POSTSECONDARY

VALUE COMMISSION

THE ECONOMIC RETURNS TO POSTSECONDARY EDUCATION: PUBLIC AND PRIVATE PERSPECTIVES

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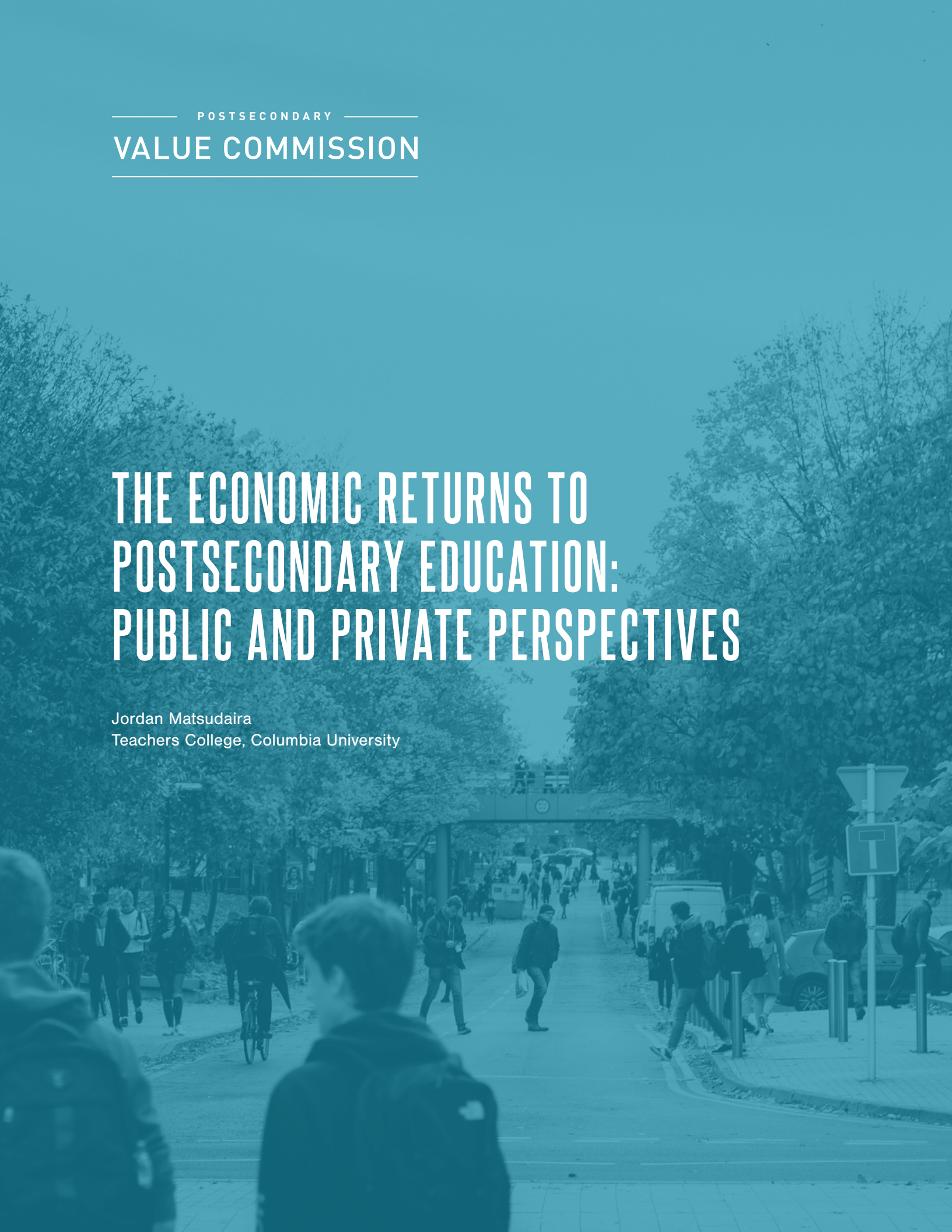

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This paper is one in a foundational research series for the Postsecondary Value Commission authored in summer 2019 by scholars with diverse backgrounds and expertise. The research presented in these papers applies an equity lens to the philosophical, measurement, and policy considerations and assumptions underlying key components of postsecondary value to students and society, including investment, economic and non-economic returns, mobility, and racial and socioeconomic justice.

The Postsecondary Value Commission consulted this foundational research as it developed a conceptual definition of postsecondary value, a framework for measuring how institutions and programs create value and ensure equitable outcomes, and an action agenda with recommendations for applying the definition and framework to change policies and practices. Through this breadth of scholarship, the commission was better able to define the value of postsecondary education and the role institutions can play in creating a more equitable and fair United States.

Following the May 2021 release of the commission's findings, these foundational papers were prepared for publication. The views and opinions expressed in these papers do not necessarily reflect the positions of individual members of the Postsecondary Value Commission or the organizations they represent.

The Postsecondary Value Commission along with the Bill & Melinda Gates Foundation and Institute for Higher Education Policy are deeply grateful to the authors of this series. The authors' extensive expertise and thoughtful engagement in this work provided the foundation for the commission to develop an informed, innovative, and equity-driven framework. They also thank Deborah Seymour for editing the written products and the team at GMMB for their creative design and layout.

Suggested citation: Matsudaira, J. (2021). The Economic Returns to Postsecondary Education: Public and Private Perspectives. Postsecondary Value Commission.

In 1776, Adam Smith wrote, "the expense of the institutions for education... is... beneficial to the whole society, and may, therefore, without injustice, be defrayed by the general contribution of the whole society," in the *Wealth of Nations*.[a] Since then, economists and policymakers have argued that the social returns to higher education exceed those accrued by individuals, justifying public investment in higher education. Smith also noted, however, that public support may not be necessary to encourage individuals' pursuit of education if the private returns were high: "This expense, however, might perhaps with equal propriety, and even with some advantage, be defrayed altogether by those who receive the immediate benefit of the education."[b]

"Economists and policymakers have argued that the social returns to higher education exceed those accrued by individuals, justifying public investment in higher education.

This paper discusses the conceptual difference between private and public *economic* returns to education, and the value of each of these metrics. It then briefly surveys evidence on the public returns to education, highlighting recent theoretical and empirical advances, and presents a brief description of how public investments affect private returns to education in the U.S. The paper concludes with a brief set of recommendations for key metrics that should be considered in institution-specific measures of public value, as well as where further research would be helpful.

MEASURING PRIVATE RETURNS TO HIGHER EDUCATION

The private return to investment in a postsecondary credential is the value of all the benefits to the individual of obtaining it minus the total cost they incur to obtain it.[c] These benefits accumulate over an individual's lifetime, and are comprised most notably of the *increase* in earnings they enjoy relative to what they would have earned without the credential.[d] Postsecondary education is also associated with key non-monetary benefits such as improved health (Carnevale et al., 2021; Cutler and Lleras-Muney, 2008; Groot and Maassen van den Brink, 2007), greater enjoyment of artistic and cultural pursuits, and greater life satisfaction, to name only a few.[e] On the other side of the ledger are the total costs incurred over the years spent pursuing a degree, including tuition and fees after deducting any grant or scholarship aid received and including subsequent education costs, any living costs while enrolled above what a student would have paid while not enrolled, and any forgone earnings due to reducing work or leaving the labor force while enrolled.

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a An Inquiry into the *Nature and Causes of the Wealth of Nations* V.i.i.5, cited in Bloom, David E., Matthew Harley, and Henry Rosovsky (2007) "Beyond Private Gain: The Public Benefits of Higher Education," in James J.F. Forest and Philip G. Altbach, eds. International Handbook of Higher Education, Springer.

b Ibid.

c These values should be understood as the present value of a stream of benefits and costs accruing over some time horizon. I abstract from these issues for ease of exposition, but discount rates and the time horizon are determinants of this present value.

d The return to attending college should always be understood as measuring its value relative to a particular alternative, such as not attending college at all, attending a 2-year (rather than 4-year) college, etc. Different benchmarks for comparison may be more or less sensible, depending on the intended use of the metric. Research studies vary in their (often implicit) reference point in calculating returns.

e See, for example, Oreopoulos and Salvanes (2009) and Marken (2021).

Most information on the value of postsecondary credentials available to students today is intended to help students and their families assess the private, financial return to various credentials.[f] For example, the College Scorecard contains information about the median earnings of former students at the institution and program level, along with annual net prices paid by undergraduate students at nearly all institutions. A growing number of states further include program-specific earnings and net price information on public websites. The purpose of information on private returns is to help students make informed decisions about whether and where to pursue postsecondary education.

MEASURING PUBLIC RETURNS TO HIGHER EDUCATION

However, the costs and benefits of higher education go well beyond those of individuals. The public return to investment on a postsecondary credential captures the net benefits to taxpayers and governments from public spending on higher education (Carnevale et al., 2021). Like information on private returns, this information can help policymakers decide whether and where to invest public dollars. Unlike private returns, the benefit and cost elements are quite different, meaning programs that provide high private returns do not necessarily provide high public returns. Accordingly, private and public assessment of the value of postsecondary programs may differ.

In several recent papers, Hendren (and coauthors) (2016, 2019) proposes a metric to evaluate and compare returns across existing or proposed public investments called the *marginal value of public funds* (MVPF). The MVPF is the ratio between the public value of a "policy"—say, enrolling a group of students in a particular postsecondary program—and its net cost to the government:

$$MVPF = \frac{\textit{Total Public Benefit}}{\textit{Net Cost}}$$

As noted above and described in more detail below, the relevant benefits and costs to evaluate public returns differ from those used to measure private returns. First, postsecondary credentials may have spillover benefits to individuals other than the person obtaining education, such as the student's children or other family members. In this case, the total public benefits might exceed private benefits. Second, the relevant cost is not what students pay, but rather the total impact of the program on the government's budget. This includes both the current outlays needed to offer the program, but also impacts on future government revenue streams through increased taxes paid or decreased expenditures on other social supports.

The MVPF can be thought of as the value of one dollar in government expenditures on a particular program which might be greater to or less than the amount spent.

A special case occurs when a program generates public benefits that exceed total costs; for example, when students' earnings increase so substantially that their increased taxes more than offset the initial outlays to fund the program. In this case the MVPF is infinite, and public investments

f Current efforts are far from adequate, despite the real progress made. Future work should, *inter alia*, develop more individualized forecasts of the earnings outcomes a student might expect across a range of program and institution choices; generate better estimates of lifetime, rather than point-in-time returns; and convey the uncertainty or riskiness of future outcomes.

"pay for themselves" rather than compete with other spending priorities. As noted below, several studies have identified higher education investments where the MVPF appears to be infinite.

SPILLOVER BENEFITS OF HIGHER EDUCATION

Decades of research have documented the substantial financial and non-financial returns to individuals from pursuing postsecondary education. The evidence on the extent to which education has spillover effects that improve lives beyond the educated individual is more limited, but several studies suggest that public benefits may be larger than private benefits. Echoing early rationales for public support for education to promote democracy through an educated populace, Dee (2004) finds that college attendees are more likely to vote and more likely to support free speech. While robust evidence of a causal impact does not yet exist, college attainment is positively correlated with a variety of other measures of civic engagement, community involvement, philanthropic activity, and volunteerism (Trostel, 2015). Reduced criminality is also often cited as a way that education improves the lives of others, since it means safer communities and a lower likelihood of becoming a victim of crime (Lochner and Moretti, 2004). Most of the impact of increases in educational attainment on crime, however, appears driven by increases in high school completion (Lochner, 2011) rather than attending college, though the literature is thin. On the other hand, a growing literature suggests education programs for individuals in prison can be highly effective in reducing recidivism and criminal justice system involvement (Davis et al., 2013).

An important but underdeveloped area of research is whether more educated individuals increase the productivity of workers around them. For example, does having a manager with higher levels of education improve the productivity of the workers on their team? Moretti (2004a) tests for such spillovers at the city-economy level and finds that a one percentage point increase in the share of college graduates in the labor force increases wages for high-school dropouts and workers with only a high-school degree by 1.9 percent and 1.6 percent, respectively, using data from 1970 to 1990. Moretti (2004b) extends this study and shows that when a city experiences an increase in college graduates in a sector, worker output in that sector increases. Economists have speculated that social interactions among workers are more important in high tech industries (Moretti, 2004c), but more research is needed to verify the magnitude of such productivity spillovers and how they may have changed over time. In a similar vein, recent international research by Valero and Van Reenen (2019) finds that increases in the number of universities in a region increases GDP growth per capita, driven in part by greater innovation. Despite the potential importance of these spillovers, research is far from providing practical guidance on estimating their magnitudes overall, let alone for particular institutions or programs.

NET GOVERNMENT COSTS: DIRECT EXPENDITURES

The net costs to government needed to calculate the private returns of postsecondary education can be conceptually divided into two parts: 1) the direct government expenditures on the public program, and 2) indirect fiscal impacts driven by changes in individuals' behavior. Data on both of these components are lacking, though recent research has made progress on both fronts.

In contrast to the substantial information on what students *pay* for their education, data on what particular programs *cost* is much harder to come by. Most researchers until recently relied on institution-level data on education and related expenses from the Delta Cost Project, based on Integrated Postsecondary Education Data System (IPEDS) data. With increased attention to program-level differences in students' labor market earnings, however, attention has shifted to more granular measures of program costs. The best information widely available comes from the Delaware Cost Study, which collects program-level spending data for about 22,000 programs (based on 4-digit CIP) across about 700 four-year public and private institutions. Some researchers have used state specific cost data at the program level as well (Altonji and Zimmerman, 2018). Unfortunately, these sources of program level data are limited in scope. For example, since participation in the Delaware Cost Study is voluntary, there are no comprehensive data to compare costs across postsecondary programs in different states; and at present, no data exist for programs at community colleges or non-degree granting institutions.[g]

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Both Delta Cost Project and Delaware Cost Study data reveal important differences in the costs of education across institutions and programs.[h] Delta Cost Project data have shown that education expenditures per student are highest in private, doctoral institutions, and lowest at associate's degree-granting, public institutions.[i] Research using program-level cost data shows large differences across programs, with electrical engineering and health sciences programs, for example, costing substantially more per student compared to business, psychology, or social science programs. Differences in class-size and faculty salaries account for the majority of the differences in costs across programs (Hemelt et al., 2018). These cost differences are large enough that they can reverse our evaluation of which programs produce the highest value depending on whether measures include social costs and benefits or isolate private returns to individuals (Altonji and Zimmerman, 2018).

NET GOVERNMENT COSTS: FISCAL IMPACTS

A striking finding of several recent research studies is that direct government expenditures on postsecondary education can be fully offset by increases in tax revenues and decreased social service utilization resulting from increased student earnings.[j] Hendren and Sprung-Keyser (2019) reviewed 40 higher education policies—mostly financial assistance programs targeting lower income students, both traditionally aged students and older adults—and found six programs that generated earnings increases large enough that the increased tax revenue and reduction in social services expenditures more than offset the cost of the program. Since these indirect effects are counted as costs, the MVPF is actually infinite—the programs more than pay for themselves. Examples of

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g Plans are underway to adapt the survey for community colleges.

h Note Altonji and Zimmerman (2018) exploit Florida state administrative data to explore differences in costs across programs. This is an underexploited source of data to shed light on differences across programs—validating results using data from other states would be valuable.

i See, for example, College Board (2018). Comparable expenditure data for proprietary institutions is unavailable.

j By no means is this always the case, but in general if programs have large impacts on individuals' earnings then the chances are high that increases in taxes paid by the individual will pay for governments' investments over time. Of course, the public returns to federal versus state government investments may differ based on the level of state taxes, and the share of college graduates that remain in the state.

such “programs” include increased Pell and state grant aid eligibility in Texas (Denning, Marx, and Turner, 2017) and having students attend a four-year school rather than community college in Florida (Zimmerman, 2016). More generally, even when higher education spending does not pay for itself, accounting for fiscal impacts generally reduces net costs: for roughly half of the programs Hendren and Sprung-Keyser evaluate, the total net cost to the government is less than the cost of the initial outlays. It should be noted that their calculations are likely conservative, in that spillover benefits are ignored: only increases in earnings of participants in the program are counted as benefits.

However, uncertainty in the estimates of public costs and benefits undermines firm conclusions about the value of particular types of spending (Hendren & Sprung-Keyser, 2019). Even for very similar programs, estimates of the MVPF vary dramatically, and researchers have few clues to follow to understand why. The growing availability of federal and state administrative data provide new opportunities to document both the private benefits—in terms of increased earnings—and broader fiscal impacts of postsecondary education. For example, many of the estimates used in Hendren and Sprung (2019) rely on aggregate relationships between earnings, tax revenues, and service (e.g., Medicaid, SNAP participation, etc.) utilization. They could be greatly improved using administrative data on actual student earnings, taxes paid, and public benefits utilization to directly estimate fiscal impacts for particular programs.

“The growing availability of federal and state administrative data provide new opportunities to document both the private benefits—in terms of increased earnings—and broader fiscal impacts of postsecondary education.

PUBLIC SPENDING AND PRIVATE RETURNS

High public returns motivate public spending; however, recent trends in state higher education illustrate how public spending cuts can also influence private returns. First, Deming and Walters (2018) show that reductions in state appropriations for public two- and four-year colleges lead to decreases in education expenditures, and in turn, degrees awarded. This establishes a link between public investments and education quality, and students’ completion outcomes—strongly suggesting public investments increase students’ degree attainment and future earnings.

Public appropriations and public financial aid programs also affect the net price students pay for their education. Both Deming and Walters (2018) and Webber (2017) demonstrate that public institutions respond to state budget cuts by increasing their tuition, and thus the net prices students pay. Webber’s estimates suggest that over the past 20 years, approximately 30 percent of state appropriation cuts have been passed along to students in the form of higher net prices, and this rate is fairly similar across institutional levels. More directly, federal and state financial aid programs directly reduce the net price students pay and thus mechanically increase the private returns to education.

Table 1 shows how government investments subsidize education quality, proxied by the level of education and related expenditures per student across different types of institutions.[k] For reference,

k A flaw with these data is that the subsidy column includes institutional grants, so they do not reflect only government investments.

the share of students of four different race-ethnicities attending each type of institution is also shown in the table.

Table 1. Net Tuition Revenues, Subsidies, and Education and Related Expenditures per Full-Time Equivalent (FTE) Student in 2015 Dollars, and Share of Students Enrolled by Race/Ethnicity 2015-2016

Institutional Type	Net Tuition Revenue	Subsidy	Education and Related Expenditures	Subsidy as a Percentage of Education and Related Expenditures	White Share of Enrollment	Black Share of Enrollment	Hispanic Share of Enrollment	Asian Share of Enrollment
Public Doctoral	$11,650	$7,620	$19,270	40%	0.25	0.17	0.19	0.31
Public Master's	$7,860	$6,670	$14,530	46%	0.13	0.12	0.11	0.11
Public Bachelor's	$6,100	$7,410	$13,510	55%	0.06	0.07	0.10	0.06
Public Associate	$3,510	$6,570	$10,080	65%	0.27	0.3	0.42	0.28
Private Nonprofit Doctoral	$24,070	$20,540	$44,610	46%	0.07	0.05	0.04	0.11
Private Nonprofit Master's	$15,940	$2,560	$18,500	14%	0.09	0.08	0.05	0.05
Private Nonprofit Bachelor's	$16,160	$10,380	$26,540	39%	0.04	0.04	0.02	0.02
Private For-profit	-	-	-	-	0.05	0.14	0.06	0.04

Notes: Net tuition revenue is the amount of revenue an institution takes in from tuition and fees, net of all institutional grant aid provided to students. Some of this revenue comes in the form of Pell Grants and other financial aid from federal and state governments and other sources. Subsidies are defined as the portion of the cost of educating students not covered by net tuition revenue. Education and related expenditures include spending on instruction, student services, and the education share of spending on central academic and administrative support, as well as operations and maintenance. Expenditures for both undergraduate and graduate students are included in these estimates. Institutional averages are weighted by 12-month FTE enrollments. The race/ethnicity categories are based on those used by IPEDS.

Sources: Columns A-F of this table are taken from College Board (2018), figure 18, which uses NCES, IPEDS Finance data for 2016. Columns G-J use enrollment by race from Digest of Education Statistics 2017, Table 306.5. These data were the most recent available at the time this paper was written.

While comparable data on education expenditures and subsidy rates are not available for for-profit institutions, researchers have documented that for-profit colleges on average charge substantially higher net prices and have worse student outcomes than not-for-profit colleges (Cellini and Turner, 2016; Deming et al., 2012). The data show that government and institutional resources greatly reduce educational costs to students. The subsidy as a percentage of total education expenditures is highest at public two-year institutions, though the absolute value of the subsidy is smaller. At public two-year schools, students pay only about a third of their educational costs, on average. Black and Latinx students are overrepresented in this sector, and Black students are greatly overrepresented in for-profit colleges. The result of these patterns of enrollment are that Black and Latinx students are differentially exposed to institutions with lower educational quality (as proxied by education expenditures).

DEVELOPING INSTITUTION-SPECIFIC METRICS TO CAPTURE PUBLIC RETURNS

Measures of public returns are a useful input to government decision making about which programs and institutions to support. With the growing availability of state and federal administrative data systems, it is increasingly feasible to develop estimates of the public *financial* returns to higher education institutions and programs. These estimates should be based on: a) students' earnings after college, measured over as long a time horizon as possible; b) the taxes paid to the relevant levels of government and the costs of participation in government programs over a similarly long time horizon; and c) the portion of the cost of students' education paid for by the relevant level of government. While it would be desirable to measure the spillover and non-financial effects of education, at present no methodology for incorporating either of such costs exists—especially at an institution or program level.

A focus on equity can be incorporated by reporting a) the share of overall enrollment of various student subgroups, and b) the public return on investment for each group. Student subgroups might be defined by race, by some combination of parental income and/or wealth, or by other dimensions along which we might prioritize addressing inequity such as gender, linguistic background, immigrant status, or geography. Institutional leaders or policy makers using the metrics could then decide how to weigh the numbers of various groups they are serving, and how well they are serving them in assessing institutions' performance in achieving the equity goals they find important.

While new data have created unprecedented opportunities to create measures of the public value of higher education, the empirical challenges and limitations in doing so should not be dismissed. The largest challenges are: 1) assessing the relative importance of non-financial outcomes of higher education; and 2) measuring a particular institution or program's causal impact on both costs and outcomes (e.g., earnings or social service utilization). On the first challenge, surveys designed to elicit how educational choices affect subjective wellbeing offer a promising avenue to make progress, along the lines of previous work by Benjamin et al. (2014). On the second, research examining the extent to which broadly applicable non-experimental estimators can replicate experimental or quasi-experimental estimates of college value-added would be tremendously valuable.

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