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Opportunity Lost:

Net Price and Equity at Public Flagship Institutions

TECHNICAL APPENDIX

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This research project has three components:

- 1) **Calculating Student Profiles:** Using nationally representative data adjusted for the cost of living across all 50 states, we created profiles of five typical students from a range of backgrounds.
- 2) **Net Price Calculators:** We gathered the cost of attendance, financial aid, and net price data from 50 flagship institutions, based on output from each institution's online net price calculator.
- 3) **Lumina Foundation's 'Rule of 10' Affordability Benchmark:**¹ This is used to determine affordability thresholds for each student profile at each flagship institution.

CALCULATING STUDENT PROFILES

For this project, using nationally representative data, we produced five student profiles for each of the following categories:

- 1) Dependent: Low-Income
- 2) Dependent: Middle-Income
- 3) Dependent: High-Income
- 4) Independent: Without Dependents
- 5) Independent: With Dependents

We used National Center for Education Statistics' *National Postsecondary Student Aid Study* (NPSAS:2016)² data for students who are attending college full-time, along with other nationally representative data. (For a description of the sources and variables used, see **Table 1** on page 5.)

The median income for parents of dependent students within a given quintile is used for family income. For independent students, the median income for independent students with or without dependents is used. Other factors considered for these profiles include the average age of students, parents' education level, marital status of both parents and students, ACT/SAT scores, family size, homeownership status, and more.

In order to make monetary values (e.g., income, assets, savings, etc.) representative of the current economic conditions within each state, we adjusted all values to 2018 dollars using the Consumer Price Index and then applied the State Higher Education Executive Officers association's state-level Cost of Living Index (COLI) adjustments³ to produce 50 unique state-level economic profiles for each student type.

NET PRICE CALCULATORS

Each student profile was entered directly into each institution's online net price calculator. These calculators, which are required by federal law,⁴ provide students with estimates of the total cost of a single year of college, as well as the projected amount of any grants or scholarships they qualify for based on their income, academic performance, family structure, and other factors. The result is an estimate of that student's first-year "net price" or the total amount needed to cover tuition and fees and all other living expenses after grants and scholarships are taken into consideration.

On top of these calculated observations, we assume the following for all student profiles:

- 1) All students are in-state residents for each institution.
- 2) All students are about to begin their first year of college, full-time.
- 3) Dependent students will live on campus (all flagships offer on-campus housing). All independent students live off campus but not with family.
- 4) None of the students use military or veteran's benefits to assist in paying for college.

The results were transcribed and then separated into different categories as described below.

Cost of Attendance (COA). The cost of attendance represents the total cost of college before any type of aid is applied. COA is the sum of:

- 1) Tuition and fees—mandatory costs for attending classes.
- 2) Room and board—costs for housing and meals.
- 3) Other—while some net price calculators break down the other costs associated with attending school into more refined categories, for consistent comparisons we combine these costs into a single catch-all category for non-tuition or non-room-and-board expenses.

In some cases, COA was reported as a single lump sum, or these three categories were combined in other ways. In these cases, we used data for that institution as reported to the [Integrated Postsecondary Education Data System \(IPEDS\)](#) to calculate the breakdown between each type of expense.

Grant Aid. The value of any financial aid offered to prospective or current college students that does not need to be paid back is considered grant aid. Grant aid traditionally comes from three sources: the federal government; state governments; or institutions. Grant aid can be need-based or non-need-based (sometimes referred to as “merit based”), or some combination of the two. While some net price calculators specify the name of the grant, few included the source of the funding or the terms for its receipt. Therefore, we were not always able to effectively distinguish between state and institutional aid or between need-based and other types of grants. In some cases, grant aid from federal sources was also not reported separately, and in these cases the catch-all category of “uncategorized aid” is used.

Net Price. To calculate the net price of an institution, grant aid is subtracted from the cost of attendance. The remaining net price represents the costs that a student or student’s family will have to pay through savings, loans, or by other means to cover the full cost of attendance. Loans from federal or other sources are not included in our net price calculation.

As a secondary check, we sent each recorded output to the respective financial aid and institutional research offices at each flagship institution. Some institutions flagged errors in their net price calculator output. We evaluated all responses on a case by case basis to ensure accuracy and methodological consistency. As a result, we adjusted values for the following institutions:

- 1) University of Idaho—adjusted “other” cost values, which impact cost of attendance.
- 2) University of North Carolina—added a \$3,000 need-based Carolina Covenant Grant to low-income and independent students.
- 3) Ohio State University—minor adjustments of cost and aid values.
- 4) University of Tennessee—added a \$3,000 merit grant.
- 5) University of Wisconsin—minor adjustments of aid values, moved some aid from “state aid” to “institutional aid.”

Of these adjustments, only the University of North Carolina’s \$3,000 grant had any significant impact on the findings of this report, moving the institution from slightly unaffordable to affordable for low-income dependent students.

LUMINA FOUNDATION'S 'RULE OF 10' AFFORDABILITY BENCHMARK

This benchmark is based on the following rules:

The college student's household should be able to save 10 percent of their discretionary income over a period of 10 years before college. Discretionary income represents total income minus 200 percent of the *2018 Federal Poverty Guideline*.⁵ By basing the Rule of 10 on discretionary income, it assumes that students from families below 200 percent of the federal poverty line (FPL) have no family finances available for college, meaning that for low-income students profiled here, an institution is only affordable if the net price can be covered by earnings from work.

While attending college full-time, the student should be able to maintain working a minimum-wage job for 10 hours per week (an estimated 500 hours per year). For this project, we utilized up-to-date minimum wage data from the *National Conference of State Legislatures*.⁶ For states where the state-level minimum wage is lower than the federal minimum wage, we replaced the value with the federal minimum wage of \$7.25. For states where the minimum wage is higher or lower depending on the size of the employer, we utilized the lower of the two minimum standards. In Nevada, specifically, we used the state's higher minimum wage because we assume that part-time employees do not receive health benefits from their employer, and the lack of health care coverage would qualify them for the higher minimum wage.

For a college to be affordable, the combination of these savings and the student's work income should be enough to cover the entire cost of a four-year degree. For students pursuing a bachelor's degree and completing in four years, this benchmark suggests that annual part-time earnings plus 25% of the 10 years of savings (or an equivalent amount) should be able to cover all non-tuition and tuition expenses associated with a single year of school.

Therefore, for a college to be considered affordable, the following must be true:

$$(\text{Net Price}) \leq \frac{((\text{household income} - (2 * \text{FPL})) * 0.1 * 10)}{4} + (\text{min. wage} * 500 \text{ hours})$$

Example: A student at the University of Florida is from a middle-income family of four. Their parents earn \$64,649 per year. The federal poverty level for a family of four is \$25,100. Therefore, the family has \$14,449 in discretionary income per year. This means if they save 10% over 10 years, the family can put \$14,449 towards the cost of college, or \$3,612 each year for four years.

$$\frac{((\$64,649 - (2 * \$25,100)) * 0.1 * 10)}{4} = \$3,612$$

The student also works a minimum wage job for 10 hours per week (or 500 hours per year) while in college. The minimum wage in Florida as of the time of this analysis is \$8.46/hour. In one year, the student will earn:

$$(\$8.46 * 500) = \$4,230$$

Therefore, if a year of college at the University of Florida is more expensive than \$7,842 (\$3,612 + \$4,230), it is unaffordable for a middle-income family in the state. The net price is \$15,309 for this student type—therefore the University of Florida is unaffordable, and the student will need to consider alternative options such as student loans to cover the remaining \$7,467.

Table 1: Student Profiles

Unless otherwise noted, all values are the average for students enrolled full-time in a given income and dependency category.

VARIABLE	SOURCE	LOW-INCOME DEPENDENT	MIDDLE-INCOME DEPENDENT	HIGH-INCOME DEPENDENT	INDEPENDENT: NO DEPENDENTS	INDEPENDENT: HAS DEPENDENTS
Parent income quintile	NPSAS	Bottom	Middle	Top	N/A	N/A
Income (AGI)* ^{A7}	NPSAS	\$14,655	\$65,779	\$177,430	\$14,794	\$25,327
Age+ ⁸	NPSAS	19	19	19	24	24
Marital status ^{A9}	NPSAS	Single	Married	Married	Single	Single
Parent 1 education ¹⁰	NPSAS	Vocational Training	Associate Degree	Bachelor's Degree	N/A	N/A
Parent 2 education ¹¹	NPSAS	N/A	Some College, No Degree	Bachelor's Degree	N/A	N/A
High-school GPA~ ¹²	NPSAS	3.8	3.9	3.9	N/A	N/A
ACT composite~ ¹³	NPSAS	24	26	28	23	23
SAT composite~ ¹⁴	NPSAS	1100	1180	1240	1002	1070
Household college students ¹⁵	NPSAS	1	1	2	1	1
Household size ¹⁶	NPSAS	4	4	4	1	3
SNAP/FRPL ¹⁷	Child Nutrition Programs: Income Eligibility Guidelines	Yes	No	No	Yes	Yes
Tax form ^{A18}	2017 instructions for form 1040	1040A	1040A	1040A	1040EZ	1040A
Taxes paid* ^A	Manual completion of tax form	\$0	\$8,882	\$27,665	\$0	\$0
Tax credits* ^A	Manual completion of tax form	\$6,594	\$1,060	\$0	\$0	\$4,717
Retirement contributions* ^{A19}	Vanguard	\$0	\$1,973	\$10,646	\$0	\$0
Savings* ^{A20}	Survey of Consumer Finances (Table 6)	\$636	\$4,804	\$40,350	\$636	\$1,802
Investments* ^{A21}	Survey of Consumer Finances (Table 7)	\$0	\$0	\$358	\$0	\$0
Homeowner ^{A22}	American Housing Survey table creator	No	Yes	Yes	No	No
Home purchase year ^{A23}	American Housing Survey table creator	N/A	2005	2007	N/A	N/A
Home price* ^{A24}	American Housing Survey table creator	N/A	\$129,320	\$275,600	N/A	N/A
Home value* ^{A25}	American Housing Survey table creator	N/A	\$190,800	\$381,600	N/A	N/A
EFC (Federal)* ²⁶	College Board's EFC calculator	0	\$6,102	\$23,669	\$127	\$360

* All financial values are adjusted for the cost of living in a state, using the State Higher Education Executive Officers' state-level Cost of Living Index (COLI) adjustments. This means that for states with higher costs of living, the financial variables used in the net price calculations are higher, while in states with low costs of living, families are assumed to have fewer resources.

^A Where indicated, values for dependent students refer to the student's parent/guardian(s), while values for independent students refer to the students themselves.

+ Age reflects the average age at the time a student starts their postsecondary education.

~ Because flagships often have higher admissions standards than other public institutions, we use the average test scores for students attending very selective institutions.

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- 4 20 USC 1015a(h). Retrieved from <http://www.gpo.gov/fdsys/pkg/USCODE-2015-title20/pdf/USCODE-2015-title20-chap28-subchapl-partC-sec1015a.pdf>; U.S. Department of Education. (2016, January 28). Net Price Calculator Information Center. Retrieved from http://nces.ed.gov/ipeds/section/net_price_calculator
- 5 U.S Department of Health and Human Services. (n.d.). 2018 Poverty Guidelines. Retrieved from: <https://aspe.hhs.gov/2018-poverty-guidelines>
- 6 National Conference of State Legislatures. (January 2019). State Minimum Wages, 2019 Minimum Wage by State. Retrieved from: <http://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx>
- 7 IHEP analysis of 2015–16 data from the National Postsecondary Student Aid Study (NPSAS:16), a product of the National Center for Education Statistics, U.S. Department of Education. Computation by NCES PowerStats Version 1.0 on July 2, 2019. Variables: ENRSTAT, DEPEND2, CINCOME, and CAGI. Weight: WTA000.
- 8 IHEP analysis of 2015–16 data from the National Postsecondary Student Aid Study (NPSAS:16), a product of the National Center for Education Statistics, U.S. Department of Education. Computation by NCES PowerStats Version 1.0 on July 2, 2019. Variables: CINCOME, AGEPSE, ENRSTAT, DEPEND2. Weight: WTA000.
- 9 IHEP analysis of 2015–16 data from the National Postsecondary Student Aid Study (NPSAS:16), a product of the National Center for Education Statistics, U.S. Department of Education. Computation by NCES PowerStats Version 1.0 on July 2, 2019. Variables: PMARITAL, CINCOME, SMARITAL, ENRSTAT, DEPEND2. Weight: WTA000.
- 10 IHEP analysis of 2015–16 data from the National Postsecondary Student Aid Study (NPSAS:16), a product of the National Center for Education Statistics, U.S. Department of Education. Computation by NCES PowerStats Version 1.0 on July 2, 2019. Variables: PARMALED, CINCOME, ENRSTAT, DEPEND2. Weight: WTA000.
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- 12 IHEP analysis of 2015–16 data from the National Postsecondary Student Aid Study (NPSAS:16), a product of the National Center for Education Statistics, U.S. Department of Education. Computation by NCES PowerStats Version 1.0 on July 2, 2019. Variables: CINCOME, ENRSTAT, DEPEND2, HSGPA. Weight: WTA000.
- 13 IHEP analysis of 2015–16 data from the National Postsecondary Student Aid Study (NPSAS:16), a product of the National Center for Education Statistics, U.S. Department of Education. Computation by NCES PowerStats Version 1.0 on July 2, 2019. Variables: TEACTDER, CINCOME, ENRSTAT, DEPEND2. Weight: WTA000.
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- 24 Ibid.
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