school-based poverty,[8] and (4) school segregation.[9] To measure community college effectiveness, we employ California's Student Progress and Achievement Rate (SPAR).[10] We use this indicator instead of other performance measures because it is calculated based on a student cohort model and measures multiple outcomes for community college students.

The study employs a unique dataset constructed using recently released state and national data from the California Community College Chancellor's Office (CCCCO), the State of California, and the National Center of Education Statistics (NCES). Although the study's findings are

calculated using data on California community colleges, they provide important insights for other community colleges across the nation as they struggle with decreasing public financial support, maintaining their mission of open access, and providing high quality education, particularly for the most underserved student groups.

This study presents descriptive statistics and results from bivariate and regression analyses to better understand the associations between these three factors and SPAR. It is important to note that the results presented in this paper are correlational, not causal. Indeed, it is likely that different types of colleges attract different types of students. For example, community colleges located in more affluent areas may be better at attracting academically average or above average students as well as students who are highly motivated to perform well in college. Thus differences on any measure of student success, including SPAR, may be explained more by the types of students community colleges attract than by their ability to better prepare their students. This is known as self-selection in economic literature. Given that we are unable to control for self-selection in our analysis, our estimates may be biased. Future papers examining the relationship between student success and racial and ethnic diversity as well as neighborhood wealth should control for this bias before making any type of causal inference.

The material in this paper is presented in four stages. First, we provide a brief description of California's community colleges, paying attention in particular to how they are governed and funded by state government. Second, we present a description of the sample, variables, and methods used to conduct our analysis. Third, we report the results of the analyses. Fourth, we offer some initial conclusions and policy directions in this area.

A DEMOGRAPHIC PROFILE OF CALIFORNIA COMMUNITY COLLEGE STUDENTS

California has the largest community college system in the nation. It is composed of 112 community colleges and 72 districts. According to the Legislative Analyst Office, the State of California enrolls about 22 percent of all U.S. community college students. Recent estimates based on 2008 data show that about 1.6 million full-time equivalent (FTE) students attend a California community college. Over 50 percent of these students are categorized as underrepresented minorities (that is, Latino, African American, and Native American students).[11] Compared to the

past, California community colleges are enrolling more Latino students and fewer white students.[12] From 1997 to 2003, the percentage of Latino community college students grew by five points; conversely, the percentage of white students dropped by six points during the same time period.[13] These shifts reflect parallel demographic changes in the general U.S. population.

One reason why many students, particularly underrepresented students, start their higher education at a community college in California is that they are open access, have among the lowest student fees in the country, and allow needy students to qualify for fee waivers. Such provisions make attending college a possibility for many students who may not have the financial means or adequate preparation to attend a four-year institution at the start of their college experience.

FUNDING STRUCTURE OF THE CALIFORNIA COMMUNITY COLLEGE SYSTEM

The current funding structure of the California Community College System (CCCS) is built out of two major regulations: Proposition 13 (passed in 1978) and Proposition 98 (passed in 1988). Proposition 13 limits the amount of tax that can be levied on property, effectively transferring the responsibility of funding community colleges from the local to the state government. Proposition 98 requires a minimum percentage of state revenues to be spent on the K–14 system. After its passage, Proposition 98 guaranteed California community colleges 10.9 percent of the state's education funding, but the system traditionally has received a slightly lower percentage and this has been a point of contention with the K–12 system. Because of this joint funding structure, community colleges share 34 percent of the K–14 state budget with primary and secondary schools. Consequently, community colleges often receive less funding than what was initially set aside for them. This translates into billions of dollars in lost revenue for California's community colleges.

Each fiscal year, the state allocates operating funds to the community college system, which are then reallocated to the 72 community college districts. Before 2006, the state used program-based funding (PBF), which is a textbook example of an incremental budget formula that uses the previous year to adjust for inflation, expansion of services, as well as differences in local property taxes from 1992 until 2006. The formula was established in the early 1990s, and it served to allocate resources until it was changed after the passage of SB 361 in 2007. The goal of

SB 361 was to equalize funding and strived for fairness, simplicity and predictability. It equalized funding for credit, non-credit, and enhanced non-credit FTE students across all districts, took into account economies of scales, and tried to ensure that smaller districts received adequate funds to operate and encourage student success. A limitation of the current funding structure is that it fails to factor in the increasing numbers of students from academically and culturally diverse backgrounds that California community colleges seek to serve. Consequently, the amount of funding community colleges receive is based primarily on the number of students they enroll the previous year and not on the *type of student* they enroll. In addition to these inequities, there is evidence that the amount of funding community colleges receive is not adequate to provide the quality of services needed to promote student success. There is also evidence showing that California has one of the highest student-to-counselor ratios in the nation, with ratios reaching 1,700 to 1.[14] Finally, even though the state has established a target funding level for its community colleges, it has funded the system well below this percentage for decades. Because of this, many community colleges in California lack the resources and funding to develop or expand new programs and improve the quality of current services.

GOVERNANCE FRAMEWORK OF CALIFORNIA COMMUNITY COLLEGES

The framework that governs community colleges is similar to that which governs K–12. Although community colleges were legally separated from the K–12 system in 1967, community colleges are still governed at the local level. Each community college district is an independent local government entity overseen by an elected board of trustees. Local boards are in charge of developing administrative policies, developing the curriculum, selecting program offerings, and negotiating with unions representing instructional staff.[15] These boards appoint a district chancellor or a college president to serve as the chief executive officer. Like the K–12 system in the state, California community colleges are heavily unionized. Collective bargaining units represent most of the employees at community colleges, who have tenure and benefits similar to K–12 teachers. Support staff are hired and promoted under a civil service system. The heavily decentralized governance structure of community colleges stand in contrast with the more centralized governing structure of the University of California (UC) and California State

University (CSU) systems. The UC and CSU systems each have a unique governing board that provides system-wide administrative and curricular guidelines, while guaranteeing individual campus autonomy.

METHODOLOGY

Data

To conduct this study, we draw data from four state sources and one national source: (1) the Accountability Report for California Community Colleges (ARCC), (2) the Management and Information System (MIS), (3) the Fiscal Data Abstract, (4) California Postsecondary Education Commission (CPEC), and the (5) Integrated Postsecondary Education Data System (IPEDS).[16]

Sample

The final sample is composed of 107 of the 112 community colleges that make up the California Community College System. This sample represents approximately 95 percent of the colleges in the system.[17] Our data for different variables stem from 2000 to 2012, but in most cases we are able to employ several years of data to smooth out any year-to-year variations.

Dependent Variables

The main dependent variable that we use in our analysis is SPAR, which is measured annually as part of the ARCC. The ARCC is published by the California Community College Chancellor's Office (CCCCO) in order to meet a legislative requirement stated in Assembly Bill 1417. The ARCC presents a series of performance indicators that assess community colleges on their multiple missions. We also examine the percent of students who transferred to a four-year institution, the total number of associate degrees awarded, and the total number of certificates awarded in our bivariate analysis.

Student Progress and Achievement Rate (SPAR). The Student Progress and Achievement Rate is considered by ARCC as a community college's overall measure of success. It is calculated based on tracking

the progress and outcomes of entering student cohorts over six years. First-time students who show intent to complete (that is, who over six years completed at least twelve credits and attempted degree-applicable math or English course or a threshold-level occupational course) and who achieve any of the following outcomes within six years: (1) transferred to a four-year college, (2) attained an associate in arts degree or an associate in science degree, (3) earned a certificate (18 units or more, or 12–17 units if the certificate was approved by the chancellor's office) or (4) achieved "transfer directed" or "transfer prepared" status increase a community college's SPAR rate. To facilitate our analysis, we averaged SPAR over three cohorts of students: 2003–04 to 2005–06. The average SPAR rate over these three cohorts is 52.2 percent; SPAR rates range from 26.9 to 70.7 percent.

Percent of Transfer Students. Percent of transfer students is a cohort-based variable that colleges calculate by tracking cohorts of first-time students for six years to determine if the students show a behavioral intent to transfer. In other words, if a student has completed 12 credit units and attempted transfer-level math or English, he or she is considered on a track toward transfer. We averaged Percent of transfer students across six cohorts of students (2000–01 to 2005–06); the average percent of students who transferred in our dataset is 38.9 across all community colleges; transfer rates range from 13.3 to 59.5 percent across the cohorts we examine.

Total Number of Associate Degrees. Total number of associate degrees is measured as the total number of associate degrees awarded in a specific academic year. We calculated an average for total number of degrees awarded across six academic years: 2005–06 to 2010–11. Over these years, California community colleges awarded a total of 84,633 associate degrees. The number of associate degrees awarded ranged from 107 to 2,663.

Total Number of Certificates. Total number of certificates is measured as the total number of certificates awarded—irrespective of the credits required—in a specific academic year. We calculated an average for the total number of certificates awarded across six academic years: 2005–06 to 2010–11. The number of certificates totaled 33,193 and ranged from 23 to 1,859 certificates.

Independent Variables

Proportion of Underrepresented Minorities. In California, underrepresented minorities are students who consider themselves African-American, Latino and Native-American. For this study, we used a six-year average (2005–06 to 2010–11) of the proportion of students enrolled in a college that was African-American or Latino as a proxy for the racial and ethnic composition of the college student body. The proportion of underrepresented minorities across sampled colleges ranged from 11.8 to 90.9 percent.

College Socioeconomic Status. We measure a college's socioeconomic status by the median family income of the location[18] surrounding each community college as measured in 2012. Median family income of location ranged from \$29,221 to \$157,995.[19] Even though this variable is correlated with local funding (r = 0.31), it cannot fully explain the amount of funding community colleges received through local property taxes. We thus argue that college socioeconomic status cannot be considered a strong proxy for local funding.

State and Local Funding. We measure state and local funding by the amount of funding that a community college received from state and local government per FTE in 2010. The average amount of state funding granted per California community college student was approximately \$3,370; the average amount of local funding granted per California community college student was roughly \$2,290. State funding ranged from \$587 to \$6,583 per FTE; local funding ranged from \$758 to \$7,870 per FTE.

Model

The equation below specifies the main model:

$$\text{SPAR}_c = \alpha_c + \text{URMQ}_c\beta_{\text{URMQ}} + \text{SESCOLLQ}_c\beta_{\text{SESCOLLQ}} + \text{SFUND}_c\beta_{\text{SFUND}} + \text{LFUND}_c\beta_{\text{LFUND}} + \text{CONTROLS}_c\beta_{\text{CONTROLS}} + u_c$$

where URMQ is the percent of underrepresented minority students enrolled in a college, divided into quartiles; SESCOLLQ is the college socioeconomic status divided into quartiles; SFUND is the amount of state funding a college receives per FTE in thousands; LFUND is the amount of

local funding a college receives per FTE in thousands; and CONTROLS is a vector of variables that measure other student population and institutional characteristics. We use a stepwise regression approach to run several models that measure the relationship between a college's overall student success and its racial and ethnic student makeup, socioeconomic status, and the amount of state and local funding it received.

According to University of Chicago professor Gary S. Becker,[20] these models can be considered simple production functions and ought to control for variables that, according to economic and education literature, are associated with degree and certificate attainment.

Aggregated at the collegiate-level, control variables include a number of student demographic characteristics: female (six-year average), traditional age (six-year average base category nontraditional age over 25 years old), and part-time (six year average of proportion of students attending part-time). We also control for the academic preparation of the types of students a college enrolls in two ways. First, we factor in the average Academic Performance Index (API) score for high schools that feed into each community college from 2005 to 2010. Second, we include a variable that measures the number of students who were placed into the third and fourth lowest levels of the developmental math sequence at their community college[21] between 2004 and 2006. We include additional controls for institutional characteristics from IPEDS such as: institutional size (large versus small), vocational quartile (quartile based on the proportion of vocational certificates awarded), and location (base category urban).

RESULTS

Bivariate Analysis

Association between Proportion of URM and Measures of Student Success. Consistent with findings from the K–12 literature,[22] we found statistically significant differences in the proportion of URM students enrolled in a college and a college's SPAR rate. Whereas colleges in the lowest URM student quartile (11.8 percent 21.5 percent) exhibited an average SPAR rate of 57 percent, colleges in the highest URM student quartile (48.7 percent to 90.9 percent) showed a SPAR rate of less than 45 percent, a difference of approximately twelve percentage points (see Table 1). We found a similar statistical difference when examining the relationship between the proportion of URM students and percent of students

exhibiting a behavioral intent to transfer. Colleges in the lowest URM student quartile showed an average transfer rate of 42 percent compared with a transfer rate of 33 percent for colleges in the highest URM student quartile. However, we found no statistically significant differences of attending colleges with higher proportions of URM in terms of students obtaining an associate degree or certificate. These contradictory findings may stem from the way these performance variables are measured.

Association between Socioeconomic Status and Academic Performance of the Colleges. Results from our correlational analysis also suggest that college socioeconomic status is positively and statistically associated with SPAR and percent of transfer students, but bear no statistically significant relationship with associate degrees or certificates (see Table 1). The fact that transfer and SPAR are cohort-based measures suggest again that it is important to examine outcomes for cohorts of students instead of the total number of awards conferred in a specific academic year, which may include students from many different cohorts.

Association between State and Local Funding and Measures of Student Success. We find a negative and statistically significant association between state funding and SPAR and percent of transfer students; conversely, we find a positive and statistically significant association between local funding and SPAR and percent of transfer students (see Table 2). With respect to the average number of degrees granted (that is, associate degrees and certificates), we find that they are not statistically related with state or local funding.

We also find that the amount of state funding a community college receives per FTE does not statistically differ by the proportion of URM students they enroll (see Table 3). For example, colleges with student populations composed of less than approximately 22 percent of underrepresented students (lowest quartile) received on average $3,101 per FTE while colleges with student populations composed of more than 49 percent of underrepresented students (highest quartile) received almost $3,650 per FTE. The fact that colleges irrespective of the proportion of URM students they enroll receive roughly the same of amount of state funding per FTE may be traceable to the current funding formula. Our results also suggest that colleges with student populations composed of higher proportions of URM students receive less local funding compared with colleges with students populations composed of lower proportions of URM students. These differences are statistically

TABLE 1

Average Educational Outcomes by Racial and Ethnic Composition
of the Students and College Socioeconomic Status

	State Average	Proportion of Under-represented Minorities				Local Median Family Income (College SES)			
		Lowest	Mid Low	Mid High	Highest	Lowest	Mid Low	Mid High	Highest
Student Progress and Achievement Rate (SPAR): Degree/Certificate/Transfer—Three cohorts	52%	57%	55%	51%	45% **	45%	53%	53%	57% **
Transfer-Six cohorts	39%	42%	42%	38%	33% ***	32%	38%	39%	47% ***
Associate Degrees (AA)—Six year average	749	657	850	795	717	612	860	877	705
Certificates—Six year average	373	262	383	392	492	260	433	509	336

* p < 0.10
** p < 0.05
*** p < 0.01

Note: According to the College Board, 84,374 associate degrees and 47,884 certificates were awarded by California community colleges in 2009–10. ARCC reports that 112,327 were awarded by California community colleges in 2010–11.

Source: Data compiled from California Community College Chancellor's Office Management and Information System (MIS) and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS).

TABLE 2

Average Educational Outcomes by Average State and Local Funding per FTE

	State Funding					Local Funding			
	State Average	Lowest	Mid Low	Mid High	Highest	Lowest	Mid Low	Mid High	Highest
Student Progress and Achievement Rate (SPAR): Degree/Certificate/Transfer—Three cohorts	52%	58%	52%	51%	47% **	48%	50%	54%	58% **
Transfer-Six cohorts	39%	43%	40%	39%	32% ***	35%	37%	40%	44% ***
Associate Degrees (AA)—Six year average	749	769	693	1001	622	789	884	669	718
Certificates—Six year average	373	355	379	437	346	425	416	368	286

*p < 0.05
**p < 0.01

Source: Data compiled from California Community College Chancellor's Office Management and Information System (MIS) and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS).

TABLE 3

Differences in State and Local Funding per FTE by Racial and Ethnic Distribution of the Students and College Socioeconomic Status

	State		Local	
URM-quartile				
Lowest (11.8%–21.5%)	3,101		3,051	**
Mid Low (21.7%–34.8%)	3,060		2,431	**
Mid High (35.2%–48.5%)	3,669		1,820	**
Highest (48.7%–90.9%)	3,649		1,824	**
SES College-quartile				
Lowest ($29,221–$50,784)	4,212	**	1,721	**
Mid Low ($50,932–$62,473)	3,213	**	2,210	**
Mid High ($62,916–$81,617)	3,340	**	2,140	**
Highest ($81,718–$157,995)	2,617	**	3,042	**

*p < 0.05
**p < 0.01
Source: Data compiled from California Community College Chancellor's Office Management and Information System (MIS) and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS).

significant at the one percent level. What these results suggest is that colleges with higher proportions of URM students are not properly compensated by the state for the lower amounts of funding that they received. By contrast, we find that the amount of state and local funding that community colleges receive differ significantly by its socioeconomic status. Colleges located in wealthier areas receive more local funding but less state funding than colleges located in poorer areas ($p < 0.01$).

In summary, results from our bivariate analysis illustrate that colleges located in the third and fourth quartiles (largest proportions) of URM students report a SPAR rate that are ten and twelve percentage points lower than colleges located in the first quartile (lowest proportion) in terms of SPAR. We found the opposite trend in terms of socioeconomic status of the colleges. Colleges located in the wealthiest areas (fourth quartile) report a SPAR rate that is twelve percentage points higher than colleges located in the poorest areas (first quartile). In the next section, we report results from our regression analysis where we control institutional level factors associated with SPAR.

Regression Analysis

Results from our regression analysis suggest a negative and statistically significant association between the racial and ethnic composition of a college and SPAR. Holding all else constant, we find that colleges where URM students represent between 35 percent and 49 percent of their student population (third quartile) experience about a 5 percent decrease on SPAR compared to colleges where URM students represent less than 22 percent of the student population (first quartile; see Table 4). We see that this statistically significant and negative association prevails and becomes even stronger when we contrast colleges in the highest URM student quartile against those with the lowest quartile of underrepresented minorities on their students' academic performance. Compared with colleges classified as having the lowest proportion of underrepresented students, colleges classified as having the highest proportion of URM (above 49 percent) experience a 10 percent decrease on SPAR holding all else constant. Consistent with economic literature, we observe a negative and statistically significant association between college socioeconomic status and SPAR. Using the highest socioeconomic status quartile as our base category (income > \$81,718), colleges located in the lowest income areas (income < \$50,784) experience an eight percent decrease on SPAR. Further, colleges located in middle-to-low income areas (\$50,784 to \$62,473) suffer a loss of over 3 percent on SPAR compared against colleges located in high-income areas.

The above mentioned results suggest that colleges with student populations composed of over 35 percent of underrepresented minorities have significantly lower SPAR rates than less racially isolated colleges. Analogous evidence is found in literature exploring the effects of segregation on student performance at the K–12 level.[23] Similarly, colleges located in less wealthy areas underperform on SPAR compared to those in the highest income areas.

CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Increasing student success in community colleges has become a central policy focus largely tied with maintaining U.S. standing in the global economy. Decreasing government funding and shifts in the demographic profile of community college students have called into question whether higher education systems as currently designed are equipped to increase

TABLE 4
Association between Funding and Student Composition and Student Progress and Attainment Rate (SPAR)

	Model 1	Model 2	Model 3
Under-represented Minorities (base lowest quartile)			
Mid Low (21.7%–48.5%)	−1.81	−1.80	−2.68
	(1.48)	(1.57)	(1.50)
Mid High (35.2%–48.5%)	−4.00***	−3.742**	−4.50**
	(1.55)	(1.71)	(1.82)
Highest (48.7%–90.9%)	−9.22***	−8.38***	−9.58***
	(1.60)	(1.79)	(2.07)
Socio-economic status of Colleges (base highest quartile)			
Lowest (< $50,784)	−5.73**	−6.69**	−7.88**
	(1.67)	(1.69)	(1.73)
Mid Low ($50,784–$62,916)	−2.10	−2.72	−3.59*
	(1.51)	(1.51)	(1.44)
Mid High ($62,916–$81,718)	−1.21	−1.93	−2.68
	(1.46)	(1.51)	(1.46)
Funding			
State	−2.76**	−2.85**	−2.61*
	(0.84)	(1.12)	(1.06)
Local	−0.70	−0.94	−0.72
	(0.73)	(0.81)	(0.76)
Controls			
Student Population Characteristics	No	No	Yes
Institutional Characteristics	No	Yes	Yes
Total	107	107	107

$* \ p < 0.05, ** \ p < 0.01$

Note: Demographic controls include: percent of students receiving Board of Governor's fee waivers, percent female, percent part-time, number of students placed into the lowest levels of remedial math, API scores for feeder high schools. Institutional controls include: location of community college, college size, percent of students in a vocational track.

Source: Data compiled from California Community College Chancellor's Office Management and Information System (MIS) and U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS).

success for all types of students. This study informs this current discussion by conducting an institutional-level analysis of California community colleges, examining how state and local funding, student racial and ethnic composition, and college socio-economic status relate with a college's overall student success.

The findings presented in this paper provide evidence showing that colleges serving larger proportions of underrepresented minority students experience on average worse outcomes on various measures of student success compared with colleges with lower proportions of underrepresented minority students. Specifically, we find that colleges with populations composed of over 35 percent of underrepresented minority students experience significantly lower SPAR rates than colleges with less than 22 percent of underrepresented minorities. While this result is to be expected given that African-American and Latino students on average report lower indices of academic achievement during high school and college, the finding holds true even after we control for two institutional level measures of academic preparation: average Academic Performance Index of feeder high schools, and the number of students in the lowest levels of developmental math. The result suggests there may be harms associated with racial and economic isolation at the community college level, mirroring those found at the elementary and secondary levels.

The findings also suggests that California's higher education system has been unsuccessful in remedying systemic and institutional shortcomings to better respond to the academic and nonacademic needs of colleges serving principally underrepresented minorities. As shown in our bivariate results, the amount of state funding that a community college receives is independent of the percent of underrepresented minority students it enrolls. Although the amount of state aid a community college receives depends on a number of factors, the current funding formula for community colleges does not factor in the types of students (that is, ethnicity or socioeconomic status) a community college enrolls.

In light of our findings, we offer two suggestions that policymakers should consider in order to create meaningful and positive change in colleges serving predominately underrepresented minorities.

Address Socioeconomic and Racial Isolation

First, policymakers should consider ways to remedy the impact of socioeconomic and racial isolation at American community colleges. Creative thinking should address ways to create a more optimal economic and

racial/ethnic mix at both community colleges and four-year colleges. For example, in California, the UC and CSU systems recently increased the quota of out of state and international students enrolled in their colleges. While such action increases revenue for these two systems, it limits the number of spots available to community college transfer students at public four-year institutions. This could have the effect of making community colleges even more racially and economically isolated, as white and middle-class students may avoid two-year institutions because they may have difficulty transferring to a four-year institution. Efforts should be made instead to make community colleges more attractive to a broad cross-section of students, while opening access at four-year colleges to more economically disadvantaged and minority students. Ensuring that community colleges have more voice in discussions about admissions decisions at four-year colleges may also serve to increase success among community college students.

Rethink Current Funding Mechanisms

State and local funding formulas across the country should recognize that more needs to be done to compensate colleges with larger proportions of underrepresented minority and low-income students. To close this gap, the current funding model should consider allocating additional state funding to community colleges serving these types of students, tying such funding with efforts to improve teaching practices and student services. This type of provision would mimic Title I funding in K–12 schools, which serves to improve performance for schools that serve high-need students.[24] Currently, colleges serving over 25 percent of Latino students are classified as Hispanic Serving Institutions (HSIs) and qualify for receiving additional funding. This policy should be continued and ought to incorporate a performance based measure that provides a premium for HSIs as well as other minority student serving institutions that are effective in increasing success and progress rates for under-represented minorities.

NOTES

1. *Education at a Glance 2010* (Paris: Organization for Economic Co-operation and Development, 2010).

2. Paul Skomsvold, Alexandria Walton Radford, and Lutz Berkner, "Six-Year Attainment, Persistence, Transfer, Retention, and Withdrawal Rates of Students Who Began PostsecondaryEducation in 2003–04," (NCES 2011-152), U.S. Department

of Education, Institute of Education Sciences, National Center for Educational Statistics, 2011.

3. Thomas D. Snyder and Sally A. Dillow, *Digest of Education Statistics 2011* (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 2012).

4. Anthony P. Carnevale and Jeff Strohl, "How Increasing College Access Is Increasing Inequality and What To Do about It," in *Rewarding Strivers: Helping Low-Income Students Succeed in College,* ed. Richard D. Kahlenberg (New York: The Century Foundation Press, 2010), 71–201.

5. Donna M. Desrochers and Jane V. Wellman, *Trends in College Spending 1999–2009* (Washington, D.C.: Delta Project on Postsecondary Education Costs, Productivity, and Accountability, 2011), http://www.deltacostproject.org/resources/pdf/Trends2011_Final_090711.pdf.

6. Gary S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Dducation,* 3d. ed. (Chicago: University of Chicago Press, 1994).

7. Eric A. Hanushek, "Assessing the Effects of School Resources on Student Performance: An Update," *Educational Evaluation and Policy Analysis* 19 (1997): 141–64.

8. John S. Coleman et al., *Equality of Educational Opportunity* (Washington, D.C.: U.S. Government Printing Office, 1966).

9. Gary Orfield, *Schools More Separate: Consequences of a Decade of Resegregation* (Cambridge, Mass.: The Civil Rights Project, Harvard University, 2001).

10. SPAR is calculated using the total number of first-time who showed intent to complete. In order to know what proportion of the full time equivalent (FTE) students were represented in the cohort, we used IPEDS to estimate the ratio of the number of first-time full-time degree seeking students to the total number of FTE students. For the 2005 academic year, the California community college system reported a total of 439,053 Fall FTE students enrolled and of those only 71,502 were first-time full-time certificate-seeking students. This means that the cohort represents about 16 percent of the total number of students enrolled in the community colleges. We used IPEDS to calculate this proportion for the years 2005 to 2008 and estimated ranged between 16 percent to 23 percent. This might be a lower bound estimate as we are not taking into account part-time students who showed intent to complete.

11. Legislative Analyst Office, "The 2012–13 Budget: Proposition 98 Education Analysis," February 6, 2012, //www.lao.ca.gov/analysis/2012/education/proposition-98-020612.aspx.

12. Public Policy Institute of California, "California's Community College Students," *California Counts: Population Trends and Profiles* 8, no.2 (November 2006), http://www.ppic.org/content/pubs.cacounts/CC_1106RSCC.pdf.

13. Ibid.

14. Gale Holland, "California's Community Colleges Near the Breaking Point," *Los Angeles Times,* February 3, 2009, articles.latimes.com/2009/feb/03/local/me-transfer3.

15. Patrick Murphy, Max Neiman, and Jelena Hasbrouck, "Exploring Candidates, Elections, Campaigns, and Expenditures in California Community College Districts, 2004–2010," Research and Occasional Paper Series: CSHE11.12, Center for Studies in Higher Education, University of California, Berkeley, October 2012.

16. The ARCC, MIS, and Fiscal Data Abstract are managed by the California Community College Chancellor's Office (CCCCO); IPEDS is published by the U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. CPEC was managed by the State of California (recently eliminated). California Postsecondary Education Commission, "Ethnicity Snapshots," http://www.cpec.ca.gov/StudentData/EthSnapshotGraph.asp (retrieved August 28, 2012).

17. Although 112 community colleges make up the California community college system, longitudinal data on four newly instituted colleges were missing: Coastline Community College, Moorpark College, Moreno Valley College, Norco College, West Hills College Lemoore, and Woodland Community College. Therefore regression analysis could not be conducted on these colleges.

18. Initially we used the Board of Governors Fee Waiver (BOGFW) as a proxy for the socioeconomic status of colleges. In California, a student who belongs to a family of four with an income of less than $33,525 receives a fee waiver. In our analysis, we found a strong correlation between BOGFW and state funding (78 percent). This strong correlation is explained by the fact that colleges in California receive additional funding if their students qualify for this fee waiver. For this reason we decided against using this variable in our analysis in favor of median family income to determine the socioeconomic status of each college.

19. The variable median family income of location is based on 2012 data and calculated by the Aspen Institute. Data on college socioeconomic status were unavailable for previous years.

20. Becker, *Human Capital*.

21. Although we consider this variable the best proxy for academic preparation of entering students, it does suffer several limitations. First, given that community colleges are open access institutions, they cannot use the SAT or other measures to select students so we are unable to use this variable as a control for academic preparation. Second, the meaningfulness of API feeder high schools is limited given that even though a majority of community college students tend to attend two-year colleges in their neighborhoods, some do attend community colleges that are far away from their homes. Given that we did not have access to student's high school transcripts, we considered these two variables to be the best proxies for a student's academic preparation.

22. "Annotated Bibliography: The Impact of School-Based Poverty Concentration on Academic Achievement and Student Outcomes," Poverty and Race Research Action Council, Washington, D.C., http://www.prrac.org/pdf/annotated_bibliography_on_school_poverty_concentration.pdf.

23. Ibid.

24. The state of California is exploring the use of a weighted formula to allocate resources in K–12 (Legislative Analyst Office, "The 2012–13 Budget: Proposition 98 Education Analysis"). Given the similar governance and funding structure of the CCCS to the K–12 system, it would be important to explore whether this type of funding would also result in reductions in educational attainment gaps between URM and white and Asian and Pacific Islanders in community colleges.