Chapter 7
Higher Education Finance in the United States: Sources of Funding and Impacts of State Investments

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Abstract Higher education funding in the U.S. is complex and distributed through multiple funding sources that change over time with important differences across states, public and private institutions, and institution types. This chapter provides an overview of the major sources of funding for U.S. higher education and how they have ebbed and flowed over time. We investigate the potential ramifications of changes in state funding, which has long been the primary source of revenue for public institutions. We find evidence that state appropriations to institutions and student financial aid are directly tied to student outcomes in higher education, with both funding strategies essential to increasing student access and success. We also discuss inequalities in state funding between states, institutions, and student demographics, which contribute to an already highly unequal U.S. economy and educational system. The chapter concludes by discussing the successes and implications of the U.S. approach to funding higher education and the importance of continued public investment in institutions and students.

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Introduction

As in many other countries, higher education finance in the United States (U.S.) is complex and multilayered. Funding for higher education comes from numerous public and private sources and varies significantly across states and institution types. In addition, the relative amounts of funding from each source and institutional reliance on public and private sources has changed considerably over time. In this chapter, we describe these trends; provide a framework to understand the many revenue sources for higher education institutions in the U.S.; and, with an in-depth literature review, analyze the impacts and outcomes of different methods for funding public institutions.

Before entering the discussion of higher education funding sources in the U.S., it is important to understand that not all institutions are funded equally. The U.S. has public, private not-for-profit, and private for-profit postsecondary institutions. There is no national or federal public institution system. Instead, most public institutions are entities of their states, while some are owned by Native American tribes. Each type of institution relies on different funding sources.

Public institutions have historically been primarily funded by state tax appropriations, but state funding has been unsteady in the last few decades and as a result, public institutions are increasingly reliant on other funding sources (Pew Charitable Trusts, 2019). Public institutions on average received just over half of their total educational revenues from state and local governments in 2021, down from 80% in the 1980s (Laderman & Kunkle, 2022). With a few exceptions, public institutions do not receive direct federal appropriations and the bulk of their non-government revenues come from student tuition. Community colleges (which primarily serve their local area and offer sub-baccalaureate credentials) and regional public institutions (which primarily serve their region rather than the state or nation) are the most reliant on state and local funding and receive fewer tuition revenues (McClure, 2018). On the other hand, large public research universities have higher tuition rates and enroll more out-of-state and international students (who pay much higher tuition). They also receive state, federal, and private research funding and are thus less reliant on general appropriations (Ehrenberg, 2006; Hearn et al., 2016). Some prestigious public research institutions also receive significant donations and earn income on their endowments, but this funding source is not equally distributed across institutions. A small number of public institutions are owned by Tribal (Native American) governments rather than state governments and have a different funding structure. In most cases, these Tribal institutions receive no state appropriations and are heavily reliant on federal appropriations, resulting in fewer total revenues than comparable state-owned public institutions (Nelson & Frye, 2016).

At almost all private institutions, the primary revenue source is tuition and fees. Tuition revenue is a mixture of private funding from individuals, government financial aid, and public or private student loans, all of which flow through the student. From an institutional perspective, all tuition revenue serves the same purpose and there is no net revenue effect to the institution based on the source of tuition funds.

Private institutions are also more dependent on private giving and income from endowments.

In the first half of this chapter, we follow the typography used in the previous chapter to provide a framework for higher education funding sources and methods in the U.S. and describe each funding source in detail. Unless otherwise specified, our primary focus is on the funding sources for public institutions, as they serve 75% of all college students in the U.S. and have a more varied funding structure.[1]

The largest source of funding for public higher education institutions in the U.S. is state governments, and the second half of this chapter is concerned with what we know about the impact of each of the two main state higher education funding sources—direct operating support and student financial aid—on student success. We find clear evidence that increased financial resources are directly tied to student success in higher education. We conclude by discussing the implications of the U.S. approach to funding higher education and the importance of continued public investment in institutions and students.

Public Funding in U.S. Higher Education

One of the core beliefs that motivates the general approach to public funding of higher education in the United States is the idea of cost sharing. Within the U.S. context, cost sharing takes the form of spreading the burden of funding higher education between levels of government (federal, state, and local), between direct aid to institutions and direct aid to students and families, and between governments and students (i.e., the tuition and fees they pay). While there remains and consensus that each actor has some level of responsibility for funding higher education, there is little agreement regarding the distribution of the cost sharing. Therefore, these decisions must be renegotiated each year within a contested political space. This leads to significant variation in public funding for higher education between states and over time.

As indicated, public institutions of higher education are primarily publicly funded with appropriations and financial aid from state, federal, and local governments.[2] State and federal governments have longstanding commitments to funding higher education (California State Department of Education, 1960; Hegji, 2017; Pew Charitable Trusts, 2019). However, public funding from states has not kept up with economic inflation and growth in the student population (Laderman & Kunkle, 2022). In this section, we describe the primary methods of public funding for higher education and, for each method, discuss trends over time and across states.

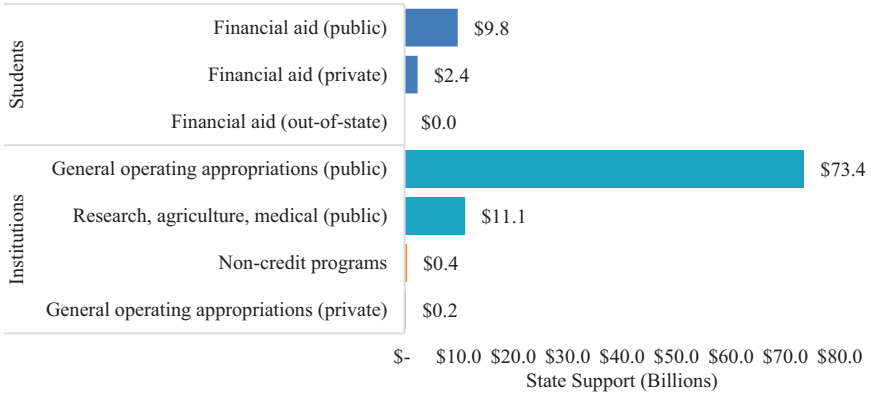
[1] Based on authors' calculation of IPEDS data.

[2] Appropriations go directly to institutions. Financial aid is awarded to students, who apply it to their tuition and fee payments and may use it to cover non-tuition costs.

State Funding

State funding is the largest single source of revenue for the majority of public higher education institutions. State governments spent on average 8.5% of their budgets on higher education in 2021 (NASBO, 2021). States invest in public higher education in two primary ways: through direct funds to institutions (general operating appropriations) and through direct funds to individuals, who can then choose which institution in their state to spend those dollars (student financial aid).[3] Many states also provide a smaller proportion of funding to support research at public universities (Laderman & Kunkle, 2022). Historically, most state spending on higher education has been allocated directly to institutions as general operating appropriations. However, over the last two decades state investments in student financial aid have increased while state support for general operations has fluctuated with the economic cycle (Delaney & Doyle, 2011; Laderman & Kunkle, 2022). As a result, the relative size of these two components of state support has changed over time, with state financial aid as a percent of state support increasing from 4.8% to 11.2% over the last 20 years.[4] Fig. 7.1 shows the distribution of state higher education funding between students and institutions.

There is substantial variation across states in the amount and distribution of state investment in higher education as well as in the degree to which states have



Notes: Public and private refer to institutional control of ownership. Out-of-state refers to institutions, which may be public or private, but are located out of the jurisdiction of the state providing funds.
Source: Authors calculations of SHEEO SHEF data.

Fig. 7.1 State funding for higher education by category (in billions), fiscal year 2021

[3] States vary in the restrictions of state student financial aid. Some states, such as Tennessee and Florida, allow students to use these funds at in-state public or private institutions, whereas other states, such as New York, restrict these funds to in-state public institutions only.

[4] Based on authors' calculation of SHEEO data.

recovered from declines in state funding during the two most recent U.S. recessions (which occurred in 2001 and 2008).[5] Both state general operating appropriations and state financial aid are important factors in financing the education of today's students, but the relative impact of each of these funding sources is not well researched. The latter half of this chapter more closely explores the known impacts of state investments in general operating and financial aid on student access and success.

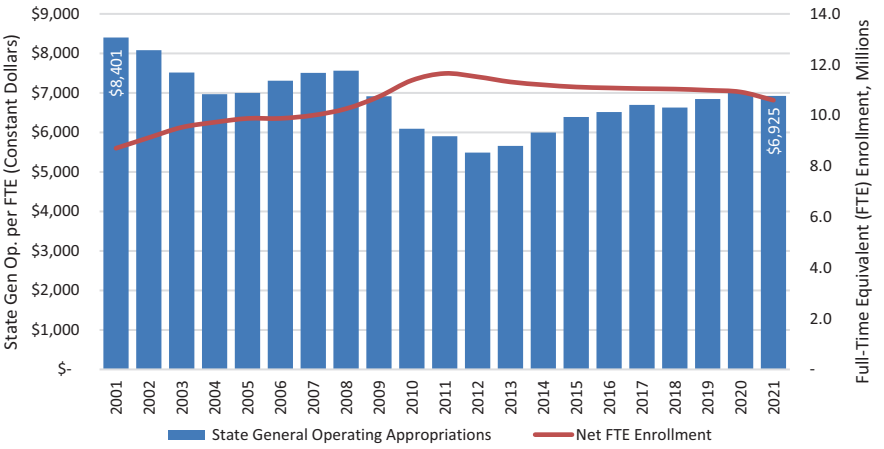
General Operating Appropriations General operating appropriations refer to state-funded tax and non-tax appropriations given directly to public and private institutions for general instruction and operations (not including research). While some types of state support can be earmarked for specific purposes, general operating appropriations are typically considered unrestricted revenue and can be used for any purpose that fulfills an institution's mission (Tahey et al., 2010). Traditionally, general operating appropriations have been used to subsidize the cost of educating state residents, allowing state residents attending public institutions to pay a lower tuition price than an out-of-state student and, in most cases, a lower tuition price than they would pay at a private institution. In most cases, operating appropriations come from the state's general fund, which is funded through state consumption and income tax revenues (NASBO, 2021). In addition to tax appropriations, some states use alternative sources of revenue to fund certain programs. For example, several states earmark a portion of lottery profits for merit-based aid programs (Ness & Mistretta, 2010). In this section, we focus exclusively on public general operating appropriations because private general operating appropriations account for only 0.2% of total state general operating appropriations.[6]

State general operating appropriations for public institutions increased 0.3% in inflation-adjusted dollars from 2001 to 2021. However, the full-time equivalent (FTE) enrollment of students increased 21.7% over that timeframe. This means that on a per-FTE basis, state support for public general operating appropriations has declined 17.6% since 2001 (Fig. 7.2).

The national figures mask considerable variation in general operating appropriations across states. After adjusting for differences in cost of living and the enrollment mix across institution types, state general operating appropriations per FTE in 2021 ranged from less than $3000 in Arizona and Colorado to over $15,000 in Alaska and Wyoming (Fig. 7.3). There are also large differences in state appropriations across institution types. In general, two-year institutions (which primarily award associates degrees and are also called community colleges) receive fewer state appropriations per FTE (Laderman & Kunkle, 2022). However, two-year institutions in the U.S. also receive local appropriations from governments below the state level in 32 states, described in a later section.

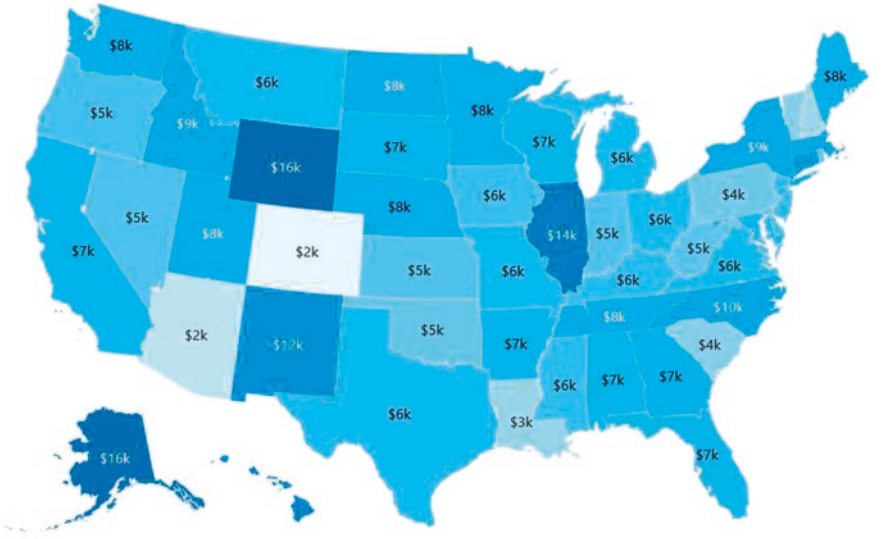
[5] The U.S. entered a short recession in 2020, the long-term impacts of which were not understood at the time of publication.

[6] Based on authors' calculation of SHEEO data.



Notes: Data are adjusted for inflation using the Bureau of Labor Statistics' 2021 CPI-U. FTE enrollment excludes medical students.
Source: Authors calculations of SHEEO SHEF data.

Fig. 7.2 State general operating appropriations and FTE enrollment, 2001–2021 (constant dollars)



Notes: Data adjusted in two ways: (1) SHEEO's Enrollment Mix Index (EMI) adjusts for differences in the distribution of enrollment by sector in each state compared to the national enrollment distribution; and (2) the Cost of Living Index (COLI) is calculated based on the weighted average of county-level data collected by the Council for Community and Economic Research.
Source: Authors calculations of SHEEO SHEF data.

Fig. 7.3 State general operating appropriations per FTE by state, 2021 (adjusted)

Funding Allocation Formulas States allocate general operating appropriations to institutions using several strategies, which have changed over time. Funding formulas were designed to make the appropriations process more predictable and stable by using quantitative data that measured states' share of institutional costs. Over time, formulas became more complex by accounting for differences in institution missions, cost differences between programs, and incorporating analysis of peer institutions (McKeown & Layzell, 1994). The use of funding formulas varies greatly by state. Some states utilize multiple formulas for different functional areas (e.g., instruction, student services, etc.), while other states use relatively simple formulas based on FTE enrollment (SRI International, 2012).

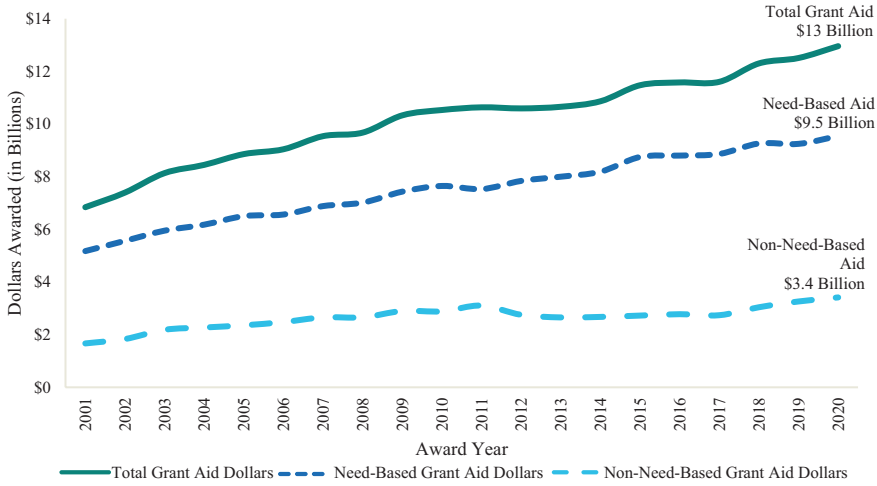
Beginning in 1979 with Tennessee, state policymakers began incorporating performance indicators (such as retention rates and graduation rates) into funding models. This development, commonly known as performance-based funding (PBF), has gone through multiple iterations and waves of adoption (Dougherty & Natow, 2015). As of 2020, at least 30 states were implementing an OBF model (Rosinger et al., 2020). Research on the newest models suggests that they may exacerbate equity gaps if formulas do not incorporate metrics to prioritize the success of underrepresented students (Gándara & Rutherford, 2017).[7]

State Student Financial Aid Subsidies provided directly to students to then use at their college of choice are known as student financial aid. Many state financial aid programs began in the 1970s when the federal government offered matching funds to states for providing student financial aid (Heller, 2011).[8] These programs were primarily targeted to financially needy students, but, in recent years, non-need-based programs have proliferated (Doyle, 2006). Many of these programs are referred to as merit-based student grant aid programs and often require students meet a grade point average or admissions test score threshold to be eligible. Historically, state grant aid has been less vulnerable to economic recessions than general operating support (Laderman & Kunkle, 2022). In stark contrast to the cyclical trends that characterize the general operating appropriations funding patterns presented above, state support for student grant aid consistently increased during the 2000s. From 2001 to 2020, need-based grant aid increased 84.5%, while non-need-based grant aid increased by 105% (Fig. 7.4).

State Research Appropriations In addition to state funding for general institutional operations and student financial aid, states also provide funding for research, agricultural stations, and medical or hospital appropriations to some public institu-

[7] The U.S. continues to struggle to broaden access and success in higher education to the groups who have been historically underrepresented and excluded from higher education, particularly students who identify as American Indian, Alaska Native, Black, Latinx, Native Hawaiian, and Pacific Islander, or come from low-income households.

[8] The major need-based state financial aid programs no longer have a federal matching component, though the State Student Incentive Grant has morphed into the Leveraging Educational Assistance Partnership (LEAP) grant program (Federal Student Aid, 2021).



Notes:
1. State grant aid includes all scholarship and grant aid awarded to undergraduate and graduate students, including the small portion of aid allocated to non-public institutions.
2. Data are adjusted for inflation using the Bureau of Labor Statistics' 2021 CPI-U, indexed to 2020.

Source: National Association of State Student Grant and Aid Programs.

Fig. 7.4 State grant aid for need- and non-need programs, U.S., 2001–2020 (constant dollars)

tions. Research funding is generally allocated to public research institutions; agricultural funding is allocated to institutions specifically designated by the government as "land-grant" institutions (APLU, n.d.); and medical and hospital funding is allocated to universities with a medical school or hospital (Laderman & Kunkle, 2022). Over time, these research, agricultural, and medical appropriations (including medical schools and hospitals) have declined as a proportion of total state higher education funding and in inflation-adjusted dollars.

Primary Predictors of State Funding The variation between states in in state general operating appropriations for higher education brings up natural questions regarding the determining factors for levels of state support. Research on state higher education funding has identified several demographic, economic, and political factors that affect state support. Among these three categories, state economic conditions and the availability of tax revenue are the most significant predictors. Periods of declining tax revenue are particularly detrimental for higher education funding due to balanced budget requirements that prevent states from operating deficits. These requirements require states to reduce expenditures when tax revenues do not adequately cover current spending (Hou & Smith, 2006; Poterba, 1994). Higher education funding is often a primary target of policymakers cutting budgets to meet balanced budget requirements because higher education is generally viewed as the most discretionary budget item (Hovey, 1999; Okunade, 2004). This makes higher education susceptible to being crowded out by increases in demand for other budget categories such as healthcare and corrections (Kane et al., 2003; Weerts & Ronca, 2012).

Political factors also impact funding decisions. Republican party control of state executive and legislative branches is associated with lower levels of state support for higher education, while the capacity of a state's legislative body has been consistently associated with increased state support (McLendon et al., 2009; Tandberg & Griffith, 2013). Interest groups and governance structures can play a role in appropriations decisions. A larger ratio of higher education groups relative to all registered interest groups is associated with increased state support for higher education, while strong state-level governing boards are associated with decreased state support (Tandberg, 2010a, b).

Federal Funding

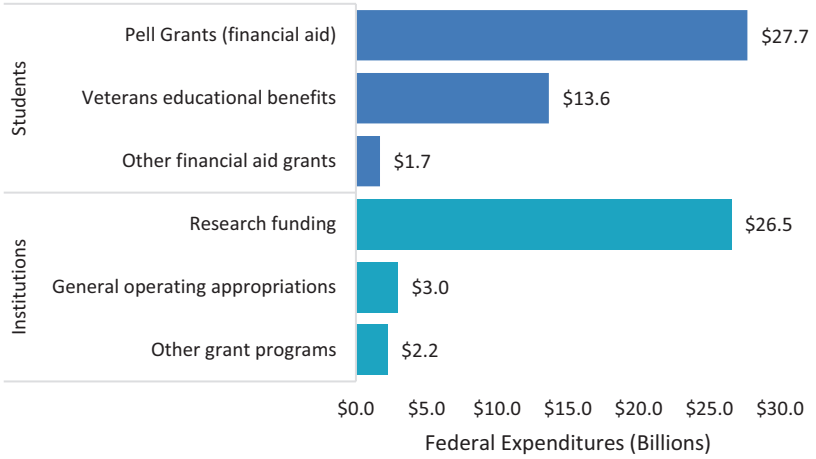
The federal government spends about 2% of its total expenditures on higher education, primarily through student financial aid and competitive research grants (Pew Charitable Trusts, 2019).[9] In contrast to state funding for higher education, only a small portion of federal funding is appropriated directly to higher education institutions. In addition to these areas, the federal government also provides significant aid to those students who served in the U.S. military in the form of veterans' benefits (Fig. 7.5). Over time, federal investments in higher education have increased in both absolute and relative terms (Pew Charitable Trusts, 2019). In this section, we outline the ways in which the U.S. federal government supports public and private higher education institutions.

General Operating Appropriations Since the passing of the Higher Education Act in 1965, the federal government has provided funding to Historically Black Colleges and Universities (HBCUs) and Tribally Controlled Colleges and Universities (TCCUs).[10] The federal government also provides support to two federally charted private institutions located in Washington, D.C. Finally, the federal government funds the U.S. military academies.

HBCUs are colleges and universities established prior to 1964 with the primary mission and purpose of educating Black students (Williams & Davis, 2019). Unlike non-HBCUs, these institutions receive direct appropriations from the federal government in recognition of their contributions to promoting equal opportunity and to correct decades of discriminatory practices by the federal government (Williams & Davis, 2019). TCCUs are chartered by sovereign Indian nations with the specific purpose of providing higher education to American Indians (Hegji, 2017). Notably,

[9] Excluding loans and tax credits.

[10] The U.S. federal government provides similar funding to a broader group of minority-serving institutions (MSIs), which are designated based on enrollment demographics and apply for competitive grant awards. These institutions are not discussed in this section because their competitive, term-based grants differ substantially from the annual, noncompetitive, formula-based awards to HBCUs and TCCUs (Hegji, 2017).



Notes: Includes funding for public and private institutions. Does not include student loans or tax credits.
Source: Adapted from Pew Charitable Trusts, 2019.

Fig. 7.5 Federal funding for higher education by category (in billions), 2017

with very few exceptions, TCCUs do not receive state or local appropriations and are, as a result, heavily reliant on federal appropriations (Nelson & Frye, 2016).

Federal Research Funding Most institutional federal higher education funding is in the form of research grants and contracts (Fig. 7.5). Federal research dollars are allocated on a competitive basis, and institutional researchers apply to receive funding for specific research projects (Pew Charitable Trusts, 2019). Federal research expenditures at higher education institutions have increased greatly over time, growing 60.5% from 2001 to 2019 (National Science Foundation, 2020). The federal government is the largest funder of higher education research in the U.S., accounting for about 71% of external research funding in 2019 (National Science Foundation, 2020).

Federal Student Financial Aid Title IV of the Higher Education Act of 1965 led to the creation of the primary federal student financial aid programs that remain today: work-study, need-based grant aid, and federal loans. Though these programs have been altered numerous times since their inception, they maintain the same intent: to equalize opportunity and access to postsecondary institutions (Mumper et al., 2011). Eligibility for these programs is portable, and students may use their awards at any of the approximately 6000 Title IV-eligible colleges and universities, including public, private non-profit, and private for-profit institutions. A discussion of the two largest types of aid (Pell grants and federal student loans) follows.

Pell Grants The federal Pell Grant is a means-tested grant aid program that serves more undergraduates than any other grant aid program in the United States. The maximum award for the program in 2022–23 is $6895, with students with greater

financial resources or who attend part-time receiving a lesser amount (Federal Student Aid, 2022). Though the Pell Grant is generous in the number of students it serves, the maximum award has not kept pace with increases in college prices.

Federal Student Loans Student loans have received considerable attention in the U.S. in recent years with some calling for outstanding student debt obligations to be forgiven (Looney et al., 2020). According to the most recent data, outstanding student loan debt topped $1.5 trillion in the third quarter of 2020 (New York Federal Reserve, 2020). There are several federal loan programs, including programs for undergraduates with no credit requirements (Direct Loans), programs for graduate students (Graduate PLUS Loans), and programs designed for the parents of undergraduates (Parent PLUS Loans). Importantly, debt burdens include money borrowed for both tuition and fees, and education-related cost-of-living expenses. As can likely be gleaned by this brief description, the federal student loan programs serve a diverse set of postsecondary finance needs.

Tax Benefits The federal government also provides federal tax relief to students and their families through higher education tax benefits. Federal tax credits reduce the amount of money an individual owes to the federal government (Bartel, 2020). Education tax credits can be seen as a partial refund for money spent on higher education and were originally targeted toward middle-income earners who did not qualify for federal need-based aid (such as Pell grants). In 2017, 8.7 million tax credits were awarded (Internal Revenue Service, 2020). Total federal spending on higher education tax benefits has increased consistently over time (Pew Charitable Trusts, 2019).

Primary Predictors of Federal Funding There are several influential actors affecting the federal funding of higher education in intentional and unintentional ways. The history of sweeping changes in federal higher education policy are marked by presidential administrations attempting to make significant societal changes, like the 1944 Servicemen's Readjustment Act (e.g., GI Bill), the 1958 National Defense Education Act, and the 1965 Higher Education Act. As monumental as these changes to the federal higher education landscape were, the subsequent political environment and funding efforts have been characterized by a lack of fundamental change (Hearn, 2001). Instead of overhauling or consolidating programs, Congress and presidential administrations have instead chosen to tweak existing programs. These decisions, or lack thereof, have the ultimate consequence allowing established policies to drift along without intention (Hearn, 2001).

The higher education lobby in Washington, D.C., has been dominated by the activities of six associations of university presidents. The lobbying efforts of the presidential associations are most evident around the funding of federal student financial aid programs, where their political activities have been criticized for spending too much time on consensus-building (rather than direct lobbying), for not supporting friendly candidates through campaigning or fund-raising, poor

relationship building with elected officials and their staffs, and for having somewhat disorganized and less than effective advocacy efforts (Cook, 1998; Parsons, 2004; Wolanin, 1998). While there are numerous other higher education associations, the "big six" associations of university presidents are the most important and influential higher education interest groups at the federal level (Cook, 1998).

Local Funding

In 32 states, local governments provide tax appropriations to public higher education institutions (Laderman & Kunkle, 2022). Local appropriations are primarily used for two-year institutions but in some states a small amount may also go to four-year institutions. Since 1980 (the earliest data available), inflation-adjusted local appropriations have increased steadily over time. This increase is not explained by a relative increase in two-year enrollment; in fact, most of the enrollment growth since 1980 has occurred at four-year institutions.[11]

Private Funding in U.S. Higher Education

The majority of private funding for U.S. higher education comes from student tuition and fees (which may be financed through student loans). In addition, institutions receive private gifts and donations from individuals and organizations, including those designated for research, but those revenues make up a very small portion of most institution's total revenues (Pew Charitable Trusts, 2019). For this reason and because tuition and fees are an increasingly important revenue source for U.S. higher education, we focus our discussion of private revenues on student tuition and fees.

Tuition and Fees

The primary source of private funding for U.S. higher education at public and private colleges and universities is student tuition and fees which is the sum of all student tuition and fee payments. Tuition rates vary by student type. At public institutions, tuition rates depend on student residency (students attending college in their state of residency have much lower tuition), degree program, student level, institution type (with community colleges charging the lowest tuition and research universities the highest), and the level of state funding an institution receives (Ma &

[11] Based on authors' calculation of IPEDS data.

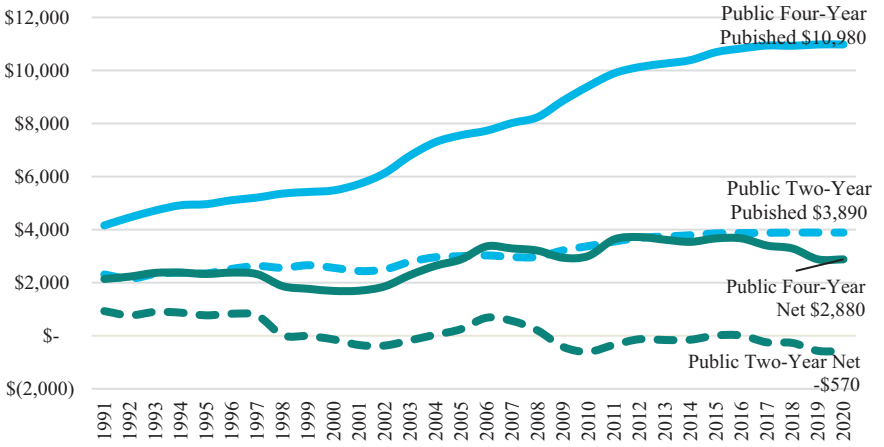
Pender, 2021). Most institutions discount their tuition for certain students or student groups using tuition waivers and scholarships or other financial aid. Fees also vary substantially and can be required of all students or can be program or course specific. Over time, tuition rates in the U.S. have increased faster than inflation, and institutions have increased their discounts and waivers, resulting in increasingly differentiated prices for the students at a given institution (NACUBO, 2022).

At public institutions, tuition rates are impacted by the political process and, in some cases, are subject to state approval. In many states, tuition rates for undergraduate in-state students are controlled by a state board or government (Armstrong et al., 2017). In response to concerns about the rising cost of college, states have increasingly limited or frozen tuition rate increases. However, few states control fees. Fees vary from technology and athletic charges to library fines and online course surcharges. Fees have generally not been controlled by state governments and in some states, fees have increased considerably to make up for declines in state funding and tuition rates that are frozen or limited (Kelchen, 2016).

Trends in Tuition Rates For several decades, the price of college in the U.S. has increased at a rate far beyond inflation. However, there is an important difference between the often-publicized rise in published tuition rates and what students actually pay. All public and private institutions publish tuition and fee rates for a given academic year (the sticker price), but these prices often do not reflect the average tuition and fees students are charged (the net price). The difference is due to financial aid and scholarships from federal, state, local, institutional, and private sources. At two-year public institutions, inflation-adjusted student net price decreased 161% from 1992 to 2021. At four-year public institutions, the net price increased 35% beyond inflation (Fig. 7.6).

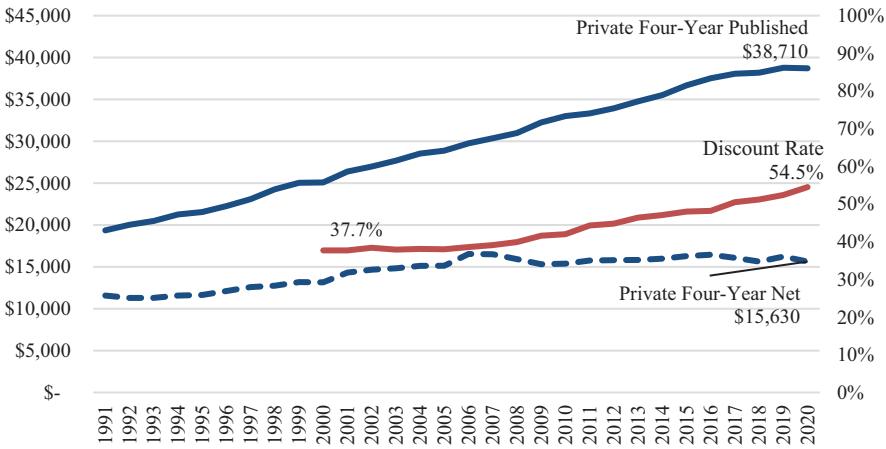
Private institutions have higher tuition rates because they are not subsidized by state and local government appropriations. We focus here on private four-year institutions due to better data availability. From 1992 to 2021, inflation-adjusted net price increased 35% at private four-year institutions (Fig. 7.7). In large part, increase to the net price at private institutions have been metered due to increases in institutional financial aid. The percent of first-time full-time students receiving institutional aid at private institutions increased from 37.7% in 2001 to 54.5% in 2021. This means that private not-for-profit institutions discounted, on average, more than half of their advertised tuition rate (NACUBO, 2022).

Trends in Tuition and Fee Revenues The tuition rates described in this section impact the total tuition revenue received by an institution. However, total tuition and fee revenue is also affected by changes in the mix of students attending an institution. In general, tuition rates at public institutions are lowest for students seeking associates degrees (a two-year degree), higher for those seeking a baccalaureate degree (a four-year degree), and highest for those seeking a graduate degree like a masters or a doctorate. At public institutions, state residents pay greatly subsidized tuition rates and contribute less per-FTE to an institution's total tuition revenue than out-of-state or international students. Tuition revenues at public institutions have grown consider-



Notes: For full-time, in-state undergraduate students. Published tuition is average undergraduate in-state tuition and fees. Net tuition is the average tuition and fees after applying federal, state, and institutional grants. Beginning in 2006-2007, net price is for first-time students only. Data are adjusted for inflation using the Bureau of Labor Statistics' 2021 CPI-U.
Source: College Board, Trends in College Pricing and Student Aid 2021.

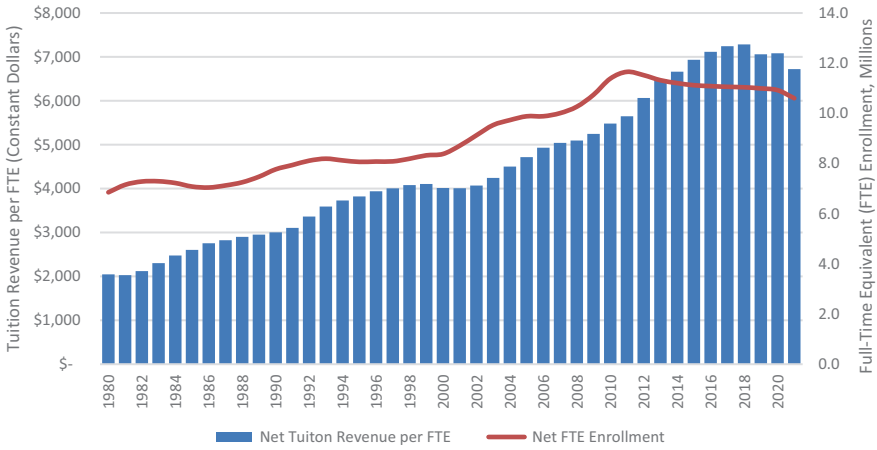
Fig. 7.6 Published and net tuition rates at two-year and four-year public institutions, academic years 1991–1992 to 2020–2021 (constant dollars)



Notes: Tuition rates are for full-time undergraduate students, discount rate is first-time full-time only. Sticker price is the average institution's published undergraduate tuition and fees. Net price is the average institution's tuition and fees charged after applying federal, state, and institutional grants. Beginning in 2006-2007, net price is for first-time students only. Discount rate is the

Fig. 7.7 Sticker price, net tuition, and discount rate at four-year private not-for-profit institutions, academic years 1991–1992 to 2020–2021 (constant dollars)

ably over time due to increases in tuition rates and a move toward increasing out-of-state and international enrollments who pay much higher tuition. However, inflation-adjusted tuition revenues per FTE began to decline in 2019 due to minimal



Notes: Full-time equivalent enrollment converts student credit hours to full-time, academic year students, but excludes medical students. Tuition revenue includes all tuition and fees, net of state and institutional financial aid, institutional tuition waivers or discounts, and medical student tuition and fees. Federal financial aid is included in the tuition data presented here. Data are adjusted for inflation using the Bureau of Labor Statistics' CPI-U for 2021.
Source: Authors calculations of SHEEO SHEF data.

Fig. 7.8 Tuition revenues and FTE enrollment at public institutions, 1980–2021 (constant dollars)

tuition rate increases and growth in student financial aid. Since 1980, annual inflation-adjusted tuition revenue per FTE enrollment has increased 229% (Fig. 7.8).

Variation Across States and Regions At public institutions, private revenues (tuition dollars) are collected in conjunction with the public revenues that subsidize higher education. In general, there is wide variation across the U.S. in the extent to which public institutions are subsidized by the state (Laderman, 2020). In the West, there are (with some exceptions) higher levels of state support and relatively low tuition revenues. In the Northeast and Midwest, state support tends to be low and tuition high leading to a high reliance on student tuition dollars. The South has lower state support and lower tuition revenues, meaning that institutions in those states have lower total revenues than the rest of the country (Laderman, 2020).

Changing trends and the variety of funding sources lead to questions about the efficacy and efficiency of the primary funding strategies. For example, what are the impacts of direct state general operating appropriations to institutions and of state student financial aid on student outcomes? Given the scope of the funding and their potential importance in addressing persistent problems in higher education such inequality, equity gaps, low graduation rates, and a rapidly changing economy, we make these funding sources the focus of the remainder of this chapter. In what follows, we analyze the most current and rigorous research to identify the relationship between state funding for higher education, state student financial aid, and critical postsecondary outcomes.

Impacts of State Higher Education Appropriations and Financial Aid

Questions about the unique impacts of state appropriations and financial aid on desired outcomes have circulated for decades. The effort to determine the ideal structure of public funding for higher education is not new but has shifted focus in the face of an overall declining reliance on state support for public institutional revenues. In the late 1960s and into the 1970s, researchers and policymakers in the U.S. were concerned that using state dollars to broadly fund higher education was regressive, as students from higher income families still disproportionately attended college, and families across the income spectrum funded state subsidies (Hansen & Weisbrod, 1969; Peltzman, 1973). In the 1980s, the choice between general operating appropriations and state financial aid was framed as a debate between two schools of thought; those who believed higher education provided public benefits and should be funded through general operating appropriations to institutions, and those who argued that higher education had private benefits as well, and therefore students should share the burden of its funding (Hearn & Longanecker, 1985). Advocates of the two funding models discussed theoretical economic trade-offs, but little evidence existed on the extent to which the funding structure mattered for states and students (Hossler et al., 1997).

Empirical interest in the trade-offs between allocating state funding to institutions versus students waned in the early 2000s as state funding began to decline (Laderman & Kunkle, 2022). Tuition rates and revenues increased in response, and the attention of many researchers and advocates turned to these concerns. Much of the research reviewed in the following sections of this chapter focused exclusively on either appropriations or grant aid rather than discussing the relative advantages of each.

In this section, we describe the most rigorous existing research on the effects of state appropriations and student grant aid. We begin with the state appropriation findings, outlining the impacts of state appropriations on institutions and students. We then turn to state grant aid, where we discuss the effects of grant aid on enrollment, persistence, and completion, followed by a discussion of the comparative effects of each funding strategy on student outcomes. We end this section with a summary of findings, wherein we provide a high-level overview and discuss the main takeaways from this section.

Methodology

We conducted systematic literature reviews of prior research on state general operating appropriations and state financial aid. We began with foundational studies identified by each author, and expanded our search based on the references found in those studies and keyword searches in multiple databases. Since the empirical research on state appropriations is much less developed than the literature estimating the effects of grant aid, we employ separate inclusion criteria and foci of the two literature review sections.

For state appropriations, studies which examined the change in state appropriations on institutional or student outcomes and used a rigorous quantitative design (e.g., difference-in differences, instrumental variables estimation, fixed or random effects) were included. The state financial aid literature is more developed, and we were able to narrow our inclusion criteria to studies that utilized a quasi-experimental or experimental research design, in addition to a few summary articles. Across both sets of literature, we limited to articles published within the last decade. Eleven state appropriation articles met our criteria, compared to 40 state financial aid articles. Many articles that did not meet our time or rigor criteria were used for background.

Findings

Effects of State Appropriations

There are two main ways that public institutions respond to declining state appropriations—by raising tuition revenues or by decreasing institutional expenditures. Here we review the recent literature related to both mechanisms. A summary of our findings on the effects of state appropriations can be found in Appendix A (Table 7.A1).

Institution Outcomes: Changes in Tuition State appropriations are inversely related to tuition prices at public four-year institutions. A 10% reduction in overall state funding at public four-year institutions leads to a 1.1% increase in enrollment-weighted tuition and a 0.7% increase in published tuition price (Goodman & Volz, 2020). A $1 decline in state appropriations per FTE leads to in-state tuition rate increases ranging from $0.11 at Master's institutions to $0.44 at Bachelor's institutions (Zhao, 2018).[12] The relationship between state funding cuts and higher tuition and fees has increased over time (Webber, 2017). In recent years, a $1000 reduction in per FTE state appropriations would result in the average student paying an additional $412 in tuition. Changes in tuition revenues may manifest as changes in the price that students must pay to attend college or as a shift in institutional priorities toward enrolling more high-paying students (e.g., out-of-state students, higher-income students). The literature is mixed on whether cuts in state funding impact community college tuition (Goodman & Volz, 2020; Zhao, 2018).

Institution Outcomes: Changes in Institutional Expenditures Institutions that are unable to raise tuition and fee revenue to the extent necessary to offset state funding declines respond to cuts by decreasing expenditures.[13] Declines in state

[12] In the United States, institutions are classified based on their highest level of degree offered. Two-year institutions, commonly called community colleges, award primarily associates degrees and certificates; four-year institutions all award baccalaureate degrees and are further classified by whether they offer master's degrees ("master's institutions") or doctoral degrees and engage in substantial research.

[13] When state appropriations decline, institutions respond to the loss in total revenue by increasing alternative revenue sources (such as tuition revenue) or by decreasing total expenditures.

appropriations negatively affect almost all expenditure categories, with the largest impact on spending for direct educational costs including instruction, academic support, and student services (Deming & Walters, 2018; Goodman & Volz, 2020; Zhao, 2018). The extent to which institutions rely on making spending cuts, as well as the types of cuts made, varies between institution types. Community colleges experience the largest impacts (Zhao, 2018).

Student Outcomes: Enrollments Changes in state appropriations are positively related to student enrollment outcomes at both the state and institution level. At the state level, a $1000 increase in state funding per recent high school graduate is associated with a 5.5 percentage point (pp) increase in public postsecondary enrollment per potential college student (Trostel, 2012). Decreases in state appropriations diverts students from the public to the for-profit sector (Goodman & Volz, 2020), with a 10% drop in appropriations leading to a 3% decrease in enrollments at public colleges. This shift is concerning due to evidence from other studies suggesting less favorable labor market outcomes for students who graduate from for-profit institutions (Cellini & Chaudhary, 2014; Deming et al., 2016).

At the institutional level, Deming and Walters (2018) find that a 10% increase in total institutional spending leads to a 3.3% increase in fall enrollment and an 8–8.5% increase in enrollment in each of the following three years. Bound et al. (2019) find that a 10% drop in appropriations leads to a 1.7% and 1.5% decrease in in-state undergraduate enrollment at research and non-research universities (respectively). A key mission of public postsecondary institutions is to educate residents of the state. However, declining state appropriations can lead institutions to stray from this part of their mission and seek out out-of-state students who contribute more tuition revenue to replace lost funding (Jaquette & Curs, 2015).

Student Outcomes: Graduation Rates and Completions The research overwhelmingly finds evidence that cutting state appropriations leads to reductions in graduation rates and the number of degrees awarded.[14] For example, a 10% increase in state appropriations per FTE at four-year public institutions is associated with an approximately 0.64 pp. increase in graduation rates (Zhang, 2009); a 10% increase in per-capita state appropriations is associated with a 3% increase in overall state bachelor's degree production (Titus, 2009); and a 10% increase in state appropriations increases community college completions by 14.5% and bachelor's completions by 4.5% in the years following the increase (Deming & Walters, 2018).

Exploring the heterogeneity in this relationship, Bound et al. (2019) find that at public research universities, a 10% decrease in state appropriations per FTE leads to a 3.6% drop in bachelor's degree attainment and a 7.2% decrease in doctoral attainment. Zhao (2018) finds that the most detrimental impacts are at community

Reductions in state support lead to reductions in institutional spending, which impacts student outcomes. Total revenue is not held constant in such studies.

[14] Graduation rates measure the proportion of full-time students in a cohort who complete their degree in a certain time frame (e.g., bachelors in 4 years). Completions measures the total number of degrees awarded in a given time period.

colleges, where a one standard deviation decrease in state appropriations per FTE ($2962) resulted in a 1.68 per 100 FTE reduction in degrees. This impact may be because community colleges are unable to increase their tuition, and instead respond to state appropriation cuts by reducing expenditures. This is supported by Deming and Walters (2018), who find evidence that the effect of state appropriation changes on total awards is driven by changes in expenditures. Chakrabarti et al. (2020) estimate the effects of a change in state appropriations *while a student is enrolled in college* and find that a $1000 increase per FTE increases the likelihood of earning a bachelor's degree by age 25 by 1.5 pp., and increases the likelihood of community college students transferring and earning a bachelor's degree by age 25 by 3.9 pp.[15]

Inequalities in State Appropriation Funding The research presented here suggests that changes in state appropriations have substantial impacts on institutional and student outcomes at the national level, but these analyses mask the wide variation between states in funding levels and the extent to which public institutions depend on state funding. Likewise, institutional responses to cuts in state funding differ between institution types. Public four-year institutions receive more state funding, yet simultaneously have far greater ability to replace some lost state dollars through tuition increases (Webber, 2017; Zhao, 2018). Community colleges receive less state funding and respond to cuts by reducing institutional expenditures (Chakrabarti et al., 2020; Zhao, 2018).

Inequality in funding across institution types, and the disparate impacts of funding changes, are particularly concerning because students of color disproportionately attend institutions with fewer resources (Ahlman, 2019). From 2006 through 2016, underrepresented students of color (defined as American Indian/Alaska Native, Black, Latinx, and Native Hawaiian or Other Pacific Islander) made up an increasing proportion of enrollment at all public institutions, but were disproportionately likely to attend community colleges—the public colleges with the fewest resources. Universities with the most revenue disproportionately educate the most advantaged (full-time, white, affluent) students (Mugglestone et al., 2019). These patterns suggest that the funding disparities between institution types may not only be unequal, but inequitable as well, as states increase the existing advantages of affluent white students and provide the most resources to institutions that need them the least.

Effects of Financial Aid

Unlike general operating appropriations for institutions, financial aid is awarded directly to students and can directly target particular populations. Student grant aid can be awarded based on financial need, academic merit, some combination of the two, or to

[15] In their exploration into the mechanisms at play, Chakrabarti et al. find evidence that four-year institutions respond to increases in state appropriations by decreasing tuition but do not alter their institution spending on instruction, student services, or academic support. The authors find that two-year institutions respond to increases in state appropriations with price and quality responses, both decreasing tuition and increasing institutional spending.

entire student subpopulations. We review the impacts of state grant aid programs and include evaluations of federal, local, and funded programs when we believe they provide important context. A summary of our findings can be found in Appendix A (Table 7.A2).

Student Enrollment The research on the effects of state grant aid on enrollment outcomes are mixed. Early research on merit-based programs found significant overall enrollment effects using aggregated data, with sizable increases in college-going amongst recent high school graduates (Cornwell et al., 2006; Dynarski, 2004). More recent research, often relying upon state administrative data and regression discontinuity research designs, complicates these earlier findings, suggesting state grant aid has no discernable impact on overall college-going (Bruce & Carruthers, 2014; Gurantz & Odle, 2020). However, promise programs, which advertise free college tuition to a subpopulation, can have substantial impact on initial college enrollment (Carruthers & Fox, 2016; Nguyen, 2020). Gurantz (2019b) finds that college-going increased substantially in year two of a statewide promise program. One of the primary purposes of state merit grant aid programs is to retain talent by keeping high-achieving students in-state to boost the state economy, and these programs are largely successful at incentivizing students to enroll in their home states (Cornwell et al., 2006; Sjoquist & Winters, 2016; Zhang & Ness, 2010).

Grant aid can also impact the type of institution a student attends. Many studies suggest flexible grant aid often moves students, especially academically marginal and low-income students, from two-year institutions into four-year institutions with better outcomes (Bartik et al., 2021; Toutkoushian et al., 2015). Moreover, when grant aid is limited to public institutions, enrollment shifts to public institutions (Cohodes & Goodman, 2014). When state aid can be used at both private and public institutions, some evidence suggests that students may attend a higher cost institution (Bettinger et al., 2019; Gurantz, 2019a).

Student Persistence Persistence refers to the proportion of students who remain enrolled at any institution from year to year. The most rigorous recent evidence suggests that receiving student grant aid strongly impacts student persistence (Angrist et al., 2020; Castleman & Long, 2016; Scott-Clayton, 2011), though these findings are not consistent across all contexts, including the two-year sector (Anderson & Goldrick-Rab, 2018; Carruthers & Welch, 2020).

Student Completion The research examining the effects of financial aid on student completion is mixed, with most studies finding positive or null effects. In their recently published metanalytic review of this literature, Nguyen et al. (2019) estimate that for every $1000 dollars of grant aid, degree completion increases approximately 2.5 pp. The average effect is large, but it does mask some heterogeneity across program designs and aims. For example, studies on the impact of merit aid on completion find no effect (Gurantz & Odle, 2020; Sjoquist & Winters, 2015), and, in rare cases, may reduce a student's likelihood of success (Cohodes & Goodman, 2014). Recent evaluations of hybrid need-based and merit-based aid programs have found positive impacts on completion, primarily driven by low-income and underrepresented racial groups (Bettinger et al., 2019; Page & Scott-Clayton, 2016).

Comparative Impacts of Appropriations and Financial Aid

State appropriations and financial aid likely work together to improve student outcomes, but it is difficult to compare their relative impacts. Still, several studies have attempted to evaluate the effects of both funding sources on institutional and student outcomes. Toutkoushian and Hillman (2012) found that increasing both appropriations and merit-based grants was associated with increased college-going rates, but increases in merit-based aid had a much larger effect. Similarly, Toutkoushian and Shafiq (2009) found that need-based aid is the most financially efficient way to increase enrollment because it increases low-income enrollment but does not decrease other student enrollment. However, they argue state appropriations may be less politically volatile and can help drive state priorities for higher education. On the completion side, Avery et al. (2019) simulated the effects of several funding policies on bachelor's degree completions and found that both tuition and fee cuts and increases in state appropriations to increase institutional spending had positive effects across groups and sectors.

Summary of Findings

The studies reviewed here present important evidence regarding the impacts of funding decisions made by states. State funding has important impacts on enrollment and completion that must be considered. Funding increases are positively related to student enrollment, while appropriation declines lead to increases in out-of-state enrollment, decreasing the share of low-income students and students of color, especially at the most prestigious universities. Changes in state appropriations also positively impact graduation rates, the number of credentials awarded, and statewide degree attainment.

However, the effects of state appropriations differ by sector and by an institution's reliance on state support. Over time, institutions have increased tuition revenues and decreased expenditures in response to declining per-student state appropriations, but different institution types vary in their ability to adopt each strategy, leading to tangible differences in student outcomes. Public four-year non-research institutions and community colleges experience the most detrimental cuts to institutional expenditures because of declining state appropriations, negatively affecting enrollment and completion outcomes. These differences in institutional responses to declining state appropriations exacerbate existing inequalities, wherein the institutions that struggle to increase alternative revenues in response to declining state support also have lower levels of per-student appropriations.

State financial aid studies examining the enrollment effects merit aid find mixed effects, showing increased enrollment when using aggregated state-level data, and no effects when using individual-level data. However, grant aid has been shown to change where a student chooses to enroll, with merit aid increasing the likelihood of recipients remaining in their home state, promise programs increasing enrollment at

eligible institutions, and programs exclusive to public institutions shifting students to the public sector. Grant aid is also positively related to persistence, and there is strong evidence supporting the notion that grant aid positively impacts completion for low-income students and students of color.

Any comparison of the effects of appropriations versus financial aid should consider that the different funding sources have varied intents and objectives. Not all public funding for higher education is intended to increase enrollment and completion for all students. For example, states may choose to target programs that increase enrollment for the lowest-income students (through need-based aid) or may be interested in retaining students who are likely to leave the state for college (through merit-based aid). Given the complexity of the U.S. higher education system, a combination of direct institutional support and financial aid to students will continue to be necessary. Such investments are essential to increasing student access and success.

Discussion

The U.S. approach to funding higher education has not grown from any common strategy or singular set of goals. Instead, multiple actors have and continue to play a role and accept some responsibility, each operating with their own goals and a vague shared understanding of the purposes of higher education. This disparate approach to financing such a critical industry has inherent risks and weaknesses. Most notably, it has allowed for persistent and significant inequalities to exist between states, institutions, and student demographics. These inequalities are not only inefficient but, more importantly, are unfair and unjust; introducing another layer of structural inequality into an already highly unequal U.S. economy and educational system.

That said, the U.S. approach to funding its colleges and universities has also achieved tremendous success. By most accounts it was the first country to massify its higher education "system", reaching far higher enrollment and attainment rates far faster than any other country (Gumport et al., 1997; Guri-Rosenblit et al., 2007). Likewise, its research universities have produced major advances in science, technology, arts, and culture, fueling the economy and improving the quality of life and standard of living in the U.S.

However, such advantages are beginning to wane. Other countries are making major investments in their higher education systems and have now matched or exceeded the U.S. in their educational attainment rates (OECD, 2020). Attainment rates in the U.S. have largely flatlined for decades as the U.S. continues to struggle to broaden access to higher education to students who have been historically underrepresented. A significant barrier to the U.S. improving educational attainment rates is its complex and high-cost approach to financing higher education.

The U.S. approach to higher education finance has given primacy to the states. The states have provided significant direct funding to public institutions with the belief that a robust system of public institutions advances the state's interest in having an

educated citizenry and a strong and vibrant economy. Such funding has lowered the cost to attend college for students and provided flexible funding to institutions to advance their missions. However, this financial and social contract has been frayed as states have disinvested in higher education. Although states seek to expand postsecondary access, as demonstrated by many states having established goals to increase statewide educational attainment rates, this is not always reflected in states' higher education funding behavior. Higher education funding often serves as a "balance wheel" in state budgets (Hovey, 1999; Delaney & Doyle, 2011), and it takes a back seat to other budget categories, particularly during times of economic downturn.

In the U.S., the determination of state funding for higher education appears to be path dependent; state funding cuts have become a standard, self-reinforcing part of the political process for higher education (Pierson, 2000). For decades, states have followed this path with minimal pushback, and over time the logic of alternative revenue sources situating higher education as the appropriate state budget area to cut has become more mainstream (Thelen, 1999). Moving forward, historical patterns suggest that states will continue to cut funding for higher education whenever they face strain in their budget. It would take massive public pushback against the rising cost of college and a shift in the public view of higher education to divert from the current path of state disinvestment (Pierson, 2000).

The disinvestment by states in public higher education has exacerbated existing inequalities and moved U.S. higher education finance towards a more privatized or market-based approach, where students assume a greater burden and states invest in individual students, via financial aid, rather than institutions (Lacy & Tandberg, 2014). The move away from directly investing in institutions toward student financial aid may be a politically popular move as such aid provides direct benefits to likely voters. State lawmakers, who must run for reelection, may view increasing student financial aid as a politically popular strategy, and care will need to be taken to ensure that such increases aid do not come at the expense of direct institutional funding.

Institutions unable to pass on the costs associated with reduced state funding to students through tuition increases have responded by decreasing expenditures, particularly direct educational costs such as instruction, academic support, and student services (e.g., decreasing full-time faculty, limiting course offerings, reducing tutoring and advising opportunities), which may reduce the quality of education that students receive and negatively affect their overall postsecondary experience. As discussed previously, the institutions that most profoundly experience these cuts in educational expenditures, and subsequent reduction in quality and degree production, are public four-year non-research institutions and community colleges; institutions that are already under-resourced and disproportionately serve low-income and underrepresented racial groups.

As the literature reviewed in this chapter demonstrates, this disinvestment of states to their public higher education institutions has negatively impacted institutions' ability to enroll and successfully graduate students. It has also increased the complexity of U.S. higher education finance as institutions have had to seek alternative revenue streams and engage in complex enrollment management strategies (e.g., tuition discounting and recruiting out-of-state students). Institutions unable to

pass on the costs associated with reduced state funding to students through tuition increases have responded by decreasing expenditures, which may reduce the quality of education that students receive. The institutions that most profoundly experience these cuts are public four-year non-research institutions and community colleges; institutions that are already under-resourced and disproportionately serve low-income and underrepresented racial groups.

Nevertheless, lawmakers continue to debate the need for state support and the appropriate levels of public funding for higher education. A consistent theme in U.S. academic higher education has been this disconnect between research and policy. This has been most notably highlighted by George Keller's (1985) metaphor that higher education research is a "tree without fruit" because of its inability to influence decision makers. This may be nowhere more apparent than in the research on the impacts of public funding for higher education.

Ideally, policy research may serve to provide the intellectual backdrop for specific policy areas, as the steady development of theory and the accumulation of findings reshape understandings, frames, and beliefs (Hillman et al., 2015; Weiss, 1978). It is our hope that by summarizing the recent research connecting public funding of higher education to critical outcomes, we have begun to reshape the intellectual backdrop of this critical area of public policy.

Avenues for Further Research

While the literature on the impacts of changes in state higher education funding has become increasingly rigorous, researchers should continue to move toward more causal research designs, particularly those using student-level data, that isolate the effect of state appropriations on different student subgroups. Additionally, embedded in much of the literature on state appropriations is an assumption that the effect of a change in state appropriations is linear; however, it is likely that a given increase or decrease will have differential impacts on a state with low versus high funding levels. Further analysis of the heterogeneous effects of changes in state appropriations on institutions with varying reliance on state funding would help answer important questions about disparate impacts.

The grant aid literature would also benefit from the estimation of heterogeneous effects by student subgroups whenever possible. There's much to be learned about how financial aid affects students across the ability spectrum, all income levels, by racial group, and even by the timing of college or financial aid applications. Understanding these more nuanced effects may not only help with determining mechanisms, but it may also help the research and policy communities reconcile disparate findings. Additionally, it must be seen as paramount to include financial aid from all or at least other sources than the program being evaluated. Lastly, many recent studies rely on a regression discontinuity design, which estimates the local average treatment effect of a given aid program. However, policymakers are interested in more students than those near the eligibility threshold, and efforts to incorporate methods that provide all policy-relevant parameters should be considered.

Conclusion

The literature and background provided in this chapter paint a portrait of a complex and multi-sourced approach to financing higher education. We outlined the important role student financial aid has played and continues to play in lowering the cost to students and helping them access and succeed in college. However, the literature also reveals that state operating appropriations to institutions play a critical role in advancing student success. Moving forward state policymakers will need to better recognize the importance of direct support to institutions and increase their investment in institutions while continuing to invest in student financial aid. This will not be easy and will require difficult decisions and potential trade-offs. However, a reinvestment in higher education will be necessary if the U.S. hopes to broaden access and success in higher education and realize the many benefits of a robust and vibrant public higher education system.

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Appendix A

Table 7.A1 Summary of state appropriations literature review

Effects of State Appropriations on Institutions Public institutions respond to declines in state appropriations in two main ways: (1) raising tuition revenues, and (2) decreasing institutional expenditures.	
Changes in tuition State appropriations are inversely related to tuition rates at public four-year institutions Institutions raise tuition revenue by increasing out-of-state and international enrollments This strategy of raising alternative revenues is most prevalent at doctoral institutions (especially state flagships), followed by master's and bachelor's institutions. The evidence is mixed on whether two-year colleges respond to cuts by increasing tuition.	**Changes in institutional expenditures** Institutions that are unable to raise tuition and fees to the extent needed to offset state funding cuts respond to cuts in state appropriations by decreasing expenditures. The largest impact is on education and related expenditures (instruction, academic support, and student services). This response is most prevalent at two-year institutions and least common at doctoral institutions.
Effects of state appropriations on student outcomes Through the mechanisms of changes in tuition and institutional expenditures, cuts in state appropriations have a negative impact on student enrollment and graduation rates/completion outcomes.	
Student enrollment Decreases in state appropriations lead to a decrease of in-state undergraduate enrollment, with these effects lasting several years. Enrollment is not impacted equally across all sectors; students move from the public to for-profit sector. Some public four-year institutions (predominately research universities) respond to state appropriation cuts by increasing their enrollment of out-of-state undergraduate students.	**Graduation rates and completions** Decreases in state appropriations lead to: A decrease in degrees and certificates awarded at two- and four-year institutions A decrease in graduation rates at four-year colleges, with the largest impact at research/doctoral institutions A decrease in statewide bachelor's degree attainment

Table 7.A2 Summary of student grant aid literature review

Effects of financial aid on college enrollment The effects of student grant aid on overall college enrollment are mixed. Programs that offer support services in addition to financial awards are more consistently successful. Student grant aid often causes marginal students to attend more expensive institutions and institutions where they're eligible to receive aid.	
Overall college-going There's little evidence to suggest the federal Pell Grant, the largest student grant aid program, has a consistent effect on college going. Grant aid programs with advising and mentoring components are more successful in causing students to enroll in college. Student grant aid with easy application processes, simple eligibility requirements, and marketing efforts are the most successful in inducing students to enroll.	**Type of institution** Evidence consistently suggests that student grant aid programs successfully induce *where* students enroll, rather than just *if* they enroll. Merit- and need-based grant aid cause students to enroll in more expensive institutions (e.g., 4 vs. 2-year). The preponderance of evidence suggests that state merit aid programs successfully retain students in their home state for college, but further research is needed.
Effects of financial aid on college persistence & completion The evidence on the effects of grant aid on college persistence and completion is much more convincing than the evidence on enrollment with most studies suggesting aid causes students to persist and graduate at higher rates than their non-aided peers.	
Persistence Receiving student grant aid causes students to remain in college. Little is known about the heterogeneous effects of grant aid on student persistence.	**Completion** Meta-analytic evidence suggests that $1000 in student grant aid increases the probability of completion by 2.5 percentage points. Those students with the most financial need are the most likely to benefit from student grant aid. Grant aid programs that invest in the program beyond just the money given to students (e.g., mentors, intensive advising, etc.) are the programs which have been the most successful.

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