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Private Higher Education: Risk Assessment Framework

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Wealth Management Research
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We present a metrics based credit risk assessment of the top 50 private US colleges and universities based upon the amount debt outstanding, on a 1-5 scale (1 = lowest risk), based on their market position, financial performance and indebtedness.

Private Higher Education Sector Overview

Private colleges and universities are an essential component of the nation's education infrastructure and an important sector within the broader municipal market, providing important portfolio diversification opportunities. The sector has historically offered good tax exempt returns with moderate risk characteristics. Only one institution (Birmingham-Southern College, AL) has defaulted on its debt obligations since 1970, according to Moody's Investor Service. However, the sector is in the midst of substantial transition that will continue to increase the credit quality gap between large, highly selective institutions and the smaller, less selective ones.

Adverse demographic trends in some parts of the country and mounting concerns over affordability and the burden posed by student loans have created challenges for smaller schools. While higher educational attainment does lead to higher earnings and lower unemployment (see Fig. 1), there are substantial differences between institutions with respect to early career salaries that graduating students can expect to earn, largely driven by types of programs offered (see Fig. 2). Therefore, highly selective institutions with an emphasis on STEM programs are seeing robust student demand while smaller, less selective colleges with a liberal arts focus are finding it harder to justify and sustain their high tuition price tags, that will likely result in some closures and debt restructurings. While strong investment performance of endowment funds driven by robust financial markets has helped most institutions, that only encourages institutions with large and growing endowments to offer more student aid/discounts with no impact on their credit quality. This puts even more pressure on smaller colleges to do the same with fewer reserves and less national name recognition.

Since the top 50 institutions by debt outstanding (the focus of our analysis) also tend to be the more selective with substantial endowments, they demonstrate reasonably strong credit quality per our framework, with 38 of the 50 placed in CIO Risk Categories 1 and 2 (see Fig. 3).
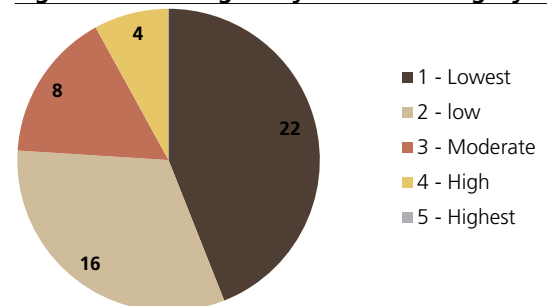
Fig.1 : Benefits of higher education
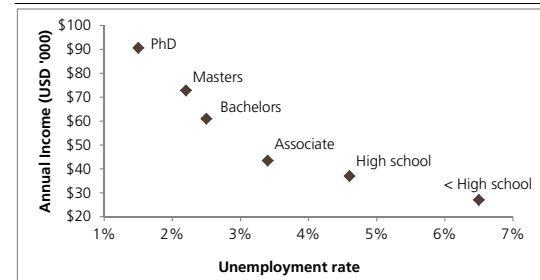
Source: Bureau of Labor Statistics

Fig. 2: STEM (Science, Technology, Engineering & Math) programs deliver higher earnings
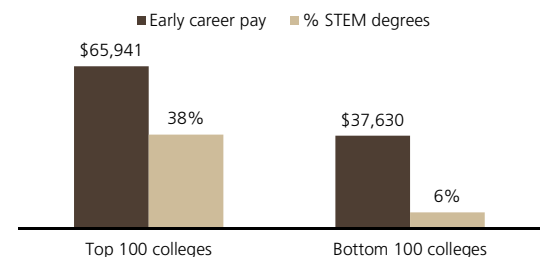
Source: UBS, www.Payscale.com

Fig. 3: No. of obligors by CIO Risk Category

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Key Results of the Framework

The key results of our framework covering the top 50 private colleges and universities with the most debt outstanding, are presented in Fig. 4 below.

Fig. 4: List of colleges and universities by CIO Risk Category (in alphabetical order within each category)

Category 1		Category 2		Category 3	
Amherst College	MA	American University	DC	Fordham University	NY
Brown University	RI	Baylor University	TX	Georgetown University	DC
Carnegie Mellon University	PA	Boston College	MA	Loyola University of Chicago	IL
Columbia University	NY	Boston University	MA	New School	NY
Cornell University	NY	California Institute of Technology	CA	Northeastern University	MA
Dartmouth College	NH	Case Western Reserve University	OH	Quinnipiac University	CT
Duke University	NC	Emory University	GA	St John's University	NY
Harvard University	MA	George Washington University	DC	University of Miami	FL
Johns Hopkins University	MD	New York University	NY		
Massachusetts Institute of Technology	MA	Southern Methodist University	TX	**Category 4**	
Northwestern University	IL	St Louis University	MO	Drexel University	PA
Princeton University	NJ	Syracuse University	NY	Emerson College	MA
Rockefeller University	NY	Tulane University	LA	Howard University	DC
Stanford University	CA	University of Chicago	IL	Rensselaer Polytechnic Institute	NY
Texas Christian University	TX	University of Rochester	NY		
Tufts University	MA	Williams College	MA		
University of Notre Dame	IN				
University of Pennsylvania	PA				
University of Southern California	CA				
Washington University	MO				
William Marsh Rice University	TX				
Yale University	CT				

Note: None of the top 50 colleges and universities (by debt outstanding) exhibited material credit weakness to warrant placement in CIO Risk Category 5. Definitions of CIO Risk Categories is provided in Fig. 5 below:

Fig. 5: CIO Risk Category Definitions

CIO Risk Category	Relative Risk Level	Definition
1	Lowest	We believe borrowers in this top tier are well-insulated from adverse credit developments in the near term. These bond issuers are characterized by having access to sufficient financial resources to withstand recessionary pressure without degradation in credit quality, in our view.
2	Low	These borrowers are highly regarded and exhibit excellent credit profiles but are not quite as well-positioned as those in our first category. However, the credit risk posed by the obligors in this category remains very low.
3	Moderate	While we view the obligors classified in the prior two categories to pose the lowest credit risks, the borrowers in Category 3 should still exhibit resilience in the face of future financial stress. Credit risk remains relatively low, though not as low as those obligors in Category 1 and 2.
4	High	We believe that obligors placed in this category, while possessing some desirable credit attributes (e.g., a commanding market position or an exclusive right to provide service) also have identifiable credit challenges such as high leverage and/or low coverage that could lead to a weaker credit profile over time and will require closer surveillance.
5	Highest	We view the obligors placed in this category to exhibit material weakness in credit quality due to adverse financial and economic conditions or idiosyncratic risks. The debt of obligors placed in this category may not be appropriate instruments for investors with conservative investment risk profiles.

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Sector Assumptions - Metric Weights and Thresholds

CIO has chosen 12 metrics (shown in Fig. 6 below) that, in our view, can easily be measured and have the most significant impact on credit quality of colleges / universities. The metrics were chosen based on subjective analysts' judgment and consensus and are categorized under three main categories (referred to as Risk Drivers); namely,

1. **Demand and Market Profile** : Since this sector is exposed to significant market competition, this risk driver has a dominating influence on a college/university's overall risk profile and therefore carries the highest weight of 45%. Key metrics include the size of the institution in terms of enrollment, measured by Full Time Equivalent students (FTE) and growth in FTEs, the degree of selectivity in admissions, matriculation ratios, and endowment per FTE. These metrics are intended to capture the strength of the institution as perceived by students and donors.

2. **Financial Performance:** We measure key metrics to determine profitability as indicated by operating margin, liquidity as measured by ratio of unrestricted resources to expenses, revenue concentration as measured by the single largest revenue type (tuition, healthcare, gifts) as a % of total operating revenues and the pace of revenue growth relative to expenses. *Note: Unrestricted resources does not include temporary restricted assets as going forward the new accounting guidelines released by the Financial Accounting Standards Board (FASB) provide for only 2 asset classifications; donor without restrictions and donor with restrictions as opposed to the current 3 way classification of unrestricted, temporary and permanently restricted.*

3. **Leverage and Coverage:** Finally, we measure the degree of indebtedness of the institution using metrics such debt service coverage ratio, cash and investments to total debt. We also use the metric average age of plant as a proxy for requiring capital investments for upgrading facilities.

Each metric is assigned a weight that represents its relative importance in determining the overall credit risk profile of a college/university. *Credit data used to calculate the metrics used in the framework was sourced from Merritt research Inc.*

Fig. 6: Metric weights and thresholds

| Risk Driver	Metric	Metric Weight	Direction of Influence	Threshold Score 1	Threshold Score 10
Service Area and Market Weight: 45.0%	Number of FTE	7.5%	⬆	12,000	1,000
	Growth in FTE (3 years)	7.5%	⬆	5%	-5%
	Selectivity ratio	10.0%	⬇	20%	75%
	Matriculation ratio	10.0%	⬆	45%	12%
	Endowment / FTE	10.0%	⬆	250,000	10,000
Financial Performance Weight: 27.5%	Operating margin (2 year average)	7.5%	⬆	10%	-10%
	Unrestricted resources / operating expenses	7.5%	⬆	175%	-25%
	Revenue concentration (% of operating revenues)	5.0%	⬇	25%	75%
	Revenue growth - Expense growth (5 years)	7.5%	⬆	25%	-25%
Leverage and Coverage Weight: 27.5%	Debt service coverage ratio	10.0%	⬆	3.75	0.50
	Cash and investments / total debt	10.0%	⬆	4.0	0.75
	Average age of plant (years)	7.5%	⬇	10	22
	Total	**100.0%**			

⬆ Higher is better
⬇ Lower is better

Source: UBS

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Just as the weight of a metric represents its relative importance, the thresholds of 1 and 10 for each metric are used as boundaries to gauge a college / university's risk level on that metric. Lets take the example of the metric Selectivity ratio within Demand and Market Profile. Selectivity ratio is the ratio of accepted students to total applications. Therefore a low ratio indicates high degree of selectivity, which is indicative of a stronger market profile. In the framework, Selectivity ratio has thresholds of 20% and 75% for a score of 1 and 10 respectively. That means colleges/ universities with selectivity ratio of 25% or lower were assigned the lowest score of 1 on this metric and those that had 75% or higher were assigned the highest risk score of 10. For colleges / universities that fall in between these values, a fitted Beta distribution of the underlying data (as shown in Fig. 7) is used to set thresholds that determine the score on this metric, as shown in Fig. 8. For example if a college / university has a selectivity ratio of 50% it will receive a score of 5 on this metric.

Another key metric, Cash and investments / total debt, (a metric within Leverage and Coverage), is best represented by a lognormal distribution, as shown in Fig. 9. Colleges / universities where the ratio of cash & investments to total debt is more than or equal to 4 receive a score of 1 and those that have a ratio of less than or equal to 0.75 receive a score of 10 and the ones in between are scored per the thresholds shown in Fig. 10. Therefore, if a college / university has this ratio at 2.50 it would be assigned a score of 4 on this metric.

Fig. 9: Distribution of Cash & investments / total debt
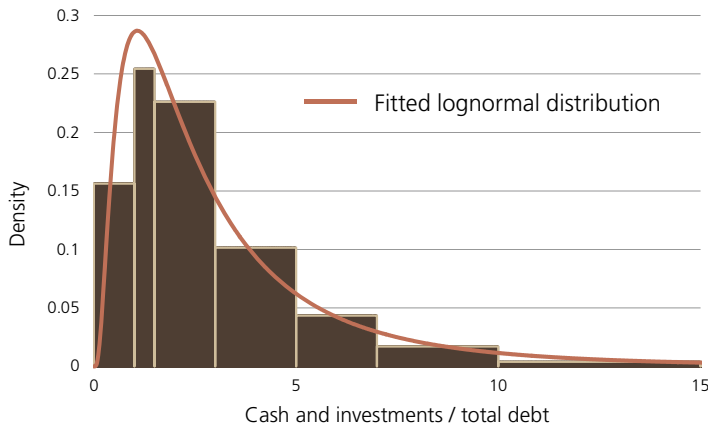
Source: UBS

In cases where a statistical distribution is unsuitable, an equally spaced linear interpolation is used to establish the thresholds between 1 and 10. In this manner, each college / university receives a score from 1-10 for each metric. A weighted average risk score is then calculated for each college / university using the all the metric weights and scores.

Fig. 7: Distribution of Selectivity ratio
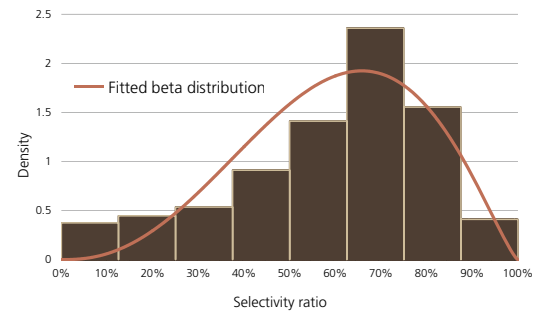
Source: UBS

Fig. 8: Thresholds for Selectivity ratio

Metric Score	Metric Threshold Selectivity ratio
1	<=20%
2	34%
3	42%
4	48%
5	53%
6	58%
7	62%
8	66%
9	71%
10	>=75%

Source: UBS

Fig. 10: Thresholds for Cash & Investments / total debt

Metric Score	Metric Threshold Cash & Investments / total debt
1	>= 4.00
2	3.34
3	2.83
4	2.41
5	2.07
6	1.76
7	1.49
8	1.24
9	1.00
10	<= 0.75

Source: UBS

Quantitative Adjustments

The framework for this sector did not warrant any quantitative adjustments to the weighted average risk score, so the final risk score was equal to the weighted average risk score.

Final Risk Score and Quantitative Risk Assessment

The final risk score, which is a number from 1-10, is then compared to a preset scale (shown in Fig. 11) to determine the Quantitative Risk Assessment of the obligor on a 1-5 scale. This scale is the same for all sectors. All obligors that receive a final risk score of 3.5 and below receive a Quantitative Risk Assessment of 1 reflecting the lowest level of relative risk and those that exceed 7.25 receive a Quantitative Risk Assessment of 5 reflecting the highest level of relative risk. For example, an obligor with a risk score of 5.25 is assigned a Quantitative Risk Assessment of 3 reflecting moderate risk.

We use a 10 point scale for individual metrics as they may have wide variation, but on an aggregate level we feel that a 5 point scale is sufficient to differentiate overall credit risk between obligors.

Fig. 11: Quantitative Risk Assessment scale

Final Risk Score	Quantitative Risk Assessment	Relative Risk Description
Between 1.00 and 3.50	1	Lowest
Between 3.50 and 5.00	2	Low
Between 5.00 and 6.25	3	Moderate
Between 6.25 and 7.25	4	High
Between 7.25 and 10.00	5	Highest

Source: UBS

Example of Quantitative Risk Assessment

The following table (Fig.12) demonstrates how the framework calculates the risk score and arrives at a Quantitative Risk Assessment for a hypothetical college / university.

Fig. 12: Weighted Average Score Calculation

Metric	Value	Weight	Score	Score * Weight
Number of FTE	11,276	7.5%	2	0.15
Growth in FTE (3 years)	0.3%	7.5%	6	0.45
Selectivity ratio	8.0%	10.0%	1	0.10
Matriculation ratio	75.0%	10.0%	1	0.10
Endowment / FTE	1,839,639	10.0%	1	0.10
Operating margin (2 year average)	1.9%	7.5%	5	0.38
Unrestricted resources / operating expenses	234.1%	7.5%	1	0.08
Revenue concentration (% of operating revenues)	53.1%	5.0%	7	0.35
Revenue growth - Expense growth (5 years)	-20.0%	7.5%	10	0.75
Debt service coverage ratio	6.23	10.0%	1	0.10
Cash and investments / total debt	6.51	10.0%	1	0.10
Average age of plant (years)	9.66	7.5%	1	0.08
Weighted Average Score				**2.73**

Source: UBS

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Given the final risk score of 2.73 as shown in Fig. 12, this college/university receives a Quantitative Risk Assessment of 1 (using the risk score scale in Table 6 shown on the previous page), indicating the lowest credit risk profile. In addition to the overall Quantitative Risk Assessment, each of the three individual risk drivers are also scored (using the metrics assigned to each risk driver) and placed on a scale of 1-5 as shown in Fig. 13. This is intended to provide a more intuitive understanding of the Quantitative Risk Assessment of the obligor. In this example, while the college has a moderate risk profile with respect to financial performance, its lowest risk profile with respect to demand and market profile and leverage & coverage still results in an overall lowest risk profile.

Fig. 13: Quantitative Risk Assessment

Risk Driver	Value
Demand and Market Profile	1
Financial Performance	3
Leverage & Coverage	1
Quantitative Risk Assessment	**1**

Source: UBS

CIO Risk Category

The CIO Risk Category for each of the 50 obligors is the same as their Quantitative Risk Assessment as we did not find any overarching qualitative factors that would warrant an adjustment for any obligor. The following tables provide detailed results for each of the 50 obligors, including a brief description, the relative risk profile of the obligor with respect to each risk driver, the resulting Quantitative Risk Assessment and finally the assigned CIO Risk Category. The obligors are presented in alphabetical order.

Definitions of key terminology are provided in an appendix at the very end of this report.

Note: Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

College/University	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assessment	CIO Risk Category
American University	DC	Opened in 1914, The American University is a Methodist-affiliated, private coeducational research university in Washington, DC. Its main campus is near Ward Circle, a residential area in the northwest portion of the District. It currently has around 7,200 undergraduate students and 4,200 graduate students.	559	1 Lowest	4 High	3 Moderate	2 Low	2 Low
Amherst College	MA	Amherst College is a small private liberal arts college located in Amherst, Massachusetts. Founded in 1821, Amherst is the third oldest institution of higher education in the state serving as an exclusively undergraduate four-year institution with approximately 1,800 students enrolled.	499	1 Lowest	1 Lowest	1 Lowest	1 Lowest	1 Lowest
Baylor University	TX	Baylor University is a private Christian university in Waco, Texas first charted in 1845. In addition to the main campus, it operates the Louise Herrington School of Nursing in Dallas and offers graduate programs at the US Army Academy of Health Sciences in San Antonio and West Point. It currently has 14,300 undergraduate and 2,700 graduate students enrolled.	597	2 Low	5 Highest	1 Lowest	2 Low	2 Low
Boston College	MA	Founded in 1863, Boston College (BC) is a private Jesuit research university located in Chestnut Hill, Massachusetts. Located approximately six miles west of downtown Boston, the school enrolls an estimated 14,000 students, two-thirds of which are undergraduates.	1,093	1 Lowest	3 Moderate	1 Lowest	2 Low	2 Low
Boston University	MA	Founded in 1839, Boston University is a large, urban, comprehensive research institution. With almost 27,000 students enrolled, it is one of the nation's largest private universities comprised half with undergraduate students and the balance with graduate.	1,512	2 Low	3 Moderate	2 Low	2 Low	2 Low
Brown University	RI	Brown University is a private Ivy League research university in Providence, Rhode Island. Founded in 1764 , it is the seventh-oldest institution of higher education in the US. It consists of about 6,500 undergraduates, 2,200 graduate students and 500 medical school students. It is currently affiliated with eight area hospitals.	820	1 Lowest	3 Moderate	1 Lowest	1 Lowest	1 Lowest
California Institute of Technology	CA	Founded in 1891, The California Institute of Technology (Caltech) is a private doctorate-granting research university located in Pasadena, California. Known for its strength in natural science and engineering, there are approximately 950 undergraduates and 1,300 graduate students.	1,249	1 Lowest	5 Highest	1 Lowest	2 Low	2 Low
Carnegie Mellon University	PA	Founded in 1900, Carnegie Mellon University (CMU) is a private nonprofit research university based in Pittsburgh, Pennsylvania. With its main campus located 3 miles from Downtown, Carnegie Mellon has approximately 13,800 students enrolled (6,500 undergraduate and 7,300 postgraduate).	546	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Case Western Reserve University	OH	Case Western University is the largest independent research university in Ohio, providing undergraduate, graduate, and professional programs in eight schools. The main campus is located in the University Circle area of Cleveland. It enrolls an estimated 5,100 undergraduate and 6,600 graduate students and is considered a leading institution in research for electrochemistry and electrochemical engineering.	531	2 Low	4 High	3 Moderate	2 Low	2 Low

Note: Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

College/University	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assesment	CIO Risk Category
Columbia University	NY	Columbia University is an elite, Ivy League university located in New York City. The university is the oldest school in New York state and the second most selective due to its strong international reputation which has led to consistent demand.	2,206	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Cornell University	NY	Cornell University is an elite, Ivy League university located in Ithaca, New York. Founded in 1865, the university is organized into seven undergraduate colleges and seven graduate divisions with each defining its admission standards. The university also administers two satellite medical campuses in New York City and Qatar.	1,428	1 Lowest	3 Moderate	1 Lowest	1 Lowest	1 Lowest
Dartmouth College	NH	Located in Hanover, New Hampshire, Dartmouth is a small, highly selective Ivy League private college with an excellent academic reputation which results in strong student demand.	1,053	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Drexel University	PA	Drexel University is an urban research university offering a diverse array of degree programs located in Philadelphia, Pennsylvania. The school has a strong regional reputation and is most well known for its cooperative education program. Drexel enrolls an estimated 24,000 which is predominately anchored by undergraduate students.	427	5 Highest	5 Highest	2 Low	4 High	4 High
Duke University	NC	Duke is a private research university located primarily in Durham, North Carolina. The consolidated university enrolls over 15,000 undergraduate and graduate students. Duke University owns, operates, and controls Duke University Health System (DUHS), which includes an academic medical center, two community hospitals, ambulatory surgical centers, and a variety of clinics, care services, and centers.	3,888	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Emerson College	MA	Emerson College is a private, nonprofit institution located in Boston, Massachusetts. The College has a focus in the area of Arts and Communication and is located within the theatre district of the city with a satellite schools in Los Angeles, California and the Netherlands.	555	3 Moderate	4 High	5 Highest	4 High	4 High
Emory University	GA	Founded in 1836, Emory is a large private research university located in Atlanta, Georgia. It has a wide array of undergraduate, graduate and professional programs, and substantial healthcare operations.	1,992	1 Lowest	3 Moderate	1 Lowest	2 Low	2 Low
Fordham University	NY	Fordham University is an independent, not-for-profit, Jesuit University located in New York City. It was founded in 1841, and currently enrolls 9,200 undergraduate and 6,300 graduate students.	429	3 Moderate	5 Highest	2 Low	3 Moderate	3 Moderate
George Washington University	DC	The George Washington University (GWU), located in Washington DC, was established in 1821 as Columbian College by an act of Congress. In 1904, its name was changed to The George Washington University and most recently enrolled approximately 27,000 students.	1,856	1 Lowest	2 Low	5 Highest	2 Low	2 Low

Comment: George Washington University's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 3. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.

Note: Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

College/University	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Asessment	CIO Risk Category
Georgetown University	DC	Founded in 1789, Georgetown University is the oldest Catholic and Jesuit institute of higher learning in the US. There are currently 7,600 undergraduate students enrolled, and 10,200 graduate students. The university is located in the Georgetown neighborhood of Washington, DC. It is affiliated with National Institutes of Health, INOVA Fairfax Hospital, Virginia Hospital Center, Washington Hospital Center, and Veterans Affairs Medical Center.	983	1 Lowest	5 Highest	5 Highest	3 Moderate	3 Moderate
Harvard University	MA	Harvard is an Ivy League private university established in 1636. Its campus spans Cambridge and Boston, Massachusetts. Harvard enrolls over 20,000 students and generates more than $5bn in operating revenue. It enjoys an international reputation for superior academics and research, as well as extraordinary student demand and fundraising.	5,301	1 Lowest	1 Lowest	1 Lowest	1 Lowest	1 Lowest
Howard University	DC	Founded in 1867, Howard University is a private, research university comprised of 13 schools and colleges. Students pursue studies in more than 120 areas leading to undergraduate, graduate and professional degrees. The main campus sits in the northwest portion of DC, 2 miles from the Capitol. It has roughly 6,300 undergraduate students, and 4,000 graduate students.	440	3 Moderate	5 Highest	5 Highest	4 High	4 High
Johns Hopkins University	MD	Founded in 1876, Johns Hopkins is based in Baltimore, Maryland. Serving as the first research university in the US, it has enrollment of approximately 24,000. More than two-thirds of total enrollment is from its graduate and professional programs.	1,247	1 Lowest	4 High	1 Lowest	1 Lowest	1 Lowest
Loyola University of Chicago	IL	Founded in 1870, Loyola University of Chicago (LUC) is a private Catholic University which offers a diverse offering of undergraduate, graduate and professional degrees. LUC has an enrollment of 15,000, 30% of which are graduate and professional students. LUC sold Loyola University Health System (LUHS) to Trinity Health Credit Group in 2011 and has worked together to towards facilities and academic planning.	404	3 Moderate	2 Low	2 Low	3 Moderate	3 Moderate
Massachusetts Institute of Technology	MA	Massachusetts Institute of Technology (MIT) is world-renowned for science and engineering education and for its research activities. The university enrolls approximately 11,000 students, 40% being undergraduates. MIT's premier reputation for science and engineering education and research are its core credit strength.	3,259	1 Lowest	3 Moderate	1 Lowest	1 Lowest	1 Lowest
New School	NY	The New School is a private non-profit research university located in New York City. Founded in 1919 as The New School for Social Research, it is a medium sized liberal arts school with an estimated enrollment of 6,800 undergraduate students and 3,100 graduate students.	606	3 Moderate	4 High	3 Moderate	3 Moderate	3 Moderate
New York University	NY	New York University (NYU) is one of the nation's largest private institutions. A mostly urban institution, its main campus is located in the Greenwich Village section of Manhattan. Notably, it has opened degree-issuing campuses in Abu Dhabi and Shanghai in the last five years.	6,309	1 Lowest	4 High	3 Moderate	2 Low	2 Low
Northeastern University	MA	Founded in 1898, Northeastern University is a private research university in Boston, Massachusetts. The university has satellite locations in Charlotte, NC, Seattle, WA, San Jose, CA, and Toronto, Ontario. There are currently 17,900 undergraduate and 7,500 graduate students enrolled.	877	2 Low	3 Moderate	3 Moderate	3 Moderate	3 Moderate

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Note: Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

College/University	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Asessment	CIO Risk Category
Northwestern University	IL	Founded in 1851, Northwestern is a highly selective private university with campuses in Evanston and Chicago, IL, and in Qatar. The university has over 18,000 students across its undergraduate and graduate programs.	2,049	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Princeton University	NJ	Located in Princeton, New Jersey, Princeton University is an Ivy League liberal arts school with a large research presence. It enrolls approximately 8,000 students, of which two-thirds are undergraduates. Princeton has a history of strong donor support and overall financial results which supports the university's exceptional reputation resulting in high student demand.	3,654	1 Lowest	1 Lowest	1 Lowest	1 Lowest	1 Lowest
Quinnipiac University	CT	Quinnipiac University is a private university located in Hamden, Connecticut, with 6,500 undergraduate and 2,500 graduate students enrolled. The school is known for its nationally recognized polling institute throughout the US.	487	4 High	2 Low	3 Moderate	3 Moderate	3 Moderate
Rensselaer Polytechnic Institute	NY	Established in 1824, Rensselaer Polytechnic Institute (RPI) is a private research university and space-grant institution located in Troy, New York, with two additional campuses in Hartford and Groton, Connecticut. RPI currently enrolls 7,633 students (6,314 undergraduate and 1,213 graduate) and is known for its science and engineering focus.	758	2 Low	4 High	5 Highest	4 High	4 High
Rockefeller University	NY	Located in New York City, The Rockefeller University is a center for scientific research, primarily in the biological and medical sciences, that provides doctoral and postdoctoral education. Rockefeller is the oldest biomedical research institute in the United States with a very small enrollment of approximately 200.	771	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Southern Methodist University	TX	Southern Methodist University (SMU) is a private research university in University Park, Texas, surrounded by the City of Dallas. The University was founded in 1911 and offers a large humanities and sciences program. It also operates satellite campuses in Plano, TX and Taos, NM. There are approximately 6,400 undergraduate and 5,300 graduate students enrolled.	659	2 Low	2 Low	3 Moderate	2 Low	2 Low
St John's University	NY	St. Johns University is a private Roman Catholic university located in New York City, NY. Founded in 1870, it currently enrolls approximately 16,000 undergraduate students along with 4,600 graduate students. It has academic locations in Italy, France, and Ireland. It offers more than 100 bachelor, master, and doctoral degrees.	484	3 Moderate	3 Moderate	2 Low	3 Moderate	3 Moderate
St Louis University	MO	Founded in 1818, Saint Louis University is a private Jesuit University which provides education to an estimated enrollment of 13,500 students. With locations in Saint Louis, Missouri and Madrid, Spain, the university offers a wide variety of programs and also receives substantial revenues within its physician practice plan which is associated with its school of medicine.	411	3 Moderate	4 High	1 Lowest	2 Low	2 Low
Stanford University	CA	Stanford is a large, private research university located in Stanford, California, adjacent to Palo Alto, with over 16,300 full-time equivalent students.	3,954	1 Lowest	1 Lowest	1 Lowest	1 Lowest	1 Lowest
Syracuse University	NY	Founded in 1870, Syracuse university is a private institution located in Syracuse, New York. Students can choose from more than 200 majors, 100 minors, and 200 advanced degree programs. There are currently 15,200 undergraduate and 6,600 graduate students enrolled.	438	2 Low	3 Moderate	1 Lowest	2 Low	2 Low

Note: Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

College/University	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assessment	CIO Risk Category
Texas Christian University	TX	Texas Christian University (TCU) is a private Christian-based, coeducational university in Fort Worth, Texas, established in 1873. The university consists of eight constituent colleges and schools and has a classical liberal arts curriculum. There are approximately 10,300 undergraduate and 1,500 graduate students enrolled.	522	1 Lowest	3 Moderate	1 Lowest	1 Lowest	1 Lowest
Tufts University	MA	Tufts University is a private research university in Medford, Massachusetts. Founded in 1852, Tufts currently has 5,500 undergraduate and 5,900 graduate students enrolled. For more than a century, Tufts was a small New England liberal arts college until its transformation into a larger research university in the 1970s.	779	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Tulane University	LA	Founded in 1834, Tulane University is a private research university in New Orleans, Louisiana. It was initially founded as a public medical school before becoming a comprehensive university in 1847. There are approximately 8,400 undergraduate students and 5,100 graduate students enrolled.	724	2 Low	3 Moderate	2 Low	2 Low	2 Low
University of Chicago	IL	Founded in 1890 by John D. Rockefeller, the University of Chicago is a large private research university with prestigious academic programs and internationally recognized research, including that conducted in collaboration with Argonne National Laboratory and Fermi National Accelerator Laboratory, both US government labs. The university is located on 211 acres in Chicago's Hyde Park neighborhood, seven miles south of downtown Chicago. It owns and operates the University of Chicago Medical Center, its academic medical center and strategic partner in research and medical education.	3,630	1 Lowest	3 Moderate	3 Moderate	2 Low	2 Low
University of Miami	FL	Chartered in 1925, University of Miami is a private comprehensive research university located in south Florida with over 16,000 full-time equivalent students, approximately two-thirds of which are undergraduates. The University of Miami is viewed as the largest, most comprehensive private research university in the southeastern region of the US. It has significant healthcare exposure through ownership of three hospitals and a large faculty practice plan.	1,384	2 Low	4 High	2 Low	3 Moderate	3 Moderate
Comment: The University of Miami's CIO Risk Category was adjusted upward from its previously published CIO Risk Category 4. The creation of CIO's quantitative framework model resulted in a recalibration of some credits, including this one.								
University of Notre Dame	IN	Established in 1842, The University of Notre Dame is a private Catholic university located in Notre Dame, Indiana. The university maintains high academic standards (particularly for its undergraduate program) and ranks among the most selective universities in the nation. There are currently 8,400 undergraduate students, and 3,700 graduate students enrolled.	1,112	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
University of Pennsylvania	PA	The University of Pennsylvania (Penn) is a large, comprehensive, Ivy League research university composed of 12 schools and a large health care system, located in Philadelphia which was founded in 1740. Highly selective, Penn enrolls over 22,500 students, of which about half are in graduate and professional programs. The University of Pennsylvania Health System (UPHS) consists of 6 hospitals located in Philadelphia and the surrounding area.	3,574	1 Lowest	3 Moderate	1 Lowest	1 Lowest	1 Lowest

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Note: Demand and Market Profile, Financial Performance and Leverage & Coverage scores are individual Risk Drivers which are used to compute the Quantitative Risk Assessment.

College/University	State	Obligor Description	Total Debt Outstanding (in USD mn)	Demand and Market Profile	Financial Performance	Leverage and Coverage	Quantitative Risk Assesment	CIO Risk Category
University of Rochester	NY	The University of Rochester (UR) is a private research university located in Rochester, New York. The University of Rochester enrolls approximately 5,600 undergraduates and 4,600 graduate students. The doctoral programs for economics and political science are historically ranked among the top five worldwide in career placement.	1,235	1 Lowest	5 Highest	1 Lowest	2 Low	2 Low
University of Southern California	CA	The University of Southern California (USC) is a large private research university in Los Angeles, California. Founded in 1880, it is the oldest private research university in California. There are approximately 19,000 undergraduate students, and 26,000 graduate students enrolled. USC has a large array of majors, and is known for its strong tradition of innovation and entrepreneurship.	1,729	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
Washington University	MO	Founded in 1853, Washington University is a prominent and comprehensive research university serving approximately 15,000 students in St. Louis, MO. About half of all students are enrolled in graduate and professional programs.	2,031	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest
William Marsh Rice University	TX	William Marsh Rice University (commonly referred to as Rice University) was founded in 1912 and is a private research university located in Houston, Texas. With an estimated 4,000 undergraduate and 3,000 graduate students enrolled, Rice is known for its emphasis on education and student-faculty ratio. The university has a very high level of research activity.	957	1 Lowest	1 Lowest	1 Lowest	1 Lowest	1 Lowest
Williams College	MA	Williams College is a small private liberal arts school located in Williamstown, Massachusetts. It was established in 1793, and enrolls an estimated 2,000 undergraduate and 57 graduate students. It is one of the most selective colleges in the US.	445	1 Lowest	3 Moderate	2 Low	2 Low	2 Low
Yale University	CT	Located in New Haven, Connecticut, and founded in 1701, Yale is a world leader in education and research. The highly selective university enrolls almost 13,000 students and derives almost 25% of operating revenue from clinical care through its affiliation with Yale New Haven Health, which it neither owns nor operates.	3,785	1 Lowest	2 Low	1 Lowest	1 Lowest	1 Lowest

Appendix - Definitions of key terminology

FTE: Full Time Equivalents is a measure of full time enrolled students. If an institution has 10,000 FTE it could comprise 8,000 full-time students and 4,000 half-time students.

Selectivity ratio: is the ratio of number of students admitted to the number of students who applied. A very low ratio (e.g. 10%) is indicative of a highly selective institution with a very strong market position, where only 1in 10 students who apply get admission offers.

Matriculation ratio: is the ratio of the number of students who actually enroll to the number of students who received admission offers. A high ratio is indicative of the desirability of the institution.

Endowment: are funds that a college or university receives from donors such as its alumni that are intended to support / expand / create various programs. Some donors would impose conditions as to how the moneys can be used while others may make unconditional donations. In either case these endowment funds are invested in an investment portfolio. Colleges and universities with large endowment fund portfolios have significant financial flexibility compared to those with limited resources.

Unrestricted resources: It is a measure of liquid monetary resources that are available to the college / university for use without any restrictions. Typically these resources are important to gauge the liquidity risk of the institution. Typically calculated as follows: Unrestricted net assets - (Net Fixed assets - long term debt).

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Appendix

Analyst certification

Each research analyst primarily responsible for the content of this research report, in whole or in part, certifies that with respect to each security or issuer that the analyst covered in this report: (1) all of the views expressed accurately reflect his or her personal views about those securities or issuers; and (2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in the research report.

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Terms and Abbreviations

Term / Abbreviation	Description / Definition	Term / Abbreviation	Description / Definition
GO	General Obligation Bond	TEY	Taxable Equivalent Yield (tax free yield divided by 100 minus the marginal tax rate)
MMD	Municipal Market Data		

		Rating Agencies		Credit Ratings
	S&P	Moody's	Fitch/IBCA	Definition
Investment Grade	AAA	Aaa	AAA	Issuers have exceptionally strong credit quality. AAA is the best credit quality.
	AA+	Aa1	AA+	Issuers have very strong credit quality.
	AA	Aa2	AA	
	AA-	Aa3	AA-	
	A+	A1	A+	Issuers have high credit quality.
	A	A2	A	
	A-	A3	A-	
	BBB+	Baa1	BBB+	Issuers have adequate credit quality. This is the lowest Investment Grade category.
	BBB	Baa2	BBB	
	BBB-	Baa3	BBB-	
Non-Investment Grade	BB+	Ba1	BB+	Issuers have weak credit quality. This is the highest Speculative Grade category.
	BB	Ba2	BB	
	BB-	Ba3	BB-	
	B+	B1	B+	Issuers have very weak credit quality.
	B	B2	B	
	B-	B3	B-	
	CCC+	Caa1	CCC+	Issuers have extremely weak credit quality.
	CCC	Caa2	CCC	
	CCC-	Caa3	CCC-	
	CC	Ca	CC+	Issuers have very high risk of default.
	C		CC	
			CC-	
	D	C	DDD	Obligor failed to make payment on one or more of its financial commitments. this is the lowest quality of the Speculative Grade category.

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Appendix