Examining Instructional Spending for Accountability and Consumer Information Purposes

FEBRUARY 28, 2019 — JOHN J. CHESLOCK

Kenneth Arrow, a Nobel prize winner in economics, has noted that "education is the supreme example of a product subject to asymmetric information."[1] Nowhere is this more true than in the market for higher education, where the sellers (colleges) typically know way more about the product than the buyers (students). When students are making college enrollment decisions, they are typically at a great disadvantage, because they do not know what they will learn. If they already knew that information, they would not need to enroll.

There are multiple possible solutions to this challenge. One solution would be for colleges and universities to restrain themselves from exploiting their informational advantage. Although many higher education institutions have foregone opportunities for advancement at the expense of their students, history has also shown that some institutions have acted poorly. Another solution would be for further data to be collected and shared broadly so that all parties can have better information about the educational product that is being offered. Students can utilize that knowledge in their enrollment choices, and policymakers can utilize that information when seeking to hold colleges and universities accountable.

Information can be collected on the inputs and outputs of higher education institutions. This report focuses on inputs as it explores potential measures that can describe the degree to which higher education institutions spend the dollars collected for instruction on instruction. Prospective students would benefit from knowing when a particular institution only spends a small fraction of collected dollars on the instruction that students receive. Yet, despite this need, relatively little attention has been paid to the spending patterns of colleges and universities and the communication of those patterns to the general public.

This report starts by describing potential spending measures that can be constructed using the data currently available through the Integrated Postsecondary Education Data System (IPEDS). IPEDS data from the 2014–15 fiscal year are used to describe how these spending measures vary across higher education institutions. This exercise highlights numerous limitations in existing data as well as conceptual questions pertaining to the definition of instruction and the degree to which dollars should support instruction. The report concludes with a discussion of these data limitations and conceptual questions and seeks to outline an agenda for further inquiry.

This report can be found online at: https://tcf.org/content/report/examining-instructional-spending-accountability-consumer-information-purposes/.

The Data: IPEDS

A straightforward way to measure the degree to which higher education institutions spend dollars collected for instruction on instruction is to use a ratio. The numerator of the ratio would capture the resources spent on instruction, while the denominator would measure the amount of resources collected for instruction. The best source of data for constructing such a ratio would be the finance survey from IPEDS, because this survey contains a range of measures of revenues and expenditures for individual higher education institutions and provides publicly available data for almost every college and university in the United States.

Data from the finance survey are complex, because reporting standards vary across institutional control. Separate reporting formats exist for public institutions, private nonprofit institutions, and private for-profit institutions. Furthermore, schools differ in the accounting standards they use, with some schools using the standards set by the Governmental Accounting Standards Board (GASB) and other schools using the standards set by the Financial Accounting Standards Board (FASB).

A variety of resources provide helpful background information on IPEDS financial data. The survey materials associated with the IPEDS Data Collection system list the exact questions that each institution answers when providing the data that are used in IPEDS.[2] The National Association of College and University Business Officers (NACUBO) have created a Financial Accounting and Reporting Manual (FARM) that university officials often consult when calculating financial figures. Access to the FARM requires one to purchase a subscription, but other materials from NACUBO that provide guidance regarding financial reporting are publicly available. For example, NACUBO has created a number of advisory reports that contain helpful information on specific topics.[3] Advisory reports 1997–01 and 2000–05 contain information pertaining to institutional aid and discounting that meaningfully informed the creation of this report.

The Numerator: Spending on Instruction

Two alternative measures are used to examine the level of resources that institutions commit to instructing students:

- instructional (INSTR) expenditures: the amount of spending on instructional programs; and

- education and related (E&R) expenditures: the amount of spending on student-related educational activities.

The first measure is a pure version that only contains expenditures meant to support instruction within formal coursework. The second measure includes those expenditures plus expenditures for educational activities that occur outside of formal coursework and expenditures for other functions that provide the foundation and infrastructure upon which education takes place.

Instructional (INSTR) Expenditures

In IPEDS, higher education institutions report expenditures according to functional expense categories that are based on the reason why an expense occurred rather than what was purchased. One of those categories is instruction, which includes multiple types of instruction: general academic instruction, vocational/technical instruction, community education (non-credit), and preparatory/remedial instruction. In addition, instructional information technology is included when schools separately account for information technology resources.[4] Our first measure simply equals this category of expenditures from IPEDS. Appendix Table 1 lists the specific variables (for each version of the IPEDS survey) that are used to measure instructional expenditures. This table also contains information for variables that will be discussed in the following sections of this report.

Education and Related (E&R) Expenditures

Our first measure omits some costs that play an important role in the instruction of students. Items such as libraries,

academic administrators, and course and curriculum development play a key role in supporting instruction, and items such as executive leadership, fiscal operations, and human resources provide the organizational structure within which instruction happens. In addition, colleges and universities offer students a range of activities that complement formal instruction via contributions to students' emotional and physical well-being, and to their intellectual, cultural, and social development.

Our second measure will also include the costs associated with these additional items. Unfortunately, the functional expense categories in IPEDS are not precise, so the available IPEDS variables represent general categories that include a range of items. The three categories that are promising candidates for inclusion are:

- *Student services* is a category that includes administrative functions such as the registrar and admissions as well as activities that occur outside of the student's formal instructional program but are focused on advancing the student's development. These activities can relate to a number of student outcomes including emotional and physical well-being and intellectual, cultural, and social development. NACUBO's Financial Accounting and Reporting Manual uses eight sub-categories to describe the contents of student services: student services administration, social and cultural development, counseling and career guidance, financial aid administration, student admissions, student records, student health services, and student services information technology.

- *Academic support* is a category that includes expenses incurred by the institution when it provides support services for the primary activities of instruction, research, and public service. NACUBO's FARM uses eight sub-categories to describe the contents of academic support: libraries, museums and galleries, educational media services, ancillary support, academic administration, academic personnel developments, course and curriculum development, and academic support information technology.

- *Institutional support* is a category that includes expenses associated with the management and long-term planning for the entire institution. NACUBO's FARM uses five sub-categories to describe the contents of institutional support: executive management, fiscal operations, general administration, public relations/development, and administrative information technology.

One could combine these categories alongside instruction in a variety of methods. The combination used in this report will be based on the E&R costs grouping previously outlined by the Delta Cost Project.[5] That grouping is calculated as follows:

- E&R expenditures = instruction + student services + {education share * (academic support + institution support)}

  o education share = (instruction + student services) / (instruction + student services +research + public service)

The logic associated with this measure is that academic support and institutional support relate to research and public service as well as instruction, so only a portion of these categories should be included. The implicit assumption in the measure is that the share should be identical to the instructional share of the total direct costs of these activities.

The measure also treats student services expenditures as equivalent to instruction expenditures in that all of these costs should be included. For most subcategories of the student services classification, this decision is reasonable. The cultural events, student organizations, student newspaper, and other activities associated with the social and cultural development subcategory can play an important role in a student's education. The activities associated with the counseling and career guidance subcategory are similarly important. Student health services—which count here

when health services are not self-supporting—are also key given the importance of student health for learning. The subcategories of student services administration, financial aid administration, student records, and student services information technology are much less compelling as an activity but are clearly costs required for education to take place.[6]

The subcategory of student admissions is the one portion of student services that raises the most questions. According to NACUBO's FARM, this category includes expenses associated with the identification of prospective students, the promotion of attendance at the institution, and the examination of applications. Some of the costs associated with this subcategory are similar to the just-mentioned categories representing functions that are required for education to take place. After all, a student's education will likely be harmed if she does not have any classmates with whom she can interact. On the other hand, these costs can also relate to an institutional focus on enrollment growth for reasons unrelated to student learning, and in that case, these costs seem inappropriate for the E&R category. Unfortunately, IPEDS data does not report data for individual subcategories, so it is impossible to adjust for this concern. Because the scale of marketing costs can be substantial at institutions focused on heavy enrollment growth, I will return to this consideration later in the report.

Appendix Table 1 contains the IPEDS variables that are used to calculate the E&R measure. Research and public service are included in order to calculate the education share of academic support and institutional support. These categories are mostly self-explanatory. The research classification includes institutes and research centers, individual and project research, and research information technology. The public service classification includes community service, cooperative extension service, public broadcasting services, and public service information technology.

The Denominator: Revenues Collected for Instruction

To examine the share of funds collected for instruction that actually go to instruction, a measure of the amount of funds collected for instruction is needed. Two alternative measures will be used:

- collected tuition and fee revenue (CTFR): funds collected by the institution from external sources to cover tuition and fees; and

- collected tuition and fee revenue + operating subsidies share (CTFR + OSS): CTFR plus the instructional share of appropriations provided by state and local governments.

The first measure will allow us to examine how much institutional spending occurs for every dollar of tuition and fee revenue that the institution collects. The second measure also includes funds the institution collects from state and local governments to help cover instructional costs. I will describe each measure in turn.

Collected Tuition and Fee Revenue (CTFR)

In order to cover the listed tuition charged to each student, an institution collects funds from students and their families, governmental grant programs, donors, and others. In some cases, the funds collected are less than the listed tuition, and the institution simply provides the student with an institutional grant award that does not reflect collected revenue. To measure CTFR, one simply needs to measure gross tuition revenue (that is, the total amount of listed tuition that is charged) and then subtract these "unfunded" institutional grant awards.

No single variable in IPEDS contains the amount of tuition and fee revenue that is collected. IPEDS does, however, contain a set of variables that can be combined in order to produce an estimate of collected tuition and fee revenue. In general, the formula used to measure collected tuition and fee revenue is the following:

- CTFR = net tuition and fees + discount and allowances applied to tuition and fees – institutional grants from unrestricted sources

Appendix Table 1 lists the specific variables (for each accounting method) that are extracted from the IPEDS finance surveys to produce this measure.[7]

Gross tuition and fee revenue (that is, the total amount of listed tuition and fees that is charged) equals the sum of net tuition and fees and the discounts and allowances applied to tuition and fees. In general, net tuition and fees is comprised of payments by students and their families as well as payments by third parties that specify the specific students who should receive the awards. In contrast, discounts and allowances reflect payments by third parties that allow the institution to select the recipient of the award.

An example would help illustrate this distinction. When a community organization forwards a check to a university to cover the tuition and fees of a specific student, then this payment is included in net tuition because the third party specified the recipient. In contrast, when a donor provides funds to a university for a scholarship to be awarded by the university, then these funds are treated as gift revenue rather than tuition revenue and a discount and allowance is recorded when the gift funds are used to pay for the student's tuition and fees.

The primary point of confusion regarding this distinction relates to the treatment of Pell Grants, because the treatment of these awards varies by accounting method. For institutions using GASB methods, Pell grants are treated as governmental grant revenue and recorded as a discount and allowance when the funds are used to pay for a student's tuition and fees. For institutions using FASB methods, Pell grants are typically treated as tuition and fee revenue. Although confusing, these differences do not create a challenge for our purposes, because the formula simply combines net tuition and fee revenue with the discounts and allowances applied to tuition and fees to produce our measure of gross tuition and fees.

Institutional grants from unrestricted sources are subtracted from gross tuition and fees, because these grants often do not represent new funds that are collected by the institution. These unrestricted grants, sometimes referred to as unfunded grants, are usually akin to "coupons" that cause the institution to collect less tuition and fee revenue for a student than the amount suggested by listed tuition and fee prices. In contrast, grants from restricted sources, sometimes referred to as funded grants, are backed by funds provided to the institution by private donors or governmental grant programs. From the student's perspective, the nature of the grant award is irrelevant because the payment required by the student is reduced in both cases. But from the institution's perspective, the distinction is vital. Grants from restricted sources represent specific dollars that were collected by the institution and could be used to pay for instructional costs.[8] Unrestricted institutional grants typically do not.

When institutional grants from unrestricted sources are subtracted from gross tuition and fees, we are not simply removing institutional grants that are applied to tuition and fees. Institutional grants that are applied to auxiliary enterprises (for example, grants used to cover a student's on-campus housing costs) and grants that are treated as a scholarship and fellowship expense (for example, grants that are paid to a student so that she can pay for off-campus housing) are also subtracted. All three forms of unrestricted institutional grants are subtracted for two reasons. First, IPEDS simply reports an overall measure, so we don't have the option of only subtracting unrestricted institutional grants that are applied solely to tuition and fees. Second, there is a good reason to subtract these other types of grants: when an institution pays for a student's housing without having

a funding source to cover this expense, the institution has fewer funds available to pay for instructional costs.

Collected Tuition and Fee Revenue + Operating Subsidies Share (CTFR + OSS)

Public institutions often receive state and local appropriations that are partially provided so that the institution can cover instructional costs while keeping tuition and fees relatively low. For that reason, one might wish to also include a portion of these funds alongside collected tuition and fee revenue in the denominator. Because state and local governments do not dictate the share of their appropriations that should go to instruction versus research and public service, the education share is used to produce an estimate of the appropriations that are focused on instruction. The specific measure for operating subsidies share is as follows:

- OSS = education share * (local appropriations + state appropriations)

  o education share = (instruction + student services) / (instruction + student services + research + public service)

Appendix Table 1 lists the specific IPEDS variables used to measure local and state appropriations.

These variables do not include grants and contract revenue from state and local governments because separate IPEDS variables capture these forms of revenue. Grant and contract revenue are not included because governmental grants provided to cover a student's tuition and fees are already included in the CTFR portion of our measure. Other forms of governmental grants are often provided to support activities unrelated to instruction.

The OSS portion of our measure primarily relates to annual appropriations provided to cover the operating expenses of the institution. One exception is that capital appropriations are not included. The local appropriations variable also includes education district taxes. Local appropriations are most relevant for public community colleges. In general,

appropriations are typically only relevant for public colleges and universities.

Although figures are included for nonprofit and for-profit private institutions, those figures are typically zero.

An Empirical Description of Spending Ratios

In this section, I use data from the 2014–15 fiscal year—which is the most recent year of finalized data from the IPEDS Finance Survey—to further explore these potential measures. I constructed the dataset so that the unit of observation was at the level of the Office of Postsecondary Education ID (OPEID). The six-digit OPEID is shared by all IPEDS observations that also share the same program participation agreement (PPA) with the federal government. A PPA is required for a higher education institution to become eligible to enroll students receiving federal financial aid under Title IV. When data are collapsed to the six-digit OPEID level, the unit of analysis is constant across observations, the unit of analysis has a helpful interpretation, and the necessary data for the analysis are available for each observation.[9]

Four different spending ratios were constructed by combining the two proposed numerators and the two proposed denominators as follows:

- INSTR/CTFR

- INSTR/CTFR + OSS

- E&R/CTFR

- E&R/CTFR + OSS

The latter two measures should be substantially larger than the first two measures, because education and related (E&R) expenditures include a range of expenditures in addition to instructional (INSTR) expenditures. For public institutions, we should expect the measures with collected tuition and fee revenue plus operating subsidy share (CTFR + OSS) to

TABLE 1

Expenditure Ratios				
Numerator	INSTR	INSTR	E&R	E&R
Denominator	CTFR	CTFR + OSS	CTFR	CTFR + OSS
National ratio (ratio of aggregated sums)	0.92	0.70	1.60	1.20
Median ratio (institution-level observations)	0.66	0.56	1.33	1.20
Median ratio (student-level observations)	0.96	0.61	1.64	1.07
Note: These figures are calculated from data from 5,493 higher education institutions enrolling 17,153,692 full-time equivalent students.				

TABLE 2

Ratio Percentiles, Institution-Level				
Numerator	INSTR	INSTR	E&R	E&R
Denominator	CTFR	CTFR+OSS	CTFR+OSS	CTFR
1st percentile	0.12	0.12	0.33	0.33
5th percentile	0.21	0.21	0.54	0.54
10th percentile	0.27	0.27	0.71	0.69
25th percentile	0.42	0.41	0.98	0.92
50th percentile	0.66	0.56	1.33	1.10
75th percentile	1.23	0.71	2.26	1.34
90th percentile	2.25	1.04	4.07	2.01
95th percentile	3.37	1.65	5.93	3.17
99th percentile	10.60	6.76	19.69	12.55
Note: These figures are calculated from data from 5,493 higher education institutions enrolling 17,153,692 full-time equivalent students.				

TABLE 3

Ratio Differences by Institutional Control and Level					
Numerator	# Observations	INSTR	INSTR	E&R	E&R
Denominator		CTFR	CTFR+OSS	CTFR	CTFR+OSS
National ratio (ratio of aggregated sums)					
Degree-granting					
Public four-year	642	1.13	0.75	1.75	1.16
Private NP four-year	1,497	0.79	0.78	1.42	1.42
Private FP four-year	233	0.26	0.26	0.90	0.90
Public two-year	893	1.56	0.61	2.80	1.09
Private FP two-year	304	0.34	0.34	0.92	0.92
Non-degree-granting					
Public	316	1.78	0.65	2.94	1.08
Private NP	118	0.76	0.76	1.30	1.30
Private FP	1,419	0.39	0.39	0.88	0.88
Median ratio (institution-level observations)					
Degree-granting					
Public four-year	642	1.10	0.64	1.91	1.10
Private NP four-year	1,497	0.57	0.57	1.27	1.27
Private FP four-year	233	0.32	0.32	0.97	0.97
Public two-year	893	1.60	0.61	2.97	1.10
Private FP two-year	304	0.34	0.34	0.97	0.97
Non-degree-granting					
Public	316	1.42	0.73	2.01	1.03
Private NP	118	0.82	0.82	1.37	1.37
(Weighted) median ratio (student-level observations)					
Degree-granting					
Public four-year	7,192,417	1.03	0.66	1.68	1.07
Private NP four-year	3,741,029	0.56	0.56	1.16	1.16
Private FP four-year	1,181,336	0.22	0.22	0.89	0.89
Public two-year	4,206,477	1.58	0.60	2.84	1.08
Private FP two-year	341,476	0.32	0.32	0.94	0.94
Non-degree-granting					
Public	85,348	2.22	0.69	3.32	1.00
Private NP	20,305	0.60	0.60	1.14	1.13
Private FP	361,058	0.38	0.38	0.94	0.94

be lower than measures with just collected tuition and fee revenue (CTFR), because CTFR + OSS includes additional revenues and forms a larger denominator.

The analysis in this report will simply describe the values for each of these four ratios for every Title IV–eligible institution in the United States. Descriptions can occur at three different levels. The highest level would be the national ratio, which is computed by aggregating figures for all schools for both the numerator and the denominator and then dividing the aggregated numerator by the aggregated denominator. The next level would contain institution-level observations, which leads to separate ratios for each college and university in the United States. The median ratio at this level would describe the spending practices of the median institution. The last level would contain student-level observations, which can be produced by weighting each institution-level observation by the full-time equivalent enrollment of the institution. The median ratio[10] at this level would describe the experience of the median student.

The major reveal major differences across higher education institutions. For example, the median values for the INSTR/(CTFR + OSS) measure is 0.56 but many schools have figures far from that value. The tenth percentile indicates that 10 percent of schools have ratios that are below 0.27 while the ninetieth percentile indicates that ten percent of schools have ratios that exceed 1.04. The twenty-fifth and seventy-fifth percentiles—which equal 0.41 and 0.71—also denote substantial variation.

The values for the 99th percentile are concerning, because schools should not be able to spend drastically higher amounts on instruction than they collect for instruction.[11] These cases likely highlight limitations in our measures and inaccurate reporting by some schools. The institutions with extremely large ratios are typically non-degree granting institutions, two-year institutions, and special focus institutions (for example, medical institutes, abd seminaries), categories that contain many schools that collect small amounts of tuition and fee revenue per student and instead rely heavily on other sources of revenue. Regardless of their classification, schools with large ratios typically have instructional expenditure figures (that is, numerators) that are similar to other schools but have very low denominators because they collect relatively little tuition and fee revenue.

The values for the lowest percentiles may also be primarily driven by measurement error or limitations in our measures. Non-degree-granting institutions and degree-granting for-profit institutions are disproportionately represented in the bottom 1–5 percent of schools. Regardless of their classification, schools with low ratios have revenue figures (that is, denominators) that are similar to other schools but have very low numerators because they report very little spending on instruction.

Table 3 examines whether and how our measures vary by institutional control and level and reveals a number of patterns. In general, public institutions report higher ratios than private nonprofit (NP) institutions; private for-profit (FP) institutions report the lowest ratios. The distance between publics and other institutions is much greater when CTFR is used than when CTFR+OSS is used, which is expected because operating subsidies are almost exclusively provided to public institutions. Another systematic pattern is that private NP four-year institutions have the highest values when E&R and CTFR+OSS are used to form the ratio.

TThese differences are present for the national ratio as well as the median ratios at the institution level and student level, but the magnitude of some differences vary by measure. For example, the value for INSTR/CTFR+OSS for private for-profit four-year institutions falls from 0.32 to 0.22 when our focus moves from institution-level comparisons to student-level comparisons, because the ratios are especially low for private for-profit four-year institutions with very large enrollments.

The substantial differences across institutional types reported in Table 3 exist alongside substantial differences within institutional types. Table 4 reports percentiles separately for public, private nonprofit, and private for-profit degree-granting institutions for selected measures. Substantial variation exists within each institutional type, with the largest differences occurring among private nonprofit institutions.

TABLE 4

Range of Values for Ratios, by Control				
	Institution-Level Observations		Student-Level Observations	
Numerator	INSTR	E&R	INSTR	E&R
Denominator	CTFR + OSS	CTFR + OSS	CTFR + OSS	CTFR + OSS
Degree-granting public institutions				
# Observations	1,535	1,535	11,398,894	11,398,894
1st percentile	0.36	0.75	0.39	0.77
5th percentile	0.45	0.86	0.48	0.86
10th percentile	0.48	0.93	0.51	0.92
25th percentile	0.55	1.01	0.56	0.98
50th percentile	0.62	1.10	0.64	1.07
75th percentile	0.71	1.23	0.73	1.19
90th percentile	0.85	1.45	0.89	1.36
95th percentile	1.07	1.75	1.04	1.54
99th percentile	2.95	5.34	1.68	2.22
Degree-granting private nonprofit institutions				
# Observations	1,568	1,568	3,765,275	3,765,275
1st percentile	0.17	0.58	0.18	0.65
5th percentile	0.29	0.81	0.26	0.80
10th percentile	0.36	0.91	0.36	0.90
25th percentile	0.46	1.07	0.46	1.01
50th percentile	0.57	1.27	0.56	1.16
75th percentile	0.74	1.66	0.73	1.39
90th percentile	1.17	2.63	1.25	2.15
95th percentile	1.78	4.09	1.95	2.78
99th percentile	4.47	11.48	4.47	5.68
Degree-granting private for-profit institutions				
# Observations	537	537	1,522,812	1,522,812
1st percentile	0.09	0.30	0.09	0.37
5th percentile	0.15	0.45	0.14	0.56
10th percentile	0.19	0.52	0.17	0.64
25th percentile	0.25	0.77	0.19	0.79
50th percentile	0.33	0.97	0.24	0.90
75th percentile	0.46	1.13	0.32	1.01
90th percentile	0.60	1.51	0.46	1.31
95th percentile	0.80	1.86	0.54	1.51
99th percentile	1.56	4.57	1.55	3.62

TABLE 5

The Share of Educated and Related Expenditures that are Due to Student Services			
		Correlation with	
	# Observations	FTE Enrollment	% Exclusively Online
Public four-year	642	-0.245	0.167
Private NP four-year	1,497	-0.026	0.060
Private FP four-year	233	0.157	0.251
Public two-year	893	-0.039	-0.062
Private FP two-year	304	0.189	0.057

Although not reported here, I also examined whether the results for our measures varied by an institution's Carnegie Classification or by whether or not the institution is a Historically Black College or University (HBCU). In both cases, the observed values did not substantially differ across categories of institutions when comparisons are made between schools in the same control categories (public, private NP, and private FP).

Data analysis can also shed light on the limitations of available data. For example, as noted earlier, the category of student services contains a range of different types of spending. Some types align fairly well with the broader definitions of instruction, but other types—especially expenses associated with marketing and recruitment—do not.

Table 5 describes how the share of E&R expenditures that come from student services expenditures correlates with the full-time equivalent (FTE) enrollment of the institution and the share of students that is enrolled exclusively online. The results reveal that the student services expenditures share is positively correlated with enrollment size in the for-profit sector and positively correlated with the share of students who are enrolled exclusively online in the entire four-year sector.

Table 5 provides suggestive evidence that the differences in marketing and recruitment expenditures are driving a meaningful portion of the variation in the category of student services. Nonprofit institutions with large online programs and large for-profit institutions, which primarily enroll students who participate in online education, engage in heavy marketing in order to succeed in the competitive national market for online education. Schools with large online enrollments do not necessarily spend more on other areas associated with the IPEDS student services category (for example, social and cultural development, and student health services). If IPEDS data are to be better used for understanding instructional spending, the reporting format would need to be adjusted so that marketing and recruitment dollars were not reported under the category of student services.

This report has shown that the data currently available through IPEDS reveal important variation across higher education institutions in their spending on instruction. Despite limitations, these data could serve as a helpful resource for consumer information and accountability initiatives for two reasons. First, no superior alternative form of publicly available data currently exists, so a choice to ignore IPEDS data is a choice to ignore expenditure data completely. Second, individual institutions have the ability to explain why their instructional expenditure ratios are unduly low and the ability to correct data in the next version of IPEDS if the low figures reflect incorrect reporting. Higher education institutions could benefit from greater attention

to spending on instruction and further contemplation of whether or not they are properly directing resources to that core function.

This report has also highlighted major limitations in the data that are currently available. Any initiative that sought to improve data quality and use would initially face basic questions regarding the exact constructs to be measured and their eventual interpretation. This report closes by examining five of those questions.

Question 1: What types of spending should be counted as instruction? (What should go in the numerator?)

This report presented two different numerators that could be viewed as bounds for the concept of instruction. The INSTR measure is relatively pure, focusing on expenditures that directly relate to instruction that takes place within formal coursework. In contrast, the education and related (E&R) measure is expansive, including a wide range of measures that could be related to or support instruction. The proper measure to use, whether it be INSTR, E&R, or some measure in between, would depend upon the desired definition of instruction. This report did not seek to provide a definitive definition, but instead sets the stage for future discussions that could provide such a definition. Such discussions would consider questions about spending that relates to learning that takes place outside of formal coursework, resources that support instruction but do not play a direct role, services that enhance students' general well-being, and other items.

Question 2: What resources are collected for instruction? (What should go in the denominator?)

The two denominators presented in this report should not be viewed as bounds, as neither measure was as expansive as the E&R measure. For example, the measures used in this report capture private gifts and endowment income that is restricted to providing financial aid awards to students but do not capture other forms of private gifts and endowment income that were provided with instruction in mind. Given the structure of the IPEDS Finance Survey, an attempt to capture these latter forms of gift and endowment revenues

would lead to potential double-counting of the former types of revenues. So, existing data limitations lead researchers to play a game of whack-a-mole, where adjustments that correct one imperfection will lead to the creation of a new imperfection.

This game would be easier to play if we had a clear understanding of which resources should be viewed as potential sources of funding for instruction. This topic raises a range of questions. For example, if a higher education institution generates commercial revenue via entrepreneurial activities, should those dollars be directed toward instruction? Is the education share measure employed in this report a good guide for the allocation of these revenues as well as other forms?

Question 3: What values for spending ratios signal an improper level of spending on instruction?

This third question cannot be addressed until after answers are provided for the first two questions. If the definition of instruction becomes more expansive, expectations for spending ratios will naturally rise. Determining the proper expectations for any set of definitions, however, will not be a straightforward task. No clear boundary point exists, so any interpretation of spending ratios should be conducted with the proper level of humility.

The precise identification of ratio values that signify insufficient spending on instruction is beyond the scope of this report. Some general comments can be made, however. For ratios with INSTR in the numerator, one could raise concerns about schools with figures below 0.20. Less than 5 percent of schools fall below the 0.20 ratio, and one could reasonably expect that at least $1 of every $5 collected should go toward instruction. In contrast, one could view ratios above 0.50 as appropriate given the range of non-instructional expenditures that must be considered. The proper interpretation of the remaining range of values (0.20–0.50) is less clear.

Question 4: Should spending ratios be interpreted differently across different contexts?

The economics of higher education institutions are such that organizational cost structures will vary by the size, scope, and mission of the organization. For example, Table 5 highlighted differences in cost structure relating to the size of the higher education institution and the share of the institution's students that are enrolled exclusively online. In general, researchers have documented the presence of economies of scale and economies of scope by describing how unit costs fall as schools increase their enrollment or expand their range of activities.[12] Unit costs fall especially rapidly when schools with very low enrollments grow, so care must be taken when interpreting ratios for low enrollment schools.

Comparison between different schools would need to account for differences between institutions in size, scope, and mission. For example, Table 5 highlighted differences in cost structure relating to the size of an institution and the share of the institution's students that are enrolled exclusively in online classes. Such differences should be expected due to the presence of economies of scale and the differences between face-to-face and online education in regards to their underlying cost structures.[13]

The most daunting complexities pertaining to issues of scope relate to the joint production of instruction and research. For example, institutional researchers have no clear guide for determining the share of faculty salary expenses to be assigned to instruction and the share to be assigned to research, and crude approximations are typically used. A research institution seeking to demonstrate a commitment to their students could select approximations that lead to inflated measures of instructional expenditures.

A growing literature is examining how cost structures vary between face-to-face and online education.[14] The production of online education is fundamentally different due to the unbundling of the faculty role and the use of online program managers. The unbundling of the faculty role means that non-faculty personnel such as instructional designers and multimedia specialists play much larger roles in the development and delivery of online education than in face-to-face education. Online program managers—which help higher education institutions bring programs online and sustain them in return for a share of tuition revenue—provide services that were historically provided in-house. Because IPEDS reporting classifications and the instructions provided to data reporters were designed with face-to-face instruction in mind, further attention to the complexities associated with online education is needed.

Question 5: If spending ratios were used for consumer information and accountability purposes, would higher education institutions respond strategically in undesired ways?

Campbell's law highlights a key concern that would complicate any effort to use instructional spending ratios for consumer information or accountability initiatives:

> The more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social pressures it is intended to monitor.[15]

This concern is especially relevant for instructional spending measures because those reporting data for colleges and universities have discretion when allocating funds across categories. For example, instructional technology funds can be allocated across function, and no exact and universal method likely exists for determining what share of IT spending is related to instruction and what share is related to other activities.

These concerns cannot be fully eliminated, as they are a natural byproduct of the joint production that occurs within colleges and universities. They can, however, be reduced by improvements to the IPEDS finance survey and our understanding of the reporting procedures employed by colleges and universities. In a 2017 report, researchers Tammy Kolbe and Robert Kelchen provide an example of how researchers can support improvement efforts by surveying key actors and proposing changes to existing surveys.[16]

Author

Dr. John J. Cheslock is is an associate professor in the Education Policy Studies department and senior research associate in the Center for the Study of Higher Education at the Pennsylvania State University.

Notes

1 Gordon Winston, "Hostility, Maximization, and the Public Trust," Change: *The Magazine of Higher Learning* 24, no. 4 (1992): 20–27.

2 IPEDS survey materials can be found at https://surveys.nces.ed.gov/ipeds/VisResults.aspx?mode=results.

3 NACUBO advisory materials can be found at https://www.nacubo.org/Topics/Accounting/Advisory-Reports.

4 When schools do not separately account for information technology resources, the information technology costs associated with instruction, research, and public service are classified as academic support and the remainder as institutional support.

5 "Metrics for Improving Cost Accountability," Delta Cost Project, 2009, https://deltacostproject.org/sites/default/files/products/issuebrief_02.pdf.

6 For these categories and all categories, I am assuming that the expenditures are appropriate and that funds are not being wasted due to mismanagement or other causes.

7 For-profit institutions do not distinguish between restricted and unrestricted institutional grants, so the unrestricted institutional grants variable listed in Appendix Table 1 for for-profit institutions simply reflects total institutional grants. Because for-profit institutions do not receive donations that are restricted to specific activities, their institutional grants are unrestricted in practice.

8 Ron Allan, Lucie Lapovsky, and Loren Loomis Hubbell, "Financial Aid: Does It Matter Whether It's funded?" *Business Officer Magazine* 49, no. 1 (2005): 48–51.

9 Ozan Jaquette and Edna Parra, "The Project with the Delta Cost Project Database," *Research in Higher Education* 57, no. 5 (2016): 630–51

10 Several institutions have extremely high ratios that unduly influence computed means. Consequently, medians, rather than means, will be used to describe the central tendency of the data.

11 A small set of schools—less than 1 percent—have values for the denominator that are zero or negative. For these cases, their ratio could be viewed as approaching infinity. They are included in the analysis and were given an arbitrary ratio of 9,999 that far exceeds the observed values for the 99th percentile.

12 John Cheslock, Justin Ortagus, Mark Umbricht, and Josh Wymore, "The Costs of Producing Higher Education: An Exploration of Theory, Evidence, and Institutional Policy," in *Higher Education: Handbook of Theory and Research* 31, ed. Michael Paulson (Dordrecht, The Netherlands: Springer, 2016).

13 Ibid.

14 Ibid.

15 Donald Campbell, "Assessing the Impact of Planned Social Change," *Evaluation and Program Planning* 2, no. 1 (1979): 67–90.

16 Tammy Kolbe and Robert Kelchen, "Identifying New Metrics Using IPEDS Finance Data," National Postsecondary Education Cooperative, 2017, https://nces.ed.gov/ipeds/pdf/npec/data/NPEC_Paper_New_IPEDS_FinanceMetrics_2017pdf.

Appendix:
Examining Instructional Spending for Accountability and Consumer Information Purposes

FEBRUARY 28, 2019 — JOHN J. CHESLOCK

Appendix Table 1: Variables Utilized from the IPEDS Finance survey			
Account Standard	GASB	FASB	FASB
Primary institutional type	Public	Private Nonprofit	Private For-Profit
Instructional expenditures	F1C011	F2E011	F3E011
Student services	F1C061	F2E051	F3E03B1
Academic support	F1C051	F2E041	F3E03A1
Institutional support	F1C071	F2E061	F3E03C1
Research	F1C021	F2E021	F3E02A1
Public service	F1C031	F2E031	F3E02B1
Net tuition and fees	F1B01	F2D01	F3D01
Discounts and allowances applied to tuition and fees	F1E08	F2C08	F3C06
Unrestricted institutional grants	F1E06	F2C06	F3C04
Local appropriations	F1B12	F2D04	F3D03C
State appropriations	F1B11	F2D03	F3D03A