

Quantifying the impact of excess capacity in higher education

October 2020





Executive summary

This report (the Report) has been prepared by Ernst & Young LLP (EY), for the sole purpose of assisting Lumina Foundation in assessing the current supply-demand landscape in higher education.

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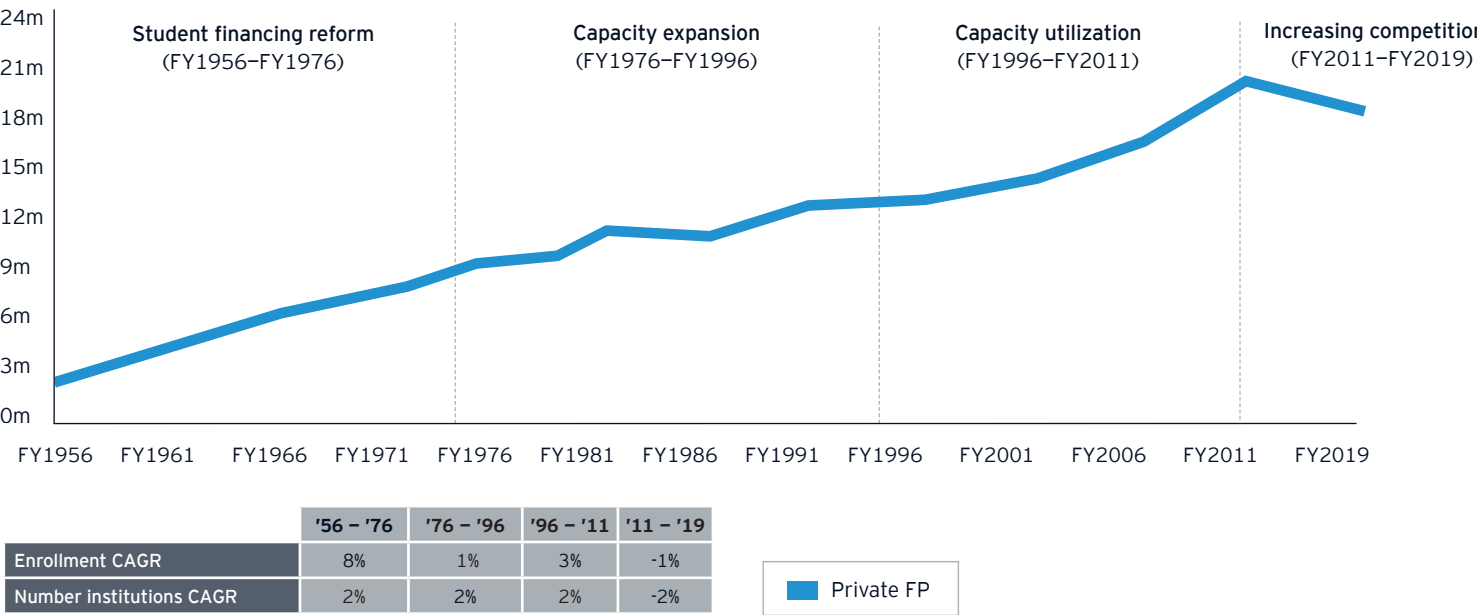
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The US higher education sector has faced numerous operating challenges for some time. Flat enrollments, intense competition over students, increasing tuition discounting, rising costs and shifting demand preferences were among the myriad challenges US institutions have been managing. The 2020 COVID-19 pandemic accelerated and brought increased visibility to many of these challenges. Even before the onset of the pandemic, approximately one in five private institutions was facing

substantial financial challenges. Up until the Great Recession in 2008, the higher education sector had experienced strong periods of enrollment growth and institution openings as it expanded capacity to meet the demand of new students each year. As the US began to recover from the Great Recession, growth turned into stagnation. Enrollments dipped. Previously built-out “seats” at institutions became unfilled capacity. The cost of education on a per-student basis continued to rise.

Figure 1: Higher education total enrollment FY1956–FY2019 (“FP” refers to for-profit colleges)²



¹ See EY-Parthenon's *The other looming educational debt crisis: Institutional debt and safeguarding the interests of students: A new student-centered financial health metric for higher education institutions*, https://www.ey.com/en_us/strategy/looming-educational-debt-crisis
² IPEDS



As demographic challenges escalated and competition for students increased, institutions attempted to offer a broader set of programs and student services to attract students, increasing both academic and operational costs in the process. The cumulative impact of these trends was visible in the growing financial fragility of the higher education sector. If this fragility continues or deepens, which is likely as a result of continued demographic change but also because of the unprecedented level of uncertainty and volatility introduced by COVID-19 into the market, **it could threaten the very foundation on which the higher education system in this country was created – to provide access to quality education to its people, regardless of age, income level, race, ethnicity, socioeconomic status or gender.**

A number of factors, both external and internal, affect a postsecondary institution's financial health. External factors include macro elements such as the level of demand compared to supply (overall, by geography, by subsector) and perceived value of education (e.g., as measured by public perception and ability of higher education institutions to maintain “pricing power” over time). Internal factors include an individual institution's ability to evolve and adapt in changing times, differentiate in a crowded market, and adjust costs to match changes in revenues, to name just a few.

This paper, written by EY-Parthenon and made possible through the engagement and support of the Lumina Foundation, focuses on the macro factor of balance between supply and demand, analyzes how this balance has changed over time, and attempts to quantify the level of over (under) utilization in the higher education sector over time. For a full description of the methodology, please refer to the Appendix.

³ EY-Parthenon is part of the broader Ernst & Young LLP organization.
⁴ IPEDS.

The question being asked before the pandemic, “Is there excess capacity in the US higher education sector, and what is the potential cost of this excess capacity and subsequent impact on students, especially underrepresented students?” is increasingly relevant during the COVID-19 era, with so much of higher education operating in a remote mode of delivery. Key findings of our analysis include:

Capacity growth of **26%** dwarfs enrollment growth of **3%** (FY2009-FY2019)

EY-Parthenon (EYP) developed a capacity calculation approach that takes into account both enrollment capacity and instructional capacity. The EYP Capacity Calculation estimates that total capacity, across all sectors of higher education, has increased approximately 26% cumulatively between FY2009 and FY2019. Enrollment has increased 3% during the same period. This may indicate a propensity for the higher education sector to overbuild and over-hire.

75% usage implies excess capacity of **3 million to 5 million** seats

An analysis of the dynamics of supply and demand in higher education indicates that there is excess capacity in the sector. Today's demand for higher education seats is roughly equivalent to 14.8 million full-time equivalent (FTE) enrollments (FY2019). The EYP Capacity Calculation estimates total existing capacity at 19.8 million FTE enrollments. With a target of reaching 90% to 100% usage in the system overall, excess capacity today could range from 3 million to 5 million seats.

The cost of excess capacity could be as high as **\$50 billion** annually

Excess capacity costs in the US post-secondary system range from \$27 billion to \$51 billion annually (using 90%-100% utilization targets). At the upper end, this is roughly equivalent to the amount of **new** student loan debt taken out each year. This in turn is likely to create pressure to increase pricing (or, at a minimum, makes it difficult to reduce pricing substantially) and could negatively impact students' access to affordable quality education offerings.



- To address this excess capacity and decrease costs per student, states/systems/institutions have three potential options:
- 1. Grow enrollment and utilization:** expand to serve nontraditional learners (e.g., adult learners or certificate-seekers) and meet changing workforce demands.
 - 2. Share more:** groups of institutions can create partnerships to share academic programs or back-end services to drive efficiencies and reduce costs.
 - 3. Take capacity offline:** merge with other institutions or close programs, schools, or entire institutions, thus reducing overall capacity and increasing utilization.

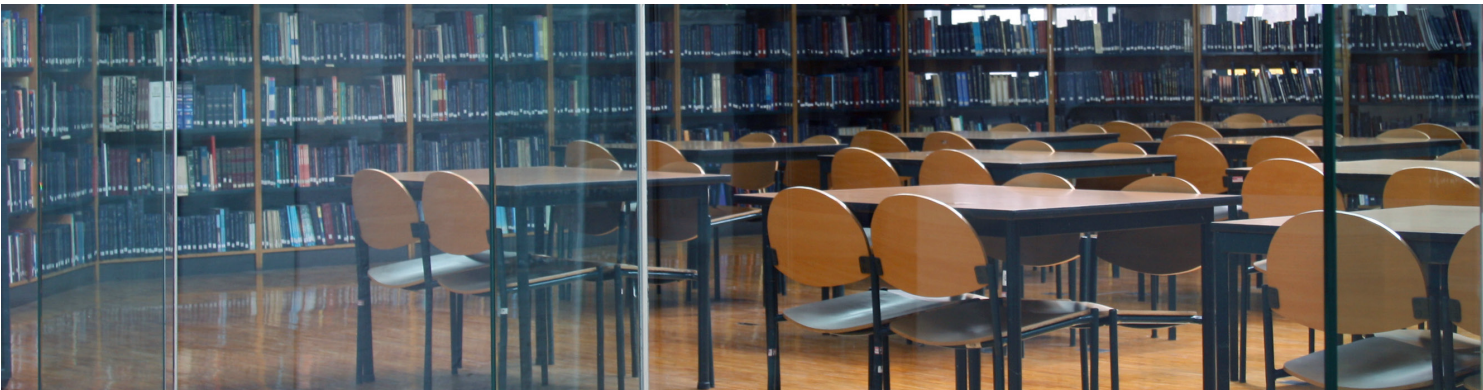
Part 1:

Rising excess capacity and declining utilization

Examining supply and demand balances in the higher education sector has become an increasingly relevant way to evaluate sector health over the past decade. As enrollments have declined, many institutions have continued to build capacity in the form of additional faculty, student services and physical space. While academic programs have been added in response to targeted student or employer demand, the additions often come without paring back the overall number of programs. This paper posits that excess capacity does exist in the sector overall, that it may be more pronounced in certain subsectors, and that there are financial consequences – to both institutions and learners – associated with sustained excess capacity, which are ultimately passed on to students. Costs associated with excess capacity often result in increased tuition rates as institutions attempt to balance budgets in the face of rising operating costs.

Capacity in the higher education sector can be analyzed through two lenses – peak enrollment capacity and peak instructional capacity – which then sum up to a sector-wide view of capacity. For the purposes of this analysis, the following definitions are applied:

- **Peak enrollment capacity** is the maximum number of full-time equivalent students that any given institution has served in the past in any given year. In this definition, it is assumed that institutions typically do not eliminate teaching space, dormitory space or any other physical space as their enrollments shrink and that they hold onto this physical space to serve the current numbers of students enrolled.



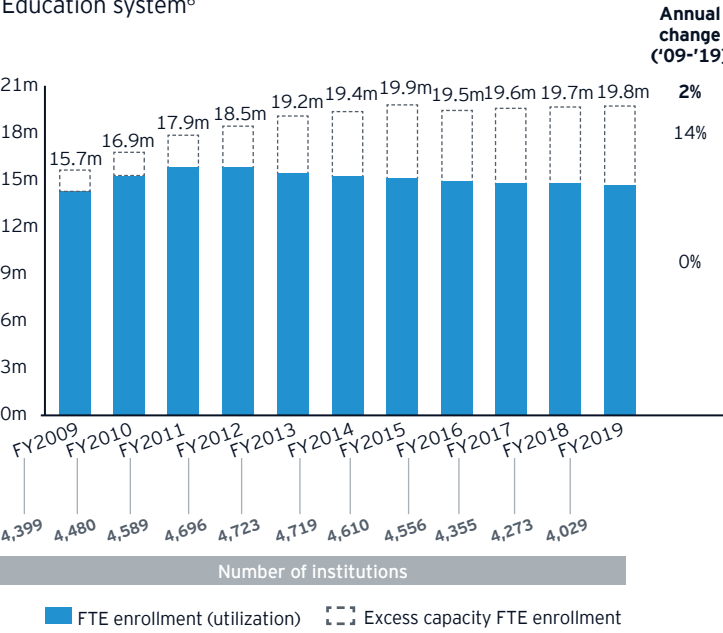
- **Peak instructional capacity**, which is defined through a faculty and instructional staff lens, is calculated by multiplying an institution's current instructional faculty by its maximum previously demonstrated student-faculty ratio. Across the higher education landscape, institutions have continued to hire instructional faculty even as enrollments have declined, highlighting changes or potential inefficiencies in instructional models that resulted in declining student-faculty ratios over time. This instructional capacity lens provides a method by which to measure how many students an institution could serve if it were operating at its most efficient (based on maximum historical student-faculty ratio) across all academic areas.

The methodology and analysis described above led to the creation of the EYP Capacity Calculation. For each institution in the data set, the EYP Capacity Calculation identifies both the peak enrollment capacity and the peak instructional capacity, then takes the larger of the two metrics as the ultimate measure of capacity at a given institution. Said differently, the EYP Capacity Calculation assumes an institution can serve at maximum of either the peak number of students whom it has previously served and for whom it has built up infrastructure or the number of students its instructional faculty could theoretically teach given past student-to-faculty ratios.

Applying the EYP Capacity Calculation to two-year and four-year institutions in the data set yields the following results in the longitudinal analysis:

- Estimated total higher education sector capacity of 15.7 million full-time equivalent enrollments in FY2009.
- Estimated total capacity of 19.8 million full-time equivalent enrollments in FY2019, representing a cumulative change of 26% between FY2009 and FY2019, or a change of over 2% per year.
- With full-time equivalent enrollments at 14.8 million in FY2019, there is an estimated excess capacity of approximately 5 million “seats” in the US higher education system today, implying that the higher education sector as a whole operated at about 75% utilization.
- Since FY2009, utilization of capacity within the higher education system has declined significantly, from approximately 90% utilization to approximately 75% utilization.⁵

Figure 2. Excess and utilized capacity in the US Higher Education system⁶



⁵ IPEDS and EY-Parthenon analysis
⁶ Ibid
⁷ Ibid

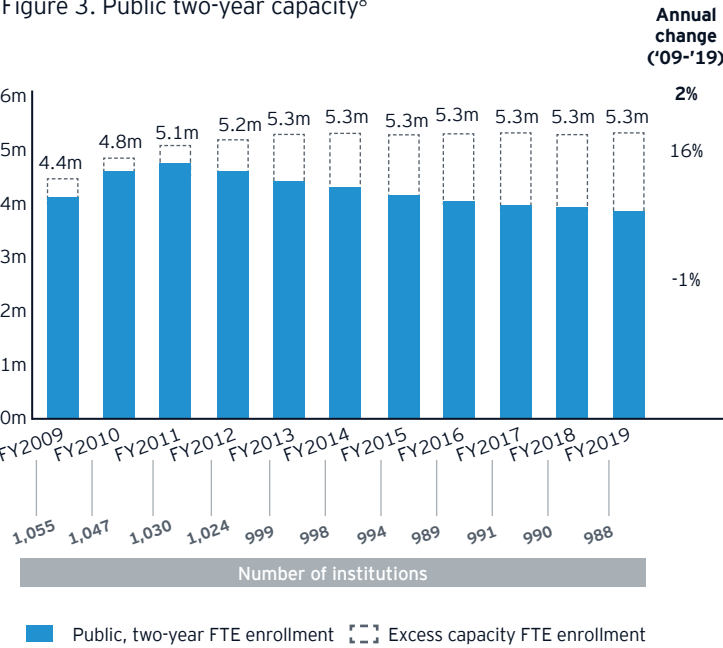
⁸ Ibid
⁹ Ibid



It is important to evaluate capacity utilization at the subsector level, given stark variances in utilization. This paper focuses primarily on three segments: (1) public two-year institutions, (2) public four-year institutions, and (3) private, not-for-profit four-year institutions. These three segments make up approximately 95% of enrollments in US higher education. The remaining segments, accounting for approximately 5% of enrollments, are private, not-for-profit two-year institutions and for-profit institutions.

1. Excess capacity is growing most rapidly within public two-year institutions, which operated at 73% utilization in FY2019,⁷ down from 93% in 2009. Although total capacity has remained relatively flat among public two-year institutions at approximately 5.3 million, enrollments in this subsector have declined more rapidly than in other subsectors since the Great Recession. However, it is important to note that this analysis does not account for non-credit enrollments at public two-year institutions, which likely affects utilization within the subsector.

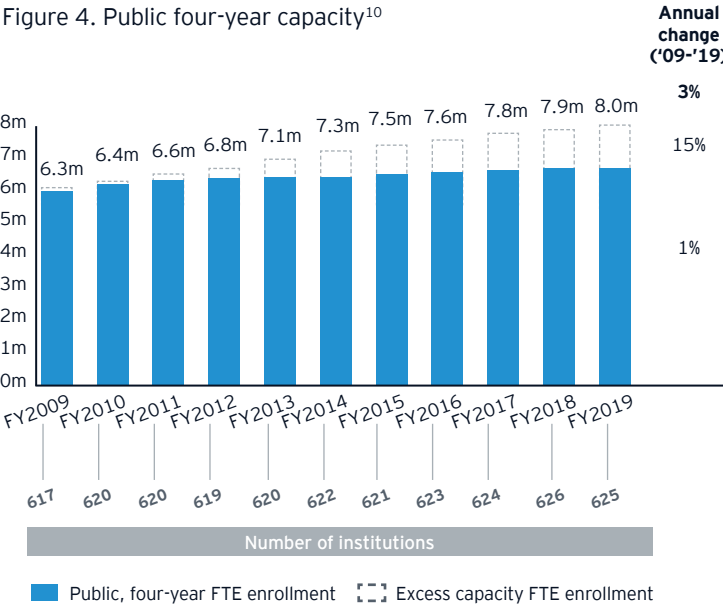
Figure 3. Public two-year capacity⁸



¹⁰ Ibid
¹¹ IPEDS and EY-Parthenon analysis
¹² Ibid. IPEDS does not break out online vs. hybrid vs. on-site modality prior to FY2013.

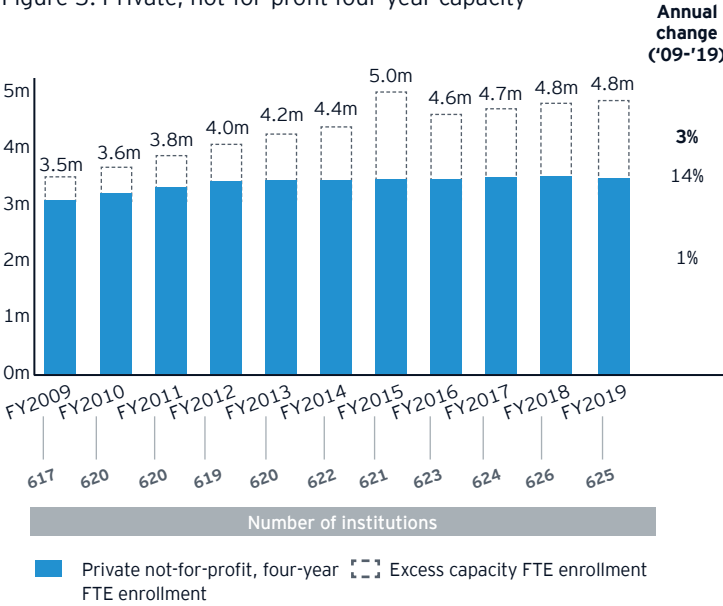
2. Public four-year institutions have the highest utilized capacity of the three segments, operating at 83% utilization in FY19. Capacity in these institutions has been expanding at approximately 2% per year since FY2009, outpacing enrollment growth of approximately 1% per year.⁹

Figure 4. Public four-year capacity¹⁰



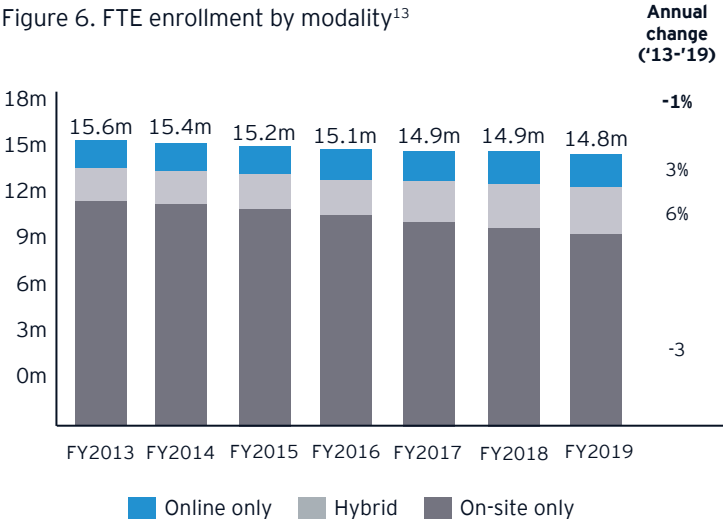
3. Finally, private, not-for-profit four-year institutions operated at an estimated 73% utilization in FY2019. Although this sector has experienced relatively flat enrollment growth at 1% per year, it has added a substantial amount of capacity, at about 12% per year, primarily due to increased instructional capacity.¹¹ Public institutions, on the other hand, are notably less likely to continue to hire faculty in the face of declining enrollments, thereby maintaining instead of growing their instructional capacity.

Figure 5. Private, not-for-profit four-year capacity¹²



The trend of online and hybrid modalities within the higher education sector becoming a larger share of total enrollments could further exacerbate the issue of excess capacity across the three subsectors, particularly as institutions continue to build their physical capacity, despite shifts in modality preferences.

Figure 6. FTE enrollment by modality¹³

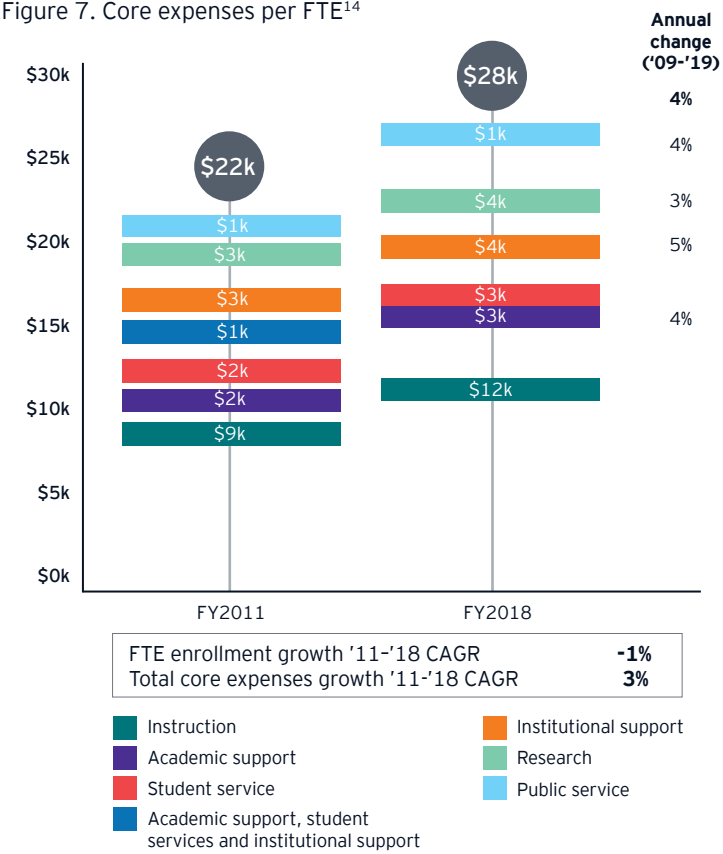


Part 2:

Cost implications of excess capacity

Overall growth in cost per student FTE: There are financial implications associated with institutions operating with excess capacity. Cost per student FTE has increased significantly over the past decade, across all subsectors in higher education. Primary drivers of this increased cost per student FTE are instructional costs and student service costs. These cost categories have increased at approximately 4% annually.

Figure 7. Core expenses per FTE¹⁴



Note: Given changes in IPEDS reporting, Academic Support, student services, and a small fraction of instructional support dollars were reported together in an “Academic Support, Student Services, and Instructional Support” bucket in FY2011 and were calculated as part of the Annual Change for instruction, Academic support, and Student Service (4%).

Relationship between utilization and cost per student FTE: A regression analysis was conducted to understand the relationship between utilization and cost per student FTE. The regression indicates that utilization and cost per student FTE have a negative correlation; as utilization of capacity decreases, costs per student tend to increase. A more detailed description of the methodology is included in the Appendix. Higher costs per FTE are in turn likely to translate into higher tuition rates as institutions attempt to use the pricing lever to assist with budget balancing.

Here is what the regression analysis uncovered by sub-sector:

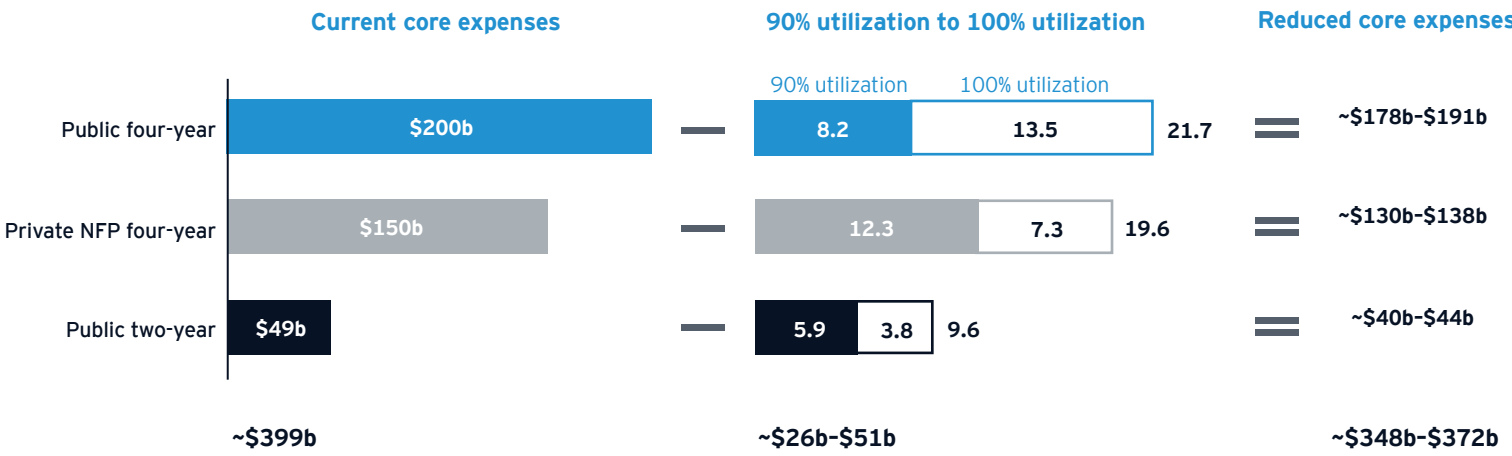
- 1 In the public two-year institution subsector, a 1% increase in utilization yields potential cost savings of approximately \$95 per student FTE:
- ▶ This implies that bringing the subsector up from 73% utilization to 90%-100% utilization could result in decreases of approximately \$1,500 to \$2,500 in cost per student FTE.
 - ▶ In aggregate, this could save the subsector approximately \$5.9 billion to \$9.6 billion.
- 2 In the public four-year institution subsector, a 1% increase in utilization yields potential cost savings of approximately \$205 per student FTE:
- ▶ This implies that bringing the subsector up from 83% utilization to 90%-100% utilization could result in decreases of approximately \$1,300 to \$3,300 in cost per student FTE.
 - ▶ In aggregate, this could save the subsector approximately \$8.2 billion to \$21.7 billion.
- 3 In the private, not-for-profit four-year institution subsector, a 1% increase in utilization yields potential cost savings of approximately \$210 per student FTE:
- ▶ This implies that bringing the subsector up from 73% utilization to 90%-100% utilization could result in decreases of approximately \$3,500 to \$5,600 in cost per student FTE.
 - ▶ In aggregate, this could save the subsector approximately \$12.3 billion to \$19.6 billion.

Figure 8. EY-Parthenon Lumina Capacity Index potential cost implications¹⁵

Institution sector	Utilization FY18	FTE students FY18	Current core expenses FY18	1% point increase in utilization results in per FTE savings of:	Core expenses per FTE at 100% utilization	Implied cost*savings at 100% utilization given reduce capacity
All title IV, degree granting	75%	14.9m	\$27.6k	_*	_*	_*
Two-year public	74%	5.3m	\$12.6k	-\$95	\$10.2k	~\$10b
Four-year or higher public	84%	7.9m	\$30.6k	-\$205	\$27.3k	~\$22b
Four-year or higher private not-for-profit	73%	4.8m	\$43.6k	-\$210	\$38.0k	~\$20b

Overall, within these three sectors, the higher education system could realize potential efficiencies in the **range of \$27 billion to \$51 billion if it were to operate at 90%-100% capacity**. Increased excess capacity has contributed to rising costs. Institutions across all major subsectors of higher education have struggled to reduce these costs in the face of flat to declining enrollments.

Figure 9. Total core expenses savings driven by elimination of excess capacity between 90% and 100% utilization



¹³ IPEDS and EY-Parthenon analysis. Private for-profit sectors did not break out Academic support, Student services, and Institutional support in FY2011.

¹⁴ IPEDS and EY-Parthenon analysis

Part 3:

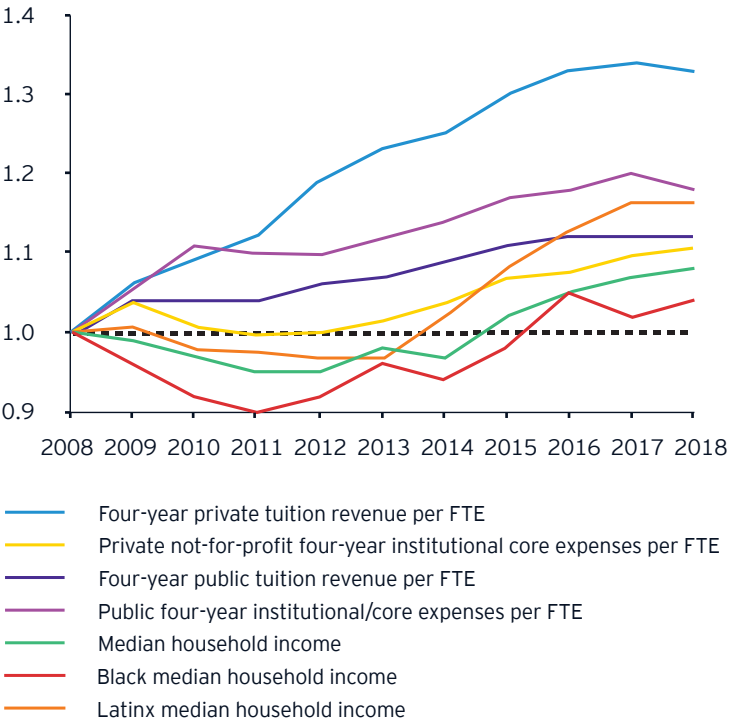
Impacts of rising costs on students

As the cost to educate a student continues to rise across the higher education sector, in part fueled by a reduction in utilized capacity, institutions have continued to raise tuition levels to meet increasing costs. (As an aside, COVID-19 may contain this practice somewhat by putting pressure on institutions to either freeze or reduce tuition and fees for instruction that is being delivered remotely.)

The bulk of growth in expenses has been passed on to learners – since we came out of the Great Recession (FY2011), tuition and fees have grown at approximately 2% annually, while core expenses have grown at approximately 3% during the same

time period. This constant upward pressure on tuition revenue is bound to affect college affordability. Should tuition and fee levels continue to rise, this trend can disproportionately affect students from disadvantaged backgrounds, across race, income and first-generation status. As shown in Figure 9, growth in cost per student has outpaced growth in median household income of both underrepresented minority students from Black and Latino families and students from low-income families, as well as median household income overall. If institutions continue to raise tuition and fees to offset cost increases, affordability may continue to be a challenge for these learners.

Figure 10. Change in household income, tuition revenue per FTE, and core expenses per student in 2008 dollars¹⁶



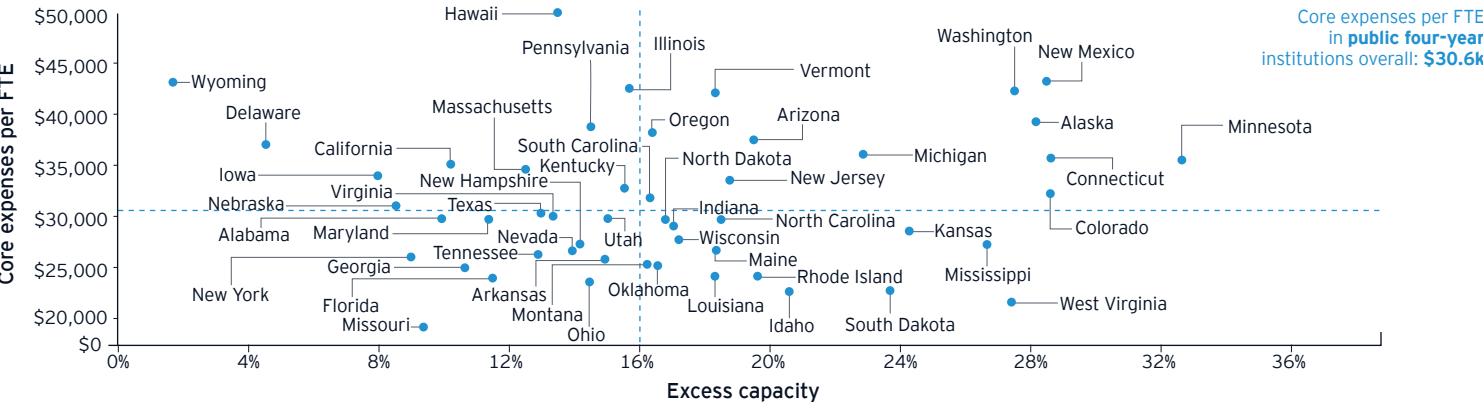
¹⁵ IPEDS and EY-Parthenon analysis
¹⁶ Ibid
¹⁷ Ibid



Furthermore, excess capacity and the cost to educate a student vary across states and higher education subsectors. In states that have institutions with lower utilization and higher core expenses per student FTE relative to national averages, raising

tuition and fees to offset cost increases will likely after continue to have a negative effect on affordability of education. These reductions in affordability may disproportionately impact learners in certain geographies and states.

Figure 11. Excess capacity and core expenses per FTE by state in public four-year institutions¹⁷



Part 4:

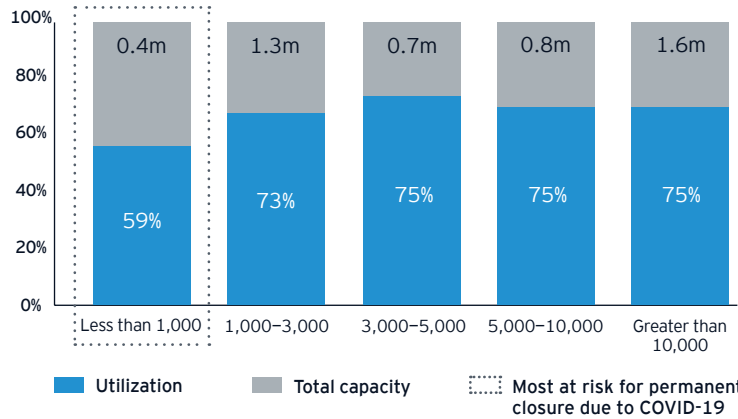
Impacts of COVID-19 on utilization

As mentioned earlier, COVID-19 is likely to exacerbate the financial fragility of the higher education sector by creating additional uncertainty about enrollments, putting additional pressure on pricing, and reducing income from room and board and other auxiliaries such as athletics.

COVID-19 is also likely to have a disproportionate impact on small, private institutions with under 1,000 FTE students. Smaller institutions, in particular private, not-for-profit four-year institutions, are most at risk for either a merger or permanent closure due to COVID-19. They have an overall utilization of 59%, which is well below the higher education average of approximately 75% and the four-year private institution average of 73%. Mergers and closures may offer a correction to the overall sector by improving overall utilization as displaced students relocate. However, depending on the geographic location of the closures, this may reduce accessibility for students, especially those from previously disadvantaged backgrounds, who may now need to travel farther to finish their degree. Additionally, any potential disruption in learning may

negatively impact some students' ability to graduate (because it increases likelihood of dropping out or running out of federal financial aid). It is important to consider the implications of displacement on student success, even as utilization in the sector overall may increase.

Figure 12. Utilization in private, NFP four-year institutions, by size bucket¹⁸



¹⁸ The Claremont Consortium is the central support organization for seven private higher education institutions located in Claremont, California.

Part 5:

Conclusion

Excess capacity in US higher education is a function of changes in both supply and demand. Underutilization of many institutions within higher education is increasing, driving financial consequences that negatively affect learners. To reverse this cycle of declining institutional health and growing cost of higher education in the US, supply and demand imbalances may need to be addressed:

- **Demand** for postsecondary education has shifted dramatically in recent years. Institutions can choose to diversify their mix of students and mix of offerings to meet the evolving needs of students and employers. The shifting demographics of today’s student creates a demand opportunity – over 35 million adults with some credits and no credentials – that can be accessed by removing barriers to re-entry and completion and leveraging existing assets to address the non-degree credential market (often in collaboration with the corporate sector or government).
- At the same time, postsecondary institutions in the US may consider addressing **supply-side misalignments** by strongly collaborating, partnering and consolidating. Collaboration can reduce costs and increase efficiencies in supply, ultimately benefiting the learners.

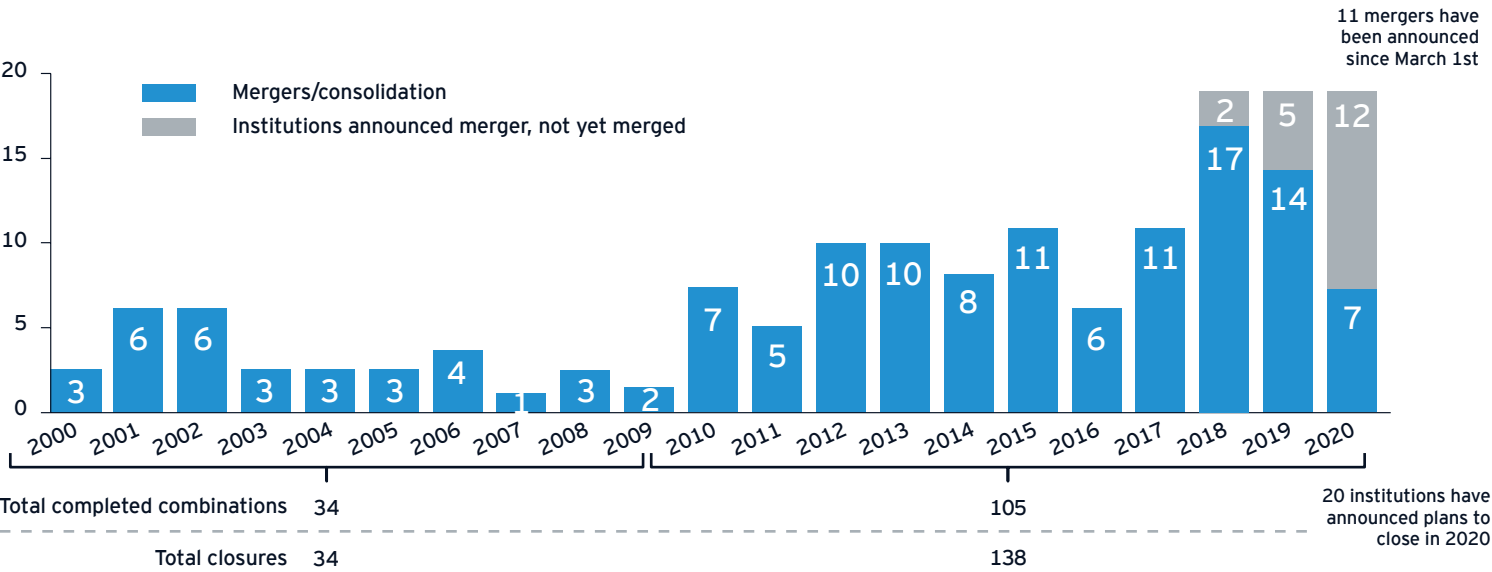
There are three key “levers” that institutions can pull and that state departments of higher education or policymakers can encourage to increase utilization: drive enrollments, decrease existing excess capacity, or engage in shared services (shared academic or administrative functions) within the institution or with other institutions:

- **Grow enrollment/utilization:** To drive increased utilization of existing capacity, institutions could build out initiatives to drive enrollments and build out capabilities to access growing segments of the higher education student population.

Increasing traditional student enrollments may prove to be a challenge given the current higher education environment of declining enrollments. However, institutions could consider additional or new ways to serve new and growing learner segments, such as nontraditional students. Institutions could also consider different types of partnerships with industry or government partners to reskill and upskill individuals to drive enrollments and reduce excess capacity. Institutions have had success offering degree programs, certificates and micro credentials that are specific to corporate partners and that provide upskilling opportunities for adult learners.

- **Share more to reduce cost base:** Consortia or shared service agreements, which facilitate administrative and academic collaboration between institutions, are another way to improve utilization and reduce the overall cost base. These agreements can enable institutions to reduce administrative overhead, particularly for functions that are non-student facing, which in turn can increase efficiency without compromising on student supports. Institutions that are smaller in scale or in close proximity to one another can benefit from improved scale associated with a shared infrastructure. The Claremont Consortium, for example, shares student counseling services, health services and resources, financial aid services, and IT services.
- **Take capacity offline:** Finally, states, university systems and individual institutions can improve utilization and reduce overall cost through merging, consolidation, or closure of underutilized institutions. Combinations of institutions, like the Boston University and Wheelock College,²⁰ allow universities to consolidate capacity and programming. In instances where combinations are not necessarily an option, institutions may need to resort to full or partial closures (like the elimination of schools at the University of Akron²¹). This has the potential to improve efficiency across academic and administrative structures.

Figure 13. M&A within higher education
Count of combinations of higher education institutions, by year of completion, 2000-2020 (June)*²²



The COVID-19 pandemic has exacerbated the pressures that already existed in higher education. It is expected to continue to accelerate change already afoot in the sector. While not all institutions will survive the crisis, those that do will likely be more resilient. The hope is that whatever change occurs, it may be with the best interests of students in mind.



¹⁹ Brown, Robert A., Chard, David J, “Lessons Learned from a College Merger,” *Inside Higher Ed*, August 7, 2018.

²⁰ Burke, Lilah. “University of Akron to Cut 6 Colleges,” *Inside Higher Ed*, May 6, 2020.

²¹ Lilah Burke, “University of Akron to Cut 6 Colleges,” *Inside Higher Ed*, May 6, 2020.

²² IPEDS, Moody’s, EY-Parthenon analysis.

²² IPEDS, Moody’s, EY-Parthenon analysis

Appendix

Methodology:

Fiscal years: the Integrated Postsecondary Education Data System (IPEDS) aggregates different metrics that are reported at different times in the year. For example, FY18 fall enrollments are reported in the 2017 IPEDS data set, because they began in 2017. FY18 financials, however, are reported at year-end and, therefore, are reported in the 2018 IPEDS data set.

Institution sector cohort methodology: to control for institutions that change their sector (e.g., moving classifications from a two-year to a four-year institution), this paper uses a cohort methodology. Each institution is placed in the sector where it was initially categorized in IPEDS, and this placement is held constant over time, even if later IPEDS reporting indicates a shift in classification. For example, if an institution was first categorized as a private two-year institution and later was categorized as a four-year institution, it remains part of the private two-year sector in this report's cohort methodology.

EYP Capacity Calculation: EY-Parthenon and Lumina Foundation agreed on: definitions of capacity (peak enrollment capacity and peak instructional capacity) and EY developed a capacity calculation that incorporates both physical enrollment capacity and instructional capacity. Each capacity metric is defined on an institution level:

- ▶ Enrollment capacity is defined as an institution's previously demonstrated maximum FTE enrollment starting in FY2003. This implies the first year of IPEDS data comes from 2002, which enables data quality across metrics.
- ▶ Instructional capacity is defined as an institution's previously demonstrated maximum student-to-faculty ratio multiplied by its current instructional staff:
 - ▶ Instructional, public service, and research FTE staff were not reported in IPEDS until FY2006; therefore, FY2006 is the first year used to inform this metric.
 - ▶ Since the IPEDS-reported student-faculty ratio only includes undergraduate students and faculty, this paper uses a separate method to calculate an overall student-faculty

ratio. For the purposes of the analysis, the student-faculty ratio is defined as total full-time equivalent fall enrollments divided by total instructional, research and public service FTE faculty.

- ▶ Instructional FTE faculty from public service and research faculty were not distinguished because instructional FTEs were not reported separately until FY2013, which would have limited further the time period for the analysis.
- ▶ As mentioned above, the count of instruction, public service, and research FTEs is a relatively new variable in IPEDS and may not yet have the same level of data validation as other variables with more history. It is possible that some institutions may misreport this data at times, leading to significant outliers in the data set. These outliers lead to an outsized student-faculty ratio and distort capacity calculations. To control for these outliers, this report uses a threshold test for defining an institution's student-faculty ratio. If an institution's maximum student-faculty ratio is more than twice its average student-faculty ratio over the 12-year period, the previously defined maximum student-faculty ratio is used. If the ratio that is outside of the threshold occurs in an institution's first year of data, the average student-faculty ratio is used. The threshold methodology controls for potential outliers from misreported faculty FTE data that may cause capacity to appear artificially large.

- ▶ **Cost regression analysis:** this paper uses a regression analysis to understand how costs and utilization are related. For the purposes of this analysis, costs are defined as core expenses per IPEDS definition:
 - ▶ An institution's core expenses in IPEDS include instruction, research, public service, student services, academic support and institutional support.
 - ▶ The regression formula is $y = ax_1 + bx_2 + c$, where y = institution's core expenses per FTE in FY18, x_1 = institution's core expenses per FTE in FY2011, and x_2 = institution's utilization under the Higher Education Capacity Calculation in FY2018. This examines the core expenses per FTE in FY2018 as a function of core expenses per FTE in FY2011.

- ▶ Because a fiscal year's financials and fall enrollments are reported in separate years in IPEDS, the regression only includes institutions with non-zero enrollments in 2010, 2011, 2017 and 2018.
- ▶ Then, the utilization coefficient, b , is used to calculate how a 1% change in utilization affects cost. The coefficient was negative across all sectors, indicating a negative relationship between utilization and core expenses per FTE.
- ▶ Finally, this paper examines each subsector within higher education at 90% and 100% utilization and uses the utilization coefficient to calculate the change to core expenses per FTE, if institutions were to increase their utilization to these target levels. This calculation is theoretical and is used to demonstrate the range of possible cost savings resulting from higher utilization.

Sources

- ▶ Bureau of Labor Statistics
- ▶ IPEDS (all Title IV, degree-granting institutions in the US)
- ▶ *Inside Higher Ed*
- ▶ Internal Revenue Service
- ▶ Ruffalo Noel Levitz, *Cost of Recruiting an Undergraduate*
- ▶ US Census Bureau



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