Financial Report 2018–2019

Yale University

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Front cover
Photographs by Michael Marsland

Back cover
Maya Lin Women's Table, photographed by Jack Devlin

Highlights

Five-Year Financial Overview ($ in millions)	Fiscal Years 2019	2018	2017	2016	2015
Net Operating Results - Management View	$ 87	$ 91	$ 115	$ 37	$ 17
Financial Position Highlights:					
Total assets	$ 44,428	$ 41,873	$ 39,194	$ 36,957	$ 36,972
Total liabilities	12,186	9,616	10,208	10,419	9,587
Total net assets	$ 32,242	$ 32,257	$ 28,986	$ 26,538	$ 27,385
Endowment:					
Net investments, at fair value	$ 30,295	$ 29,445	$ 27,217	$ 25,413	$ 25,543
Total return on investments	5.7%	12.3%	11.3%	3.4%	11.5%
Spending from endowment	4.6%	4.7%	4.8%	4.5%	4.5%
Facilities:					
Land, buildings and equipment, net of accumulated depreciation	$ 5,355	$ 5,092	$ 4,967	$ 4,779	$ 4,510
Disbursements for building projects	$ 447	$ 367	$ 395	$ 498	$ 302
Debt	$ 3,945	$ 3,785	$ 3,515	$ 3,534	$ 3,558
Statement of Activities Highlights					
Operating revenues	$ 4,105	$ 3,817	$ 3,619	$ 3,424	$ 3,358
Operating expenses	3,835	3,627	3,452	3,318	3,151
Increase in net assets from operating activities	$ 270	$ 190	$ 167	$ 106	$ 207

Five-Year Enrollment Statistics	2019	2018	2017	2016	2015
First-Year Enrollment Class of:	'22	'21	'20	'19	'18
First-Year applications	35,306	34,154	31,445	30,236	30,932
First-Year admitted	2,229	2,316	1,988	2,034	1,950
Admissions rate	6.3%	6.8%	6.3%	6.7%	6.3%
First-Year enrollment	1,573	1,579	1,371	1,364	1,360
Yield	70.6%	69.4%	70.3%	68.8%	71.5%
Total Enrollment:					
Yale College	5,964	5,743	5,472	5,532	5,477
Graduate and professional schools	7,469	7,228	6,986	6,853	6,859
Total	13,433	12,971	12,458	12,385	12,336
Yale College Term Bill and Financial Aid:					
Yale College term bill	$ 69,430	$ 66,900	$ 64,650	$ 62,200	$ 59,800
Average grant award for students receiving aid	$ 57,633	$ 53,703	$ 50,950	$ 48,294	$ 46,445

Message from the President

It is a privilege to present the Yale Financial Report for 2018-2019. The accomplishments detailed in this report reflect the extraordinary work and dedication of all members of the Yale community. By carefully stewarding our resources, Yale is able to strengthen our university and, more importantly, fulfill our mission “to improve the world today and for future generations.”

For over 300 years, Yale has endeavored to bring light and truth to the world through education and research. Today, we advance our mission by educating leaders who serve in every sector of society and by creating knowledge that benefits humanity. As we face unprecedented challenges and opportunities worldwide, our work is more critical than ever. That is why Yale is making strategic investments in areas where we can have the greatest impact.

A historic investment in science is a major component of the academic strategy I announced in 2016. Some of humanity’s most pressing and urgent questions can only be answered through science and innovation. Yale’s responsibility as a great research university calls us to expand scientific understanding and lead the way toward a healthier and more sustainable future. The Yale Science Building, which opened this summer, symbolizes our commitment to working across multiple fields to answer important questions. The building brings together faculty and students from around the university through the colocation of a number of departments and through the shared use of key scientific facilities like the Quantitative Biology Institute. And it includes substantial teaching and research space, as well as a pavilion and café, to encourage interactions across the biological and physical sciences.

All around the university, we are breaking down barriers and investing in areas where we can make the greatest impact. This year we announced the establishment of the Yale Jackson School of Global Affairs. This new school will advance our commitment to cross-disciplinary collaboration by bringing together scholars, policymakers, and practitioners whose work spans borders. Faculty in political science, economics, history, and the law school have asked for appointments in Jackson because they see the great potential of this multidisciplinary environment. By convening world leaders and working collaboratively across fields, our students and faculty will set the agenda in areas such as global health, political instability, and cyberwarfare.

We also established the Tobin Center for Economic Policy, a part of Yale’s commitment to advancing evidence-based research to solve critical challenges. It will become a focal point for faculty and students interested in domestic policy analysis and address a need in the United States for non-partisan, policy-relevant research. An inaugural executive director was named and began his work this fall.

At Yale we are deepening our investment in the humanities—disciplines that are vital to understanding the human experience. The renovation and expansion of 320 York Street will place many humanities departments under a single roof, along with signature programs like Directed Studies and the Whitney Humanities Center. This superb project is progressing well, opening up new spaces for classrooms, faculty offices, student study spaces, and offices where teaching fellows can meet with students. By increasing multidisciplinary collaboration and providing a central hub for the humanities at Yale, 320 York Street will enhance our ability to ask and answer meaningful questions about ourselves and the world.

With educational and research partnerships on every continent, we are fulfilling Yale's responsibility to improve lives around the globe. The Yale Africa Initiative, now in its sixth year, is one of the most exciting areas of growth. Our students and faculty in medicine, public health, business, architecture, environmental science, and many other areas are working with colleagues across the continent to develop innovative solutions for disease outbreaks, sanitation, housing shortages, and wildlife conservation. By forging bilateral partnerships with universities, governments, and NGOs, we are ensuring that Yale is working collaboratively to make the greatest impact in Africa and worldwide.

Throughout its rich history, Yale has prepared leaders who have written important chapters in our nation and our world. Today, Yale aspires to be the global research university most committed to teaching and learning; we put our students' education at the center of all that we do. The new Schwarzman Center—a campus center with performance, dining, and social spaces—will strengthen connections among our undergraduate, graduate, and professional students; faculty members; and the local community. Construction is well underway on this extraordinary project, which includes the renovation of the historic Commons. Soon, the Schwarzman Center will become a vibrant crossroads for student life, arts, and culture on our campus.

Our students, faculty, staff, and alumni are committed to working together to solve great challenges—for our nation and our world. By carefully managing our financial resources, we will ensure that Yale is able to fulfill its vital mission, today and for generations to come. To the entire Yale community: thank you for your hard work, your support, and your commitment to this university.

Sincerely,

Peter Salovey

Peter Salovey
President
Chris Argyris Professor of Psychology

Message from the Senior Vice President for Operations and the Vice President for Finance

Strong Financial Results

Yale finished the year ended June 30, 2019 with a surplus from operations on both a generally accepted accounting principles ("GAAP") and Management View basis. Yale generated a surplus of $270 million on a GAAP basis and a surplus of $87 million on a Management View basis – the way Yale looks at financial information for internal discussion and decision-making purposes (see page 7 for additional information).

The balance sheet indicates a strong financial position, with $32 billion in net assets. This number is steady from the prior year, largely due to two offsetting factors: a) an increase in the Yale Endowment, which had a 5.7% investment return for the year; and b) a decrease in the funded status of the university's defined benefit retirement plans.

Revenue and Expense Growth

Revenue grew by $288 million or 7.6%. Each of Yale's three largest revenue sources – allocation of endowment spending, medical services income, and sponsored research, which together accounted for 78% of the university's revenues – demonstrated growth over the prior year, contributing to the positive operating result.

Annual payout from the endowment remains the largest source of revenue for the university's operations, contributing $1,355 million (33% of total revenues for the year), an increase of 5.7% over the prior year. This amount, authorized by the board of trustees, is based on Yale's Endowment Spending Policy. Under this policy, the university aims to spend 5.25% of the endowment's value each year, equating to approximately one quarter of the market value of the endowment every five years. This policy, based on sound principle and economic theory, is one of the most important management practices underpinning the university's current and future financial strength.

Medical services or patient care is the second largest source of revenue at Yale. It finished the year at $1 billion (25% of total revenue), 12.0% above the prior year. This growth results from the continued expansion of Yale Medicine, one of the largest academic multi-specialty practices in the country. Sponsored research (20% of total revenue) is the university's third largest source of revenue. It totaled $824 million, 4.2% above the prior year, as faculty continued to secure highly competitive research funding from federal, state, and foundation sources.

Operating expenses increased by $208 million or 5.7% as a result of increases in people-related expenses (which comprise 62% of total expenses) where faculty and staff costs grew and employee benefits continued to experience upward pressure from healthcare and retirement benefit costs. The increases in expenses are consistent with growth in the university's three largest revenue sources noted above: endowment, medical services, and sponsored research income.

Increase and Impact of Contributions

Donations from individuals, corporations, and foundations represent a vitally important source of revenue for the university. In aggregate, contributions totaled $627 million in the fiscal year ended June 30, 2019, representing a 73.8% increase from the prior year and the second highest amount ever. This remarkable generosity provides necessary funding for current operations, long-term investments, and permanent resources for core activities for future generations. In spring 2019, President Salovey announced the transformation of the Jackson Institute for Global Affairs into the Yale Jackson School of Global Affairs, the first new professional school at Yale since 1976, one major example of the impact of philanthropy at Yale.

Capital Spending Highlights

The 2018-19 fiscal year included $447 million in capital spending, 21.8% above the prior year. The largest investments were in the sciences, supporting President Salovey's academic priorities. This includes the Yale Science Building, which opened its doors in September 2019. During the year, the university also completed renovation work on Robert C. and Christine Baker Hall at the Law School, which opened in September 2018. Other capital spending during the year included continued work on a major renovation of the Hall of Graduate Studies – the future home for Humanities departments – and further renovations as part of the Schwarzman Center project.

Tax Cuts and Jobs Act

In December 2017, the federal government enacted the Tax Cuts and Jobs Act (the "Act"), which included a number of provisions that impact the university. While many of these provisions are effective beginning with the 2018-19 fiscal year, a great deal of uncertainty remains about these new rules. The provisions will negatively impact the university's finances – both in terms of substantial tax payments to the federal government and increased administrative complexity, but we will not know the full impact until the Department of the Treasury issues further guidance. The increased taxes and administrative costs result from several provisions of the Act including the excise taxes on net investment income and executive compensation, as well as changes to unrelated business taxable income.

Financial Statement Presentation and Preparation

This year's annual report reflects the university's adoption of new accounting guidance from the Financial Accounting Standards Board ("FASB") pertaining to contributions received, contributions made, and revenue from contracts with customers. These changes dictate whether transactions are accounted for as contributions or exchanges and whether contributions are conditional. Note, however, the impact of adopting this guidance was not significant to the university's financial statements.

Yale's pension and retiree health care benefit obligations represent the promised stream of future cash flows for benefits earned by current and former employees. These cash flows must be discounted to reflect the time value of money. The university recently revised its methodology for determining the interest rates it uses to discount these obligations, primarily because of the changing demographics of benefit plan participants. For the 2019 fiscal year end, Yale applied a discount rate of 3.1%. This change had the effect of significantly increasing the present value of these retirement benefit obligations.

Looking Ahead

As noted in previous years, we are actively identifying and aligning resources to advance the president's academic priorities – in particular, an increased investment in science. We also continue to invest in faculty excellence, the arts, humanities, and social sciences. These investments are crucial for strengthening Yale, so it continues to educate leaders who will help shape the future. We look forward to providing updates in the years ahead.

Thank you to all the faculty, students, staff, alumni, and friends who continue to be so generous with their unfailing support of Yale in its "commitment to improving the world today and for future generations through outstanding research and scholarship, education, preservation, and practice."

Jack F. Callahan, Jr. Senior Vice President for Operations and Chief Operating Officer	Stephen C. Murphy Vice President for Finance and Chief Financial Officer

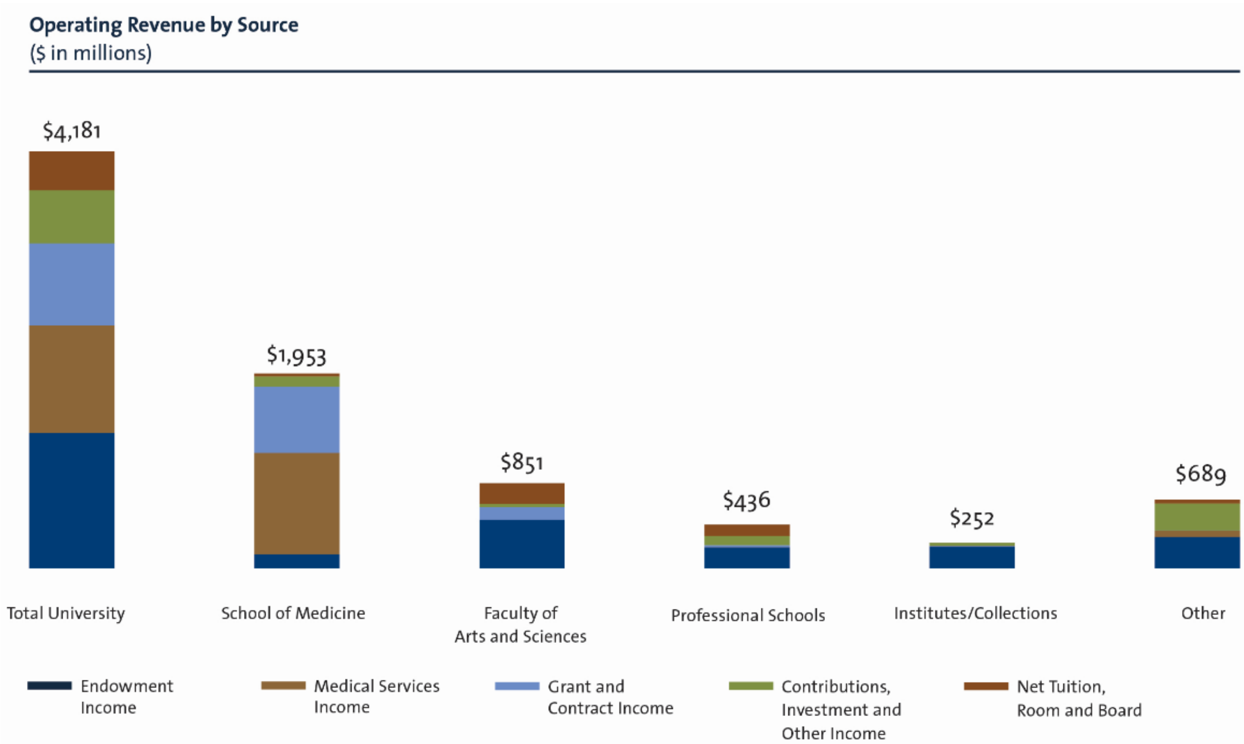
Financial Results

Overview

Yale University ("Yale" or the "university") manages its operations to achieve long-term financial equilibrium. It is committed to sustaining both the programs and the capital assets (endowment and facilities) supporting those programs over multiple generations. Endowment income, Yale's largest source of revenue, is allocated to the operating budget based on a spending policy that preserves the endowment asset values for future generations, while providing a robust revenue stream for current programs. Similarly, Yale's operating budget provides the major portion of the funds needed, through the capital replacement charge ("CRC"), to replenish the capital base necessary to ensure that buildings are maintained to support current programs.

Fiscal Year 2019 Management View Results

The university budget structure is managed through 47 separate budget units that are combined into five categories for reporting purposes.



The largest unit is the School of Medicine, representing 47% of university total operating revenue. The School of Medicine engages in research, teaching, and clinical practice. Revenues for patient care services, net of contractual adjustments, are primarily based on negotiated contracts from managed care companies (36%), BlueCross BlueShield (26%), Medicare (20%), Medicaid (9%) and commercial insurance and others (9%). Additionally, approximately 34% of the School of Medicine's medical services income in 2019 represents revenue recognized as a result of the university's affiliation with Yale-New Haven Hospital (the "Hospital"). Yale Medicine ("YM") is one of the largest academic multi-specialty practices in the country and the largest in Connecticut. As of June 30, 2019, YM was composed of 1,267 full-time and 243 part-time physicians providing services in over 100 specialty and subspecialty areas organized into 21 departments, engaging in research, and participating in teaching approximately 995 total students (excluding Ph.D. students) and 876 residents. The School of Medicine performs significant research for federal, state and corporate entities. Research funded by the federal government represents 77% of total research performed at the School of Medicine with the National Institutes of Health ("NIH") providing the largest component of that funding at 91%. The university has established policies and procedures to manage and monitor compliance with these important agreements. School of Public Health revenues are included in the figures reported for the School of Medicine.

The Faculty of Arts and Sciences includes Yale's undergraduate and graduate programs in the arts and sciences. During the 2018-2019 academic year, 5,964 undergraduate students were enrolled at Yale College. The undergraduate population is a diverse group attracted from across the United States and from many foreign countries. Foreign students account for approximately 11% of the undergraduate population. Yale College is dedicated to providing undergraduates with a liberal arts education that fosters intellectual curiosity, independent thinking, and leadership abilities. Students learn to think critically and independently and to write, reason, and communicate clearly in preparation for a spectrum of careers and vocations. During the 2018-2019 academic year, 3,032 students were pursuing their studies at the Graduate School of Arts and Sciences. Yale Graduate School of Arts and Sciences considers learning to teach to be an integral part of doctoral education and incorporates training and teaching opportunities into every program. Throughout the unique program of study crafted by graduate students and their faculty advisers, the university provides support that allows Ph.D. students to focus on their scholarship, successfully complete their degrees, and pursue rewarding careers.

The Professional Schools category includes the Divinity School, the Law School, the School of Art, the School of Music, the School of Forestry & Environmental Studies, the School of Nursing, the School of Drama, the School of Architecture, and the School of Management. During the 2018-2019 academic year, 3,442 students were pursuing their studies at one of Yale's professional schools. Institutes and Collections includes the libraries, museums and galleries, and large institutes with significant programmatic and financial activity across multiple academic units. First-hand encounters with Yale's collections are an integral part of teaching and learning across the university, helping students forge creative connections and inspiring tomorrow's leaders. The Other category includes Athletics and various administrative and support units.

The university ended the year with a surplus from operations of $87 million on a Management View basis. Actual operating revenues increased 8% and actual operating expenses, excluding transfers, increased 7% compared to 2018. Endowment income growth contributed to a strong revenue increase. Grant and contract income was higher than the prior year. In addition, the clinical practice continues to grow at a rapid pace.

The consolidated statement of activities in the audited financial statements is presented in accordance with accounting principles generally accepted in the United States of America ("GAAP"). GAAP recognizes revenue when earned and expenses when incurred. The Management View, used for internal decision-making, is focused more on resources available and used in the fiscal period presented. The Management View presents the expenses related to the defined benefit plans differently as compared to GAAP and does not include certain revenue that will not be received within the next fiscal year, such as pledged contribution revenue. Another significant difference is that the Management View recognizes capital maintenance through a CRC and recognizes equipment purchases as expense in the year acquired versus the historical cost depreciation expensed in the consolidated statement of activities. The Management View includes the realized gains and losses on energy hedges and interest rate swaps used to manage exposure to energy and interest rate fluctuations. GAAP requires these realized gains and losses to be presented net of related unrealized gains and losses. The GAAP financial statements do not present fund balance transfers between the operating, physical, and financial categories, as the Management View does. The Management View presentation, along with a summary of the differences between the university's net operating results from the Management View to the GAAP View, is presented below.

Yale University Operating Results – Management View

for the years ended June 30, 2019 and 2018 ($ in thousands)

	June 30, 2019	June 30, 2018
Revenues:		
Tuition, room and board - gross	$ 730,424	$ 680,077
Tuition discount	(338,492)	(305,909)
Tuition, room and board - net	391,932	374,168
Grants and contract income	823,530	789,975
Medical services income	1,081,322	961,572
Contributions	162,321	156,244
Endowment income	1,354,667	1,280,991
Investment and other income	367,618	311,985
Total external income	**4,181,390**	**3,874,935**
Expenses:		
Faculty salaries	966,457	911,095
All other salaries	906,040	858,811
Employee benefits	647,313	568,287
Total salaries and benefits	**2,519,810**	**2,338,193**
Stipends and fellowships	105,622	101,550
Non-salary expenses	970,465	910,070
Interest, CRC and other amortization	347,716	337,529
Total expenses	**3,943,613**	**3,687,342**
Transfers	(150,566)	(96,645)
TOTAL NET OPERATING RESULTS (MANAGEMENT VIEW)	**87,211**	**90,948**
Summary of differences between the Management View and GAAP presentation of net operating results:		
Operating pledge activity	48,582	(18,308)
Expenses related to long-term liabilities	37,540	(8,142)
Capital funding, depreciation and disposals	(34,106)	(29,227)
Lease activity	(53,000)	-
Interest rate and energy hedge	28,698	42,360
Deferred investment income	5,000	16,185
Funding transfers	150,566	96,645
INCREASE IN NET ASSETS FROM OPERATIONS PER THE CONSOLIDATED STATEMENT OF ACTIVITIES (GAAP VIEW)	**$ 270,491**	**$ 190,461**

Fiscal Year 2019 GAAP Results

Operating Revenue

The university derives its operating revenue from the following sources: tuition, room and board (net of certain scholarships and fellowships), grants and contracts, medical services, endowment income, contributions, investment, and other income.

Net Tuition, Room and Board

Net tuition, room and board totaled $387 million in fiscal year 2019, an increase of 3% from 2018, and represented 9% of the university's total operating revenue. Tuition, room and board totaled $730 million in 2019, an increase of 7% from 2018. Of this amount, $637 million represents tuition, an 8% increase over 2018 due primarily to the increased enrollment in Yale College coupled with an increase in the related term bill, and $93 million represents revenue from room and board, which increased 6% from 2018. In accordance with GAAP, student income is presented net of certain scholarships and fellowships, which totaled $343 million and $304 million for 2019 and 2018, respectively.

Tuition for students enrolled in Yale College was $53,430, and room and board was $16,000, bringing the total term bill to $69,430 for the 2018-2019 academic year. The increase in the Yale College term bill was 4% over the 2017-2018 academic year.

The university maintains a policy of offering Yale College admission to qualified applicants without regard to family financial circumstances. This "need-blind" admission policy is supported with a commitment to meet in full the demonstrated financial need of all students throughout their undergraduate years with little or no student debt subsequent to graduation.

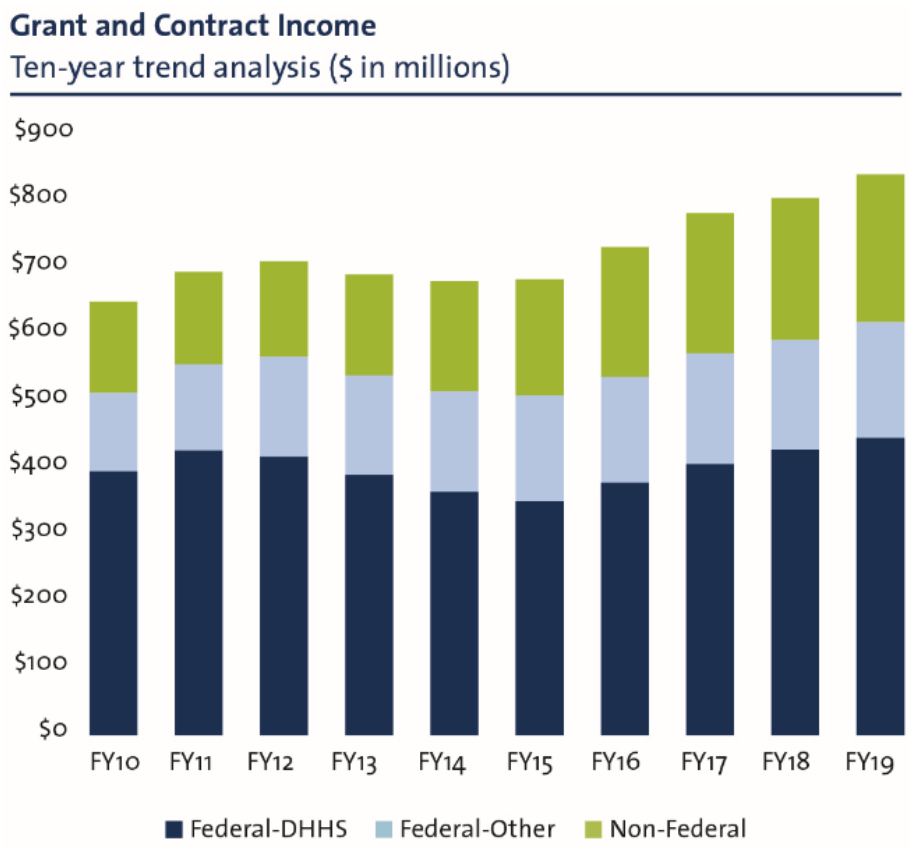
During the 2018-19 academic year, 53% of Yale College undergraduates received financial aid. In the Graduate School of Arts and Sciences, 95% received financial aid in the form of tuition discounts, stipends, and health insurance. In the professional schools, 80% received financial aid. In all, 71% of total university eligible students enrolled received some form of university-administered student aid in the form of scholarships, loans, or a combination of both scholarships and loans.

Grant and Contract Income

Grant and contract income totaled $824 million in fiscal year 2019, an increase of 4% from 2018, and represented 20% of the university's total operating revenue. The Yale School of Medicine, which received 81% of the university's grant and contract income in fiscal year 2019, reported an increase of 5% for 2019, while the remaining university units decreased by less than 1%.

Revenue recognized on grants and contracts from the federal government was $612 million, or 74% of 2019 grant and contract income, supporting Yale's research and training programs. Included in the $612 million is the Department of Health and Human Services ("DHHS") funding of $446 million, primarily through the NIH, an increase of 4% compared to the prior year. The university also receives significant research funding from the National Science Foundation, the Department of Energy, the Department of Defense, and student aid awards from the Department of Education. Non-federal sources, which include foundations, voluntary health agencies, corporations, and the State of Connecticut, provided an additional $212 million in funding for research, training, clinical, and other sponsored agreements during 2019.

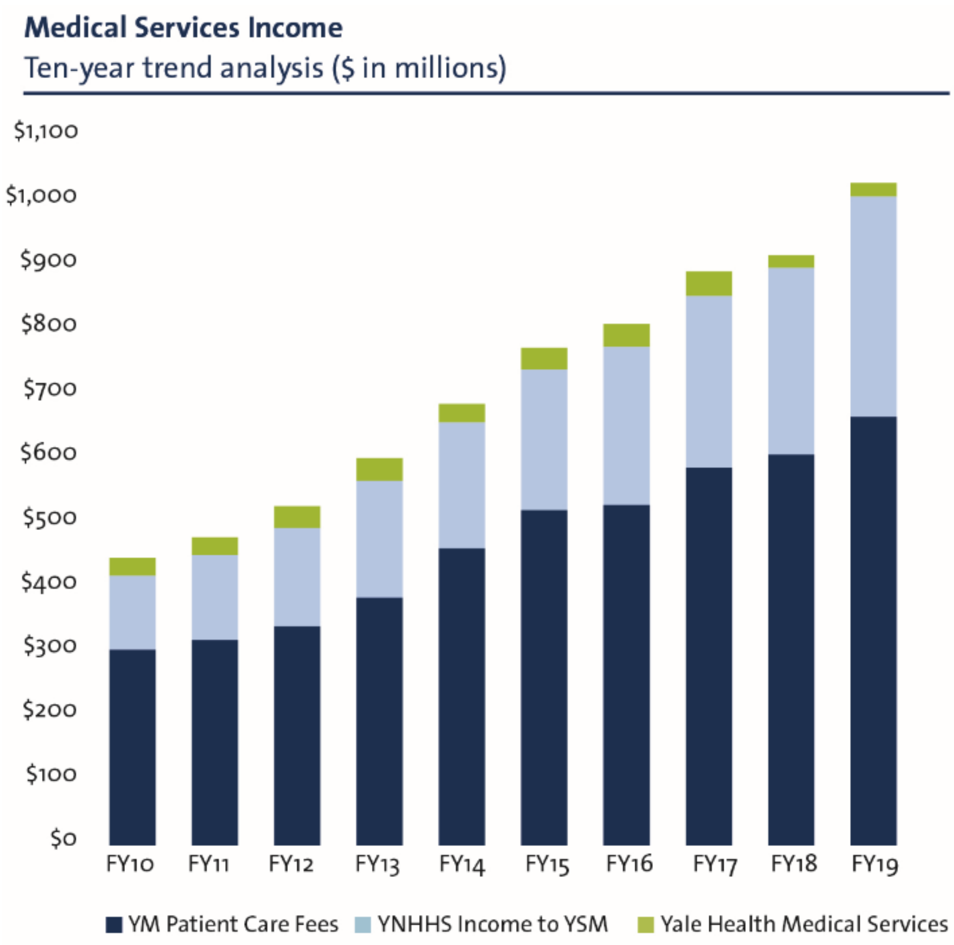
In addition to the reimbursement of direct costs charged to sponsored awards, sponsoring agencies reimburse the university for a portion of its facilities and administrative costs, which include costs related to research laboratory space, facilities, and utilities, as well as administrative and support costs incurred for sponsored activities. These reimbursements for facility and administrative costs amounted to $210 million in 2019 and $205 million in 2018. Recovery of facility and administrative costs associated with federally sponsored awards is recorded at rates negotiated with DHHS, the university's cognizant agency.



Medical Services Income

Medical services income totaled $1.0 billion in fiscal year 2019, an increase of 12% from 2018, and represented 25% of the university's operating revenue. The largest portion of this revenue stream is derived from medical services provided by the School of Medicine's Yale Medicine ("YM"), one of the largest academic multi-specialty practices in the country and the largest in Connecticut. The strong investment in YM for physician leadership, recruitment and program development by the Hospital continued in fiscal year 2019 with support increasing by 18%, to a total of $341 million.

Medical services income generated by YM increased by $110 million over 2018, or 12%. Clinical activity increased 5% over 2018 due to new faculty hires and the continued focus on improving physician productivity. Other contributors to the clinical income growth include expansion of medical services outside of New Haven County through affiliated hospital contracts with Lawrence + Memorial, Greenwich, and Bridgeport hospitals.



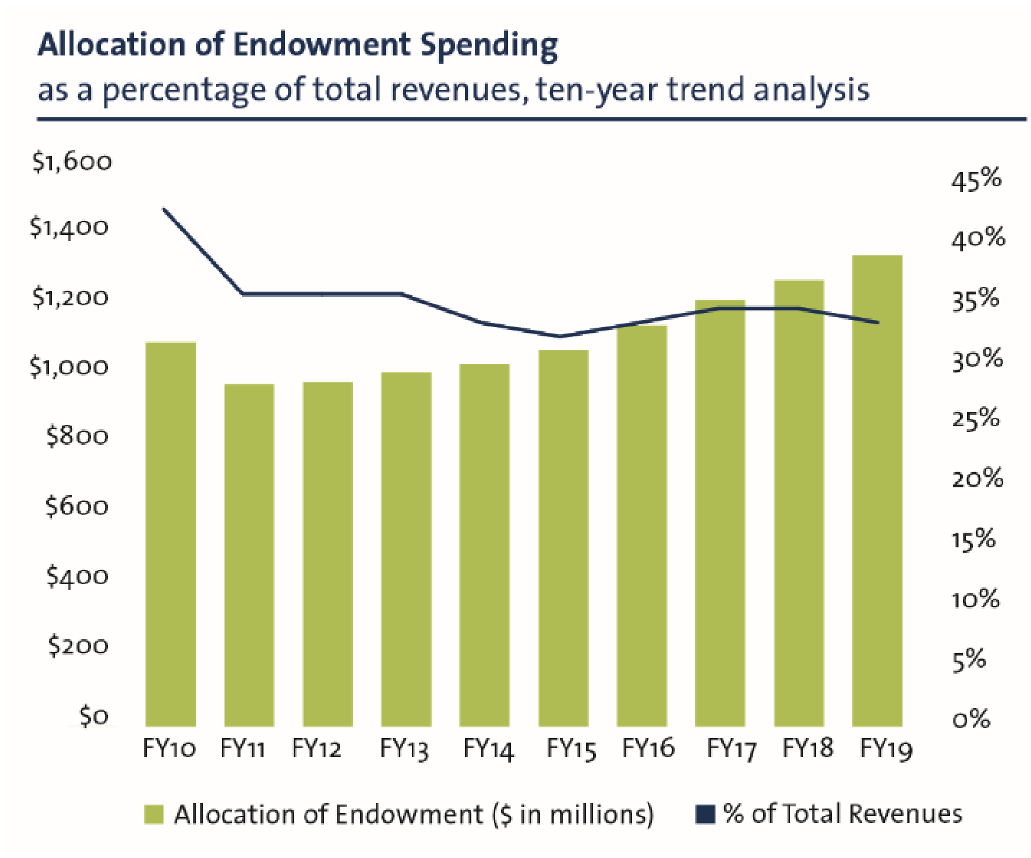
Contributions

Donations from individuals, corporations, and foundations represent a vitally important source of revenue for the university. Gifts to the university provide necessary funding for current operations, for long-term investments in the university's physical infrastructure, and, in the case of gifts to the endowment, provide permanent resources for core activities for future generations. Gifts of $211 million in 2019 and $138 million in 2018, made by donors to support the operations of the university, are reflected as contribution revenue in the operating section of the consolidated statement of activities, whereas gifts to the university's endowment and for building construction and renovation are reflected as contribution revenue in the non-operating section. In aggregate, contributions included in the university consolidated financial statements total $627 million in 2019 compared to $361 million in 2018.

Certain gifts commonly reported in fundraising results are not recognized as contributions in the university's consolidated financial statements. For example, "in-kind" gifts such as works of art and books that will be maintained as part of the university's collections are not recognized as financial transactions in the consolidated financial statements. Grants from private, non-governmental sources (i.e., corporations and foundations) reported as gifts for fund raising purposes are included in the consolidated statement of activities as grant and contract income.

Allocation of Endowment Spending

Each year a portion of accumulated endowment investment returns is allocated to support operational activity. This important source of revenue represents 33% of total operating revenue in fiscal year 2019, and it remains the largest source of operating revenue for the university. The level of spending is computed in accordance with an endowment spending policy that has the effect of smoothing year-to-year market swings. Endowment investment returns allocated to operating activities increased by 6% in 2019 to $1.4 billion. Additional information on Yale's endowment spending policy is provided in the endowment section of this report and in the footnotes to the consolidated financial statements.



Other Investment Income

Other investment income includes interest, dividends, and gains on non-endowment investments.

Other Income

Other income primarily includes publications income, income from executive education and other non-degree granting programs, royalty income, admissions revenue relating to athletic events and drama productions, parking revenue, special event and seminar fees, and application and enrollment fees.

Operating Expenses

Operating expenses totaled $3.8 billion for 2019, representing a 6% increase over 2018. With 4,739 faculty, 1,299 postdoctoral associates, 4,837 managerial and professional staff, and 5,030 clerical, technical, service, and maintenance personnel, personnel costs are the single largest component (62%) of the university's total operating expenses (counts represent headcount as of fall 2018).

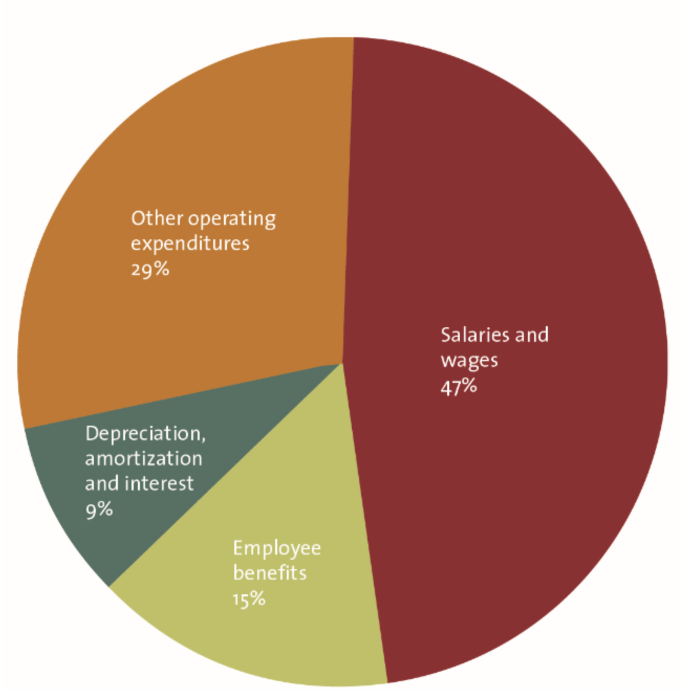
Personnel costs were $2.4 billion in 2019, a 5% increase over 2018. Faculty salary expenses increased 6% which includes growth in clinical activities. Staff salaries and wages increased 6% from 2018 to 2019. The cost of providing employee benefits, including various pension, post-retirement health, and insurance plans in addition to Social Security and other statutory benefits, totaled $578 million for 2019, an increase of 1% from 2018.

Depreciation, amortization, and interest expenses increased 9% from 2018, primarily as a result of higher depreciation and interest costs in fiscal year 2019.

Other operating expenses, including services, materials and supplies, and other expenses, increased 7% from 2018, primarily as a result of increased grant-funded and clinical activities in the School of Medicine.

Yale reports its operating expenses by natural classification in the consolidated statement of activities and discloses these operating expenses across functional classification in the Notes to Consolidated Financial Statements in accordance with GAAP.

Operating Expenses by Natural Classification

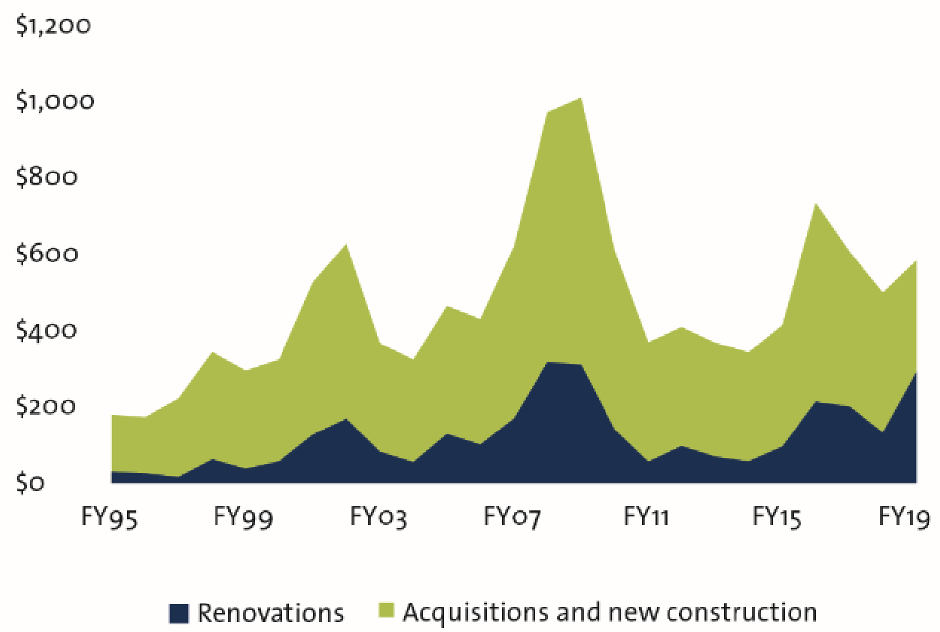


According to functional classification, the university spent 70% of its operating resources on programmatic support, 23% on patient care and other related services, and 7% on administrative and other institutional support. Patient care activities are integral to academic and learning experiences at the university.

Physical Capital

Capital spending on facilities in fiscal year 2019 totaled $447 million. This represents an increase of approximately 22% from the 2018 spending level.

Capital Spending by Year
(in 2019 dollars, in millions)



The largest share of the university's capital spending, 31%, was invested in the sciences. Construction of the university's landmark project on Science Hill, the Yale Science Building, continued throughout the year. This seven-level facility has modern spaces for teaching and research, including a large lecture hall that hosts courses in diverse disciplines. It will be home to the Department of Molecular, Cellular and Developmental Biology, as well as part of the Department of Molecular Biophysics and Biochemistry, the Quantitative Biology Institute, and certain physics labs. The Yale Science Building opened in fall 2019.

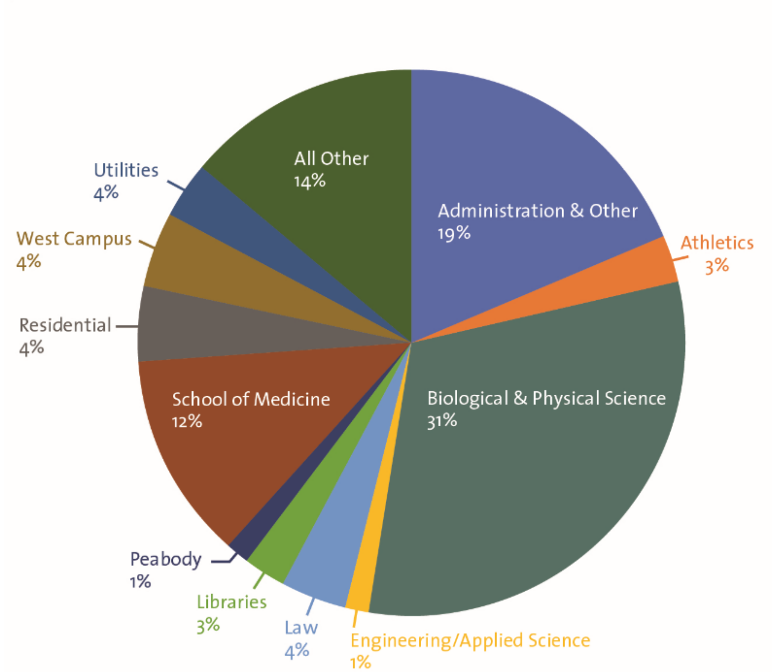
Nineteen percent of the university's capital spending for 2019 was invested in administrative and other building projects. Construction is progressing on The Schwarzman Center, which will transform the historic Commons and three floors of the adjacent Memorial Hall, both built at the university's bicentennial in 1901. The complex at the center of the campus will become the central hub of student life by creating versatile performance, exhibition, meeting, dining, and gathering spaces. The Schwarzman Center will also present performances and cultural events in the historic Woolsey Hall. The project is expected to be completed in 2020.

Capital spending at the School of Medicine, with investments in research space and modernization of facilities, accounted for approximately 12% of the university's 2019 capital expenditures.

The transformation of 320 York Street (Hall of Graduate Studies), another landmark investment, into the new hub for the humanities is well underway and represents approximately 9% of the university's capital spending for 2019. The project was planned with student and faculty input and will be home to many humanities departments and have space for graduate students to work and to meet with undergraduates during their teaching terms. It will also include a high-tech film screening room that will help students connect to other people and cultures through film. The building is scheduled to open in summer 2020.

The university's ambitious renovation and building plans were funded by a combination of gifts, debt, and funds from the operating budget. The university continues to rely heavily on the extraordinary generosity of its alumni and friends. Gifts for facilities in 2019 totaled $91 million. The university has been the beneficiary of an outstanding response from donors for the renovation of the Schwarzman Center, the construction of 320 York Street (Hall of Graduate Studies), Baker Hall, Reese Stadium, Carol Roberts Field House, and the Tsai Center for Innovative Thinking at Yale (Becton Innovation Center).

Capital Spending by Campus Area



An important source of funding for the capital program is debt provided through the Connecticut Health and Facilities Authority ("CHEFA") which allows the university to borrow at tax exempt rates. This funding source is critical to keeping the cost of funding at lower levels which allows the university to maximize the use of its resources in the fulfillment of its mission of teaching and research. The university used the bond proceeds of $300 million from the issuance of CHEFA Series 2017 C-2, issued in December 2017, to finance planned renovation and capital additions. The university continues to receive the highest bond ratings available: AAA from Standard and Poor's and Aaa from Moody's.

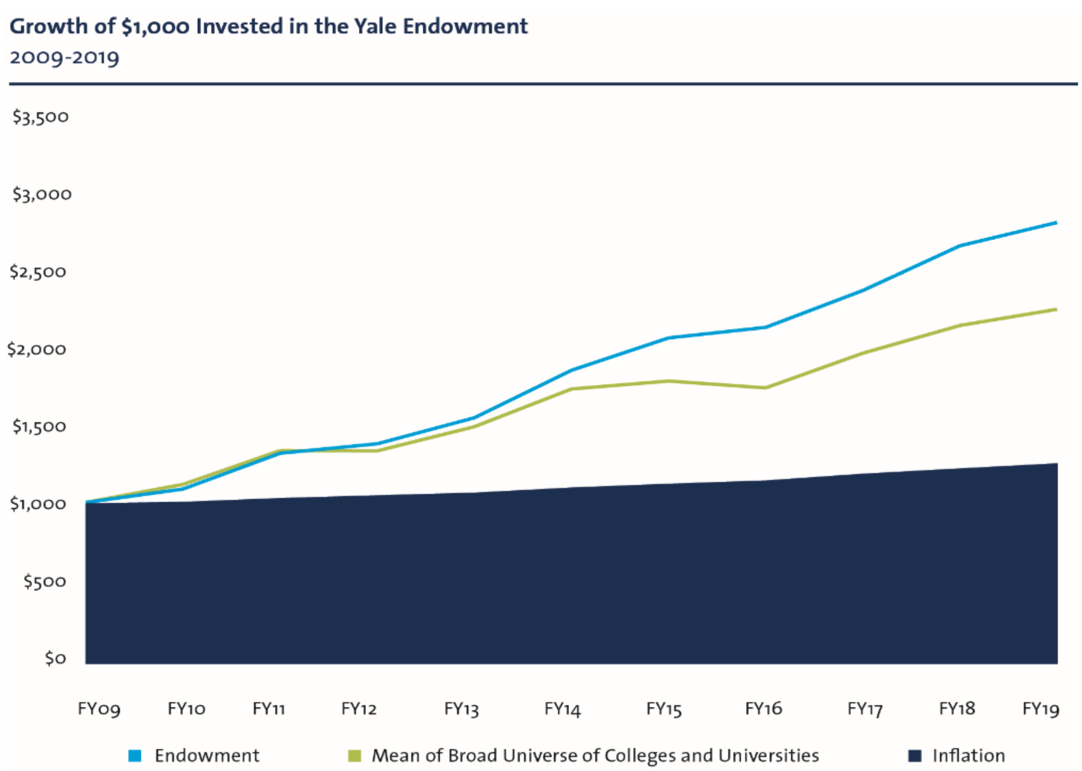
Recognizing the critical importance of maintaining its physical capital over many generations, the university allocates funds directly from the operating budget to a capital maintenance account. The annual equilibrium funding target for internal purposes is an estimate that is earmarked from annual operating funding sources to maintain Yale's facilities in good condition on a consistent basis, thus avoiding deferred maintenance. While not an exact science, an estimate of the full capital replacement equilibrium level for 2019 is $241 million. In 2019, most of this amount was funded with operating funds and capital gifts.

Endowment

The endowment provides the largest source of support for the academic programs of the university. To balance current and future needs, Yale employs investment and spending policies designed to preserve endowment asset values while providing a substantial flow of income to the operating budget. At June 30, 2019, net assets in the endowment totaled approximately $30.3 billion, after the allocation of endowment spending of $1.4 billion to the operating budget during the year.

Investment Performance

For the fiscal year ended June 30, 2019, the endowment earned a 5.7% investment return. During the past decade, the endowment earned an annualized 11.1% return, which added $3.9 billion of value relative to a composite passive benchmark and $7.1 billion relative to the mean return of a broad universe of colleges and universities.



Endowment Spending

The endowment spending policy, which allocates endowment earnings to operations, balances the competing objectives of providing a stable flow of income to the operating budget and protecting the real value of the endowment over time. The spending policy manages the trade-off between these two objectives by using a long-term target spending rate combined with a smoothing rule, which adjusts spending in any given year gradually in response to changes in endowment market value.

The target spending rate approved by the Yale Corporation currently stands at 5.25%. According to the smoothing rule, endowment spending in a given year sums to 80% of the previous year's spending and 20% of the targeted long-term spending rate applied to the market value at the start of the prior year. The spending amount determined by the formula is adjusted for inflation and an allowance for taxes and constrained so that the calculated rate is at least 4.0%, and not more than 6.5%, of the endowment's inflation adjusted market value at the start of the prior year. The smoothing rule and the diversified nature of the endowment mitigate the impact of short-term market volatility on the flow of funds to support Yale's operations.

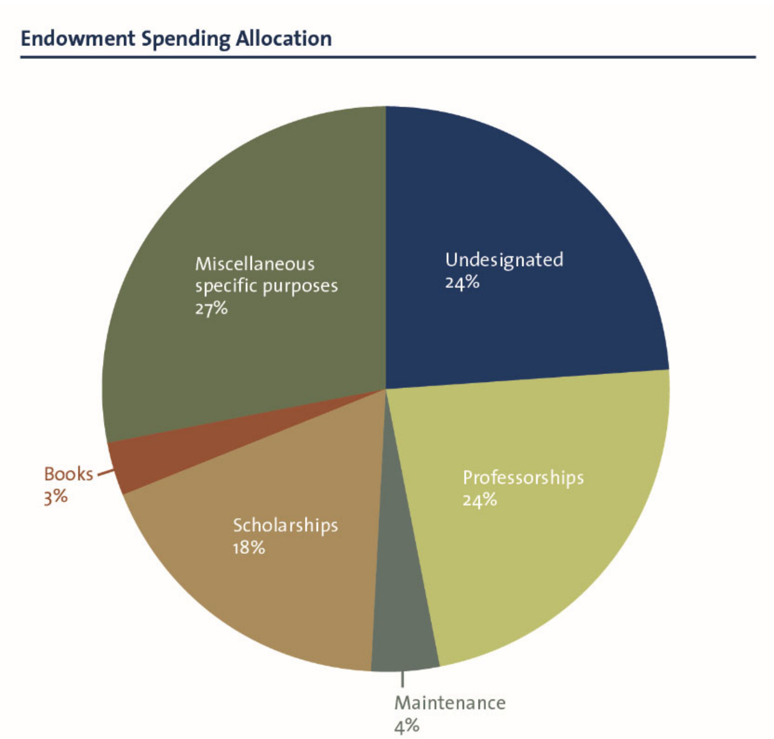
The majority of endowment spending is allocated across multiple purposes, including financial aid and professorships, based on donor restrictions or internal designations by the university. Endowment spending that is neither restricted nor designated provides additional support for budgetary priorities, such as financial aid and professorships, as well as for other purposes to carry out the university's mission.

Asset Allocation

Asset allocation proves critical to successful endowment performance. Yale's asset allocation policy combines tested theory and informed market judgment to balance investment risks with the desire for high returns.

Both the need to provide resources for current operations and the desire to preserve the purchasing power of assets dictate investing for high returns, which leads the endowment to be weighted toward equity. In addition, the endowment's vulnerability to inflation directs the university away from fixed income and toward equity instruments. Hence, over 90% of the endowment is invested in assets expected to produce equity-like returns, through domestic and international securities, real assets, and private equity.

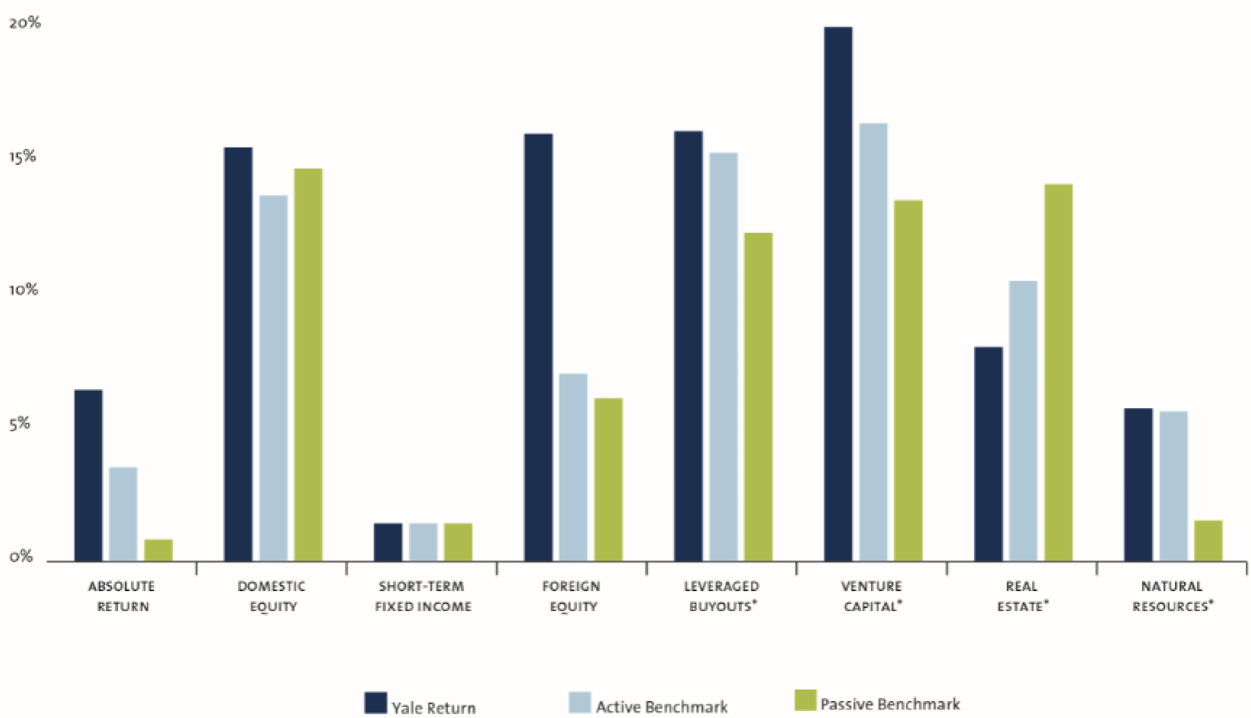
Over the past thirty years, Yale significantly reduced the endowment's exposure to traditional domestic marketable securities, reallocating assets to nontraditional asset classes. In 1989, nearly 70% of the endowment was committed to U.S. stocks, bonds, and cash. Today, Yale targets approximately 10% of the portfolio to domestic marketable securities and around 90% to private equity, absolute return strategies, real assets, and foreign equity.



The heavy allocation to nontraditional asset classes stems from the diversifying power they provide to the portfolio as a whole. Alternative assets, by their nature, tend to be less efficiently priced than traditional marketable securities, providing an opportunity to exploit market inefficiencies through active management. Today's portfolio has significantly higher expected returns and lower volatility than the 1989 portfolio.

Asset Class	June 30, 2019	Current Target
Absolute Return	23.2%	23.0%
Venture Capital	21.1%	21.5%
Leveraged Buyouts	15.9%	16.5%
Foreign Equity	13.7%	13.75%
Real Estate	10.1%	10.0%
Cash and Short-Term Fixed Income	8.4%	7.0%
Natural Resources	4.9%	5.5%
Domestic Equity	2.7%	2.75%
Total	100.0%	100.0%

Yale Endowment
Annualized Returns vs. Benchmarks by Asset Class
Net of Fees, Ten Years Ended June 30, 2019



*Yale's returns and active benchmarks are money-weighted.

Active Benchmarks

Absolute Return: Credit Suisse and Inverse Wilshire 5000 Composite
Domestic Equity: BNY Median Manager, U.S. Equity
Fixed Income: Barclays 6-12 Month U.S. Treasury Index after June 2018. Barclays 1-3 Year Treasury Index from October 2013 to June 2018. Barclays 1-5 Year Treasury Index through September 2013.
Foreign Equity: BNY Median Manager Composite, Foreign Equity
Leveraged Buyouts: Cambridge Associates Global Leveraged Buyouts
Venture Capital: Cambridge Associates Venture Capital Composite
Real Estate: Cambridge Associates Real Estate
Natural Resources: Cambridge Associates Natural Resources

Passive Benchmarks

Absolute Return: Barclays 9-12 Mo Treasury
Domestic Equity: Wilshire 5000
Fixed Income: Barclays 6-12 Month U.S. Treasury Index after June 2018. Barclays 1-3 Year Treasury Index from October 2013 to June 2018. Barclays 1-5 Year Treasury Index through September 2013
Foreign Equity: MSCI EAFE Investable Market Index / MSCI Emerging Markets Investable Market Index + MSCI China A-Share Investable Market Index, weighted according to target developed and emerging equity allocations since December 2014. MSCI EAFE Investable Market Index / MSCI Emerging Markets Investable Market Index + MSCI China A-Share Investable Market Index / Custom Opportunistic Benchmark, weighted according to target developed, emerging and opportunistic allocations through November 2014
Leveraged Buyouts: Russell 2000 (75%) / MSCI ACWI ex-US Small-Cap Index (25%)
Venture Capital: Russell 2000 Technology Index (56%) / MSCI China Small-Cap Index (20%) / NASDAQ Biotechnology Index (19%) / MSCI India Small-Cap Index (5%) after June 2018. Russell 2000 Technology Index (56%) / NASDAQ Biotechnology Index (19%) / MSCI China Small Cap Index (17%) / MSCI India Small Cap Index (8%) after April 2014 through June 2018. Russell 2000 Technology Index (75%) / MSCI China Small Cap Index (17%) / MSCI India Small Cap Index (8%) through April 2014. Russell 2000 Technology Index through June 2010
Natural Resources: Custom Timber REIT basket / S&P Oil & Gas Exploration & Production Index / Euromoney Global Mining Index / Custom Agriculture REIT Basket, weighted according to contemporaneous target timber, oil and gas, mining and agriculture allocations

Endowment Summary

Yale continues to rely on the principles of equity orientation and diversification. These principles guide Yale's investment strategy, as equity orientation makes sense for investors with long time horizons and diversification allows the construction of portfolios with superior risk and return characteristics. The university's equity-oriented, well-diversified portfolio positions the endowment for long-term investment success.

Management's Responsibility for Financial Statements

Management of the university is responsible for the integrity and reliability of the consolidated financial statements. Management represents that, with respect to the university's financial information, the consolidated financial statements in this annual report have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP").

The accompanying consolidated financial statements have been audited by the university's independent auditors, PricewaterhouseCoopers LLP. Their audit opinion, on the following page, expresses an informed judgment as to whether the consolidated financial statements, considered in their entirety, present fairly, in conformity with GAAP, the consolidated financial position and changes in net assets and cash flows.

The university maintains a system of internal controls over financial reporting, which is designed to provide a reasonable assurance to the university's management and the Yale Corporation (the "Corporation") regarding the preparation of reliable published financial statements. Such controls are maintained by the establishment and communication of accounting and financial policies and procedures, by the selection and training of qualified personnel, and by an internal audit program designed to identify internal control weaknesses in order to permit management to take appropriate corrective action on a timely basis. There are, however, inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls. Accordingly, even an effective internal control system can provide only reasonable assurance with respect to financial statement preparation. Furthermore, the effectiveness of the internal control system can change with circumstances.

The Corporation, through its Audit Committee comprised of members not employed by the university, are responsible for engaging the independent auditors and meeting with management, internal auditors, and the independent auditors to independently assess whether each is carrying out its responsibilities. Both the internal auditors and the independent auditors have full and free access to the Audit Committee.

Stephen C. Murphy
Vice President for Finance and
Chief Financial Officer

pwc

Report of Independent Auditors

To the President and Fellows of Yale University

We have audited the accompanying consolidated financial statements of Yale University and its subsidiaries (the "University"), which comprise the consolidated statements of financial position as of June 30, 2019 and 2018 and the related consolidated statements of activities for the year ended June 30, 2019 and of cash flows for the years ended June 30, 2019 and 2018.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the University's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Yale University and its subsidiaries as of June 30, 2019 and 2018 and the changes in their net assets for the year ended June 30, 2019 and their cash flows for the years ended June 30, 2019 and 2018 in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We previously audited the consolidated statement of financial position as of June 30, 2018, and the related consolidated statements of activities and of cash flows for the year then ended (the statement of activities is not presented herein), and in our report dated October 22, 2018, we expressed an unmodified opinion on those consolidated financial statements. In our opinion, the information set forth in the accompanying summarized financial information as of June 30, 2018 and for the year then ended is consistent, in all material respects, with the audited consolidated financial statements from which it has been derived.

PricewaterhouseCoopers LLP

October 22, 2019

PricewaterhouseCoopers LLP, 185 Asylum Street, Suite 2400, Hartford, Connecticut 06103
T: (860) 241 7000, F: (860) 241 7458, www.pwc.com/us

Yale University Consolidated Statement of Financial Position

as of June 30, 2019 and June 30, 2018 ($ in thousands)

		2019		2018
Assets:				
Cash and cash equivalents	$	709,449	$	587,847
Accounts receivable, net		299,673		261,642
Contributions receivable, net		670,461		511,744
Notes receivable		110,424		115,596
Investments, at fair value		37,060,058		35,113,711
Other assets		223,543		190,753
Land, buildings and equipment, net of accumulated depreciation		5,354,517		5,091,691
Total assets	$	44,428,125	$	41,872,984

		2019		2018
Liabilities:				
Accounts payable and accrued liabilities	$	506,495	$	430,183
Advances under grants and contracts and other deposits		127,955		133,512
Other liabilities		1,999,364		1,310,872
Liabilities under split-interest agreements		144,096		138,606
Bonds and notes payable		3,944,953		3,784,877
Liabilities associated with investments		5,438,228		3,791,731
Advances from federal government for student loans		25,283		26,088
Total liabilities	$	12,186,374	$	9,615,869

		2019		2018
Net Assets:				
Net assets without donor restrictions: Yale University	$	5,184,946	$	5,813,581
Net assets without donor restrictions: non-controlling interests		707,411		713,343
Total net assets without donor restrictions		5,892,357		6,526,924
Net assets with donor restrictions		26,349,394		25,730,191
Total net assets	$	32,241,751	$	32,257,115
Total liabilities and net assets	$	44,428,125	$	41,872,984

The accompanying notes are an integral part of these consolidated financial statements.

Yale University Consolidated Statement of Activities

for the year ended June 30, 2019 with summarized comparative totals for the year ended June 30, 2018 ($ in thousands)

	Without Donor Restrictions	With Donor Restrictions	2019	2018
Operating				
Revenues and releases:				
Net tuition, room and board	$ 387,172	$ -	$ 387,172	$ 375,652
Grant and contract income, primarily for research and training	823,530	-	823,530	789,975
Medical services income	1,041,988	-	1,041,988	930,163
Contributions	19,490	191,413	210,903	137,707
Allocation of endowment spending from financial capital	381,102	973,466	1,354,568	1,282,072
Other investment income	89,645	5,194	94,839	91,459
Other income	191,823	535	192,358	209,892
Total revenues	2,934,750	1,170,608	4,105,358	3,816,920
Net assets released from restrictions	1,074,031	(1,074,031)	-	-
Total revenues and releases	4,008,781	96,577	4,105,358	3,816,920
Expenses:				
Salaries and wages	1,796,642	-	1,796,642	1,696,655
Employee benefits	577,782	-	577,782	569,375
Depreciation, amortization and interest	359,432	-	359,432	329,920
Other operating expenditures	1,101,011	-	1,101,011	1,030,509
Total expenses	3,834,867	-	3,834,867	3,626,459
Increase in net assets from operating activities	173,914	96,577	270,491	190,461
Non-operating				
Contributions	13,296	403,083	416,379	223,197
Total endowment return	256,170	1,373,822	1,629,992	3,277,910
Allocation of endowment spending to operations	(210,826)	(1,143,742)	(1,354,568)	(1,282,072)
Other investment (loss) income	(301,821)	2	(301,819)	127,507
Change in funding status of defined benefit plans	(663,686)	-	(663,686)	313,884
Other increases (decreases)	65,498	(71,719)	(6,221)	(33,071)
Net assets released from restrictions	38,820	(38,820)	-	-
(Decrease) increase in net assets from non-operating activities	(802,549)	522,626	(279,923)	2,627,355
Total (decrease) increase in net assets - Yale University	(628,635)	619,203	(9,432)	2,817,816
Change in non-controlling interests	(5,932)	-	(5,932)	453,141
Total (decrease) increase in net assets	(634,567)	619,203	(15,364)	3,270,957
Net assets, beginning of year	6,526,924	25,730,191	32,257,115	28,986,158
Net assets, end of year	$ 5,892,357	$ 26,349,394	$ 32,241,751	$ 32,257,115

The accompanying notes are an integral part of these consolidated financial statements.

Yale University Consolidated Statement of Cash Flows

for the years ended June 30, 2019 and 2018 ($ in thousands)

	2019	2018
Operating activities:		
Change in net assets	$ (15,364)	$ 3,270,957
Adjustments to reconcile change in net assets to net cash used in operating activities:		
Depreciation and amortization	291,604	274,832
Unrealized gain (loss) on other investments	295,426	(161,318)
Net endowment investment gain	(1,174,398)	(2,890,256)
Change in non-controlling interests	5,932	(453,141)
Change in funding status of defined benefit plans	663,686	(313,884)
Non-operating contributions	(416,379)	(223,197)
Contributed securities	(141,628)	(121,351)
Proceeds from sale of donated securities	27,898	24,062
Other adjustments	44,297	(6,736)
Changes in assets and liabilities that provide (use) cash:		
Accounts receivable	(38,031)	(55,538)
Contributions receivable	(50,116)	18,500
Other operating assets	(39,135)	(706)
Accounts payable and accrued expenses	97,089	(40,788)
Advances under grants and contracts and other deposits	(5,557)	(3,074)
Other liabilities	24,806	93,449
Net cash used in operating activities	(429,870)	(588,189)
Investing activities:		
Student loans repaid	12,398	13,321
Student loans granted	(8,062)	(6,731)
Purchases related to capitalized software costs and other assets	(33,407)	(6,174)
Proceeds from sales and maturities of investments	13,777,776	10,436,387
Purchases of investments	(13,204,588)	(9,982,974)
Purchases of land, buildings and equipment	(492,937)	(349,452)
Net cash provided by investing activities	51,180	104,377
Financing activities:		
Proceeds from restricted contributions	307,779	310,718
Proceeds from sale of contributed securities restricted for endowment	113,730	97,290
Contributions received for split-interest agreements	8,228	7,898
Payments made under split-interest agreements	(18,283)	(16,168)
Proceeds from long-term debt	451,525	452,759
Repayments of long-term debt	(362,687)	(156,770)
Repayments to the Federal government for student loans	-	(2,417)
Net cash provided by financing activities	500,292	693,310
Net increase in cash and cash equivalents	121,602	209,498
Cash and cash equivalents, beginning of year	587,847	378,349
Cash and cash equivalents, end of year	$ 709,449	$ 587,847

The accompanying notes are an integral part of these consolidated financial statements.

Yale University
Notes to Consolidated Financial Statements

1. Significant Accounting Policies

a. General

Yale University ("Yale” or the “university") is a private, not-for-profit institution of higher education located in New Haven, Connecticut. The university is governed by the Yale Corporation (the “Corporation”), a body of nineteen Trustees consisting of the President, ten Successor Trustees who are Successors to the original Trustees, six Alumni Fellows, and the Governor and Lieutenant Governor of Connecticut, ex officio.

The university provides educational services primarily to students and trainees at the undergraduate, graduate and postdoctoral levels, and performs research, training and other services under grants, contracts and other similar agreements with agencies of the federal government and other sponsoring organizations. The university's academic organization includes Yale College, the Graduate School of Arts and Sciences, twelve professional schools and a variety of research institutions and museums. The largest professional school is the Yale School of Medicine, which conducts medical services in support of its teaching and research missions.

b. Basis of Presentation

The consolidated financial statements of the university include the accounts of all academic and administrative departments of the university, and affiliated organizations that are controlled by the university.

Financial statements of private, not-for-profit organizations measure aggregate net assets and net asset activity based on the absence or existence of donor-imposed restrictions. Net assets are reported as without donor restrictions and with donor restrictions and serve as the foundation of the accompanying consolidated financial statements. Brief definitions of the two net asset classes are presented below:

Net Assets Without Donor Restrictions - Net assets derived from tuition and other institutional resources that are not subject to explicit donor-imposed restrictions. Net assets without donor restrictions also include board designated funds functioning as endowment.

Net Assets With Donor Restrictions - Net assets that are subject to explicit donor-imposed restrictions on the expenditure of contributions or income and gains on contributed assets, net assets from endowments not yet appropriated for spending by the Corporation and student loan funds. In addition, net assets with donor restrictions include restricted contributions from donors classified as funds functioning as endowment. The university records as net assets with donor restrictions the original amount of gifts which donors have given to be maintained in perpetuity. Restrictions include support of specific schools or departments of the university, for professorships, research, faculty support, scholarships and fellowships, library and art museums, building construction and other purposes. When time and purpose restrictions expire, net assets with donor restrictions are reclassified to net assets without donor restrictions.

Measure of Operations - The university's measure of operations as presented in the consolidated statement of activities includes revenue from tuition (net of certain scholarships and fellowships) and fees, grants and contracts, medical services, contributions for operating programs, the allocation of endowment spending for operations and other revenues. Operating expenses are reported on the consolidated statement of activities by natural classification.

The university's non-operating activity within the consolidated statement of activities includes contributions to the university's endowment and for building construction and renovation, investment returns and other activities related to endowment, and long-term benefit plan obligation funding changes.

Liquidity - The university's financial assets available within one year of the balance sheet date for general expenditure as of June 30, 2019 and 2018, are as follows, in thousands of dollars:

		2019	2018
Total assets, at year end		$44,428,125	$41,872,984
Less nonfinancial assets:			
	Land, buildings and equipment, net of accumulated depreciation	5,354,517	5,091,691
	Other assets	223,543	190,753
Financial assets, at year end		38,850,065	36,590,540
Less those unavailable for general expenditure within one year due to:			
	Contractual or donor-imposed restrictions:		
	Restricted by donor with time or purpose restrictions	595,649	452,734
	Subject to appropriation and satisfaction of donor restrictions including board designated endowments	34,779,353	32,855,805
	Other long-term notes receivable	110,424	115,596
	Other contractual restrictions	-	75,968
Financial assets available to meet cash needs for general expenditures within one year		$ 3,364,639	$ 3,090,437

The university has $3,364.6 million of financial assets that are available within one year of the balance sheet date to meet cash needs for general expenditure consisting of cash of $709.4 million, accounts receivable of $299.7 million, contributions receivable of $74.8 million, and short-term investments of $2,280.7 million. In addition to these available financial assets, a significant portion of the university's annual expenditures will be funded by current year operating revenues including tuition, grant and contract income and medical services income. The university has a policy to structure its financial assets to be available as its general expenditures, liabilities, and other obligations come due. As part of its liquidity management, the university invests cash in excess of daily requirements in various short-term investments, including US government instruments.

Additionally, the university has board-designated funds of $5.3 billion. Although the university does not intend to spend from this endowment, other than amounts appropriated for general expenditure as part of its annual budget approval and appropriation process, amounts from its board-designated funds could be made available if necessary. However, both the board-designated funds and donor-restricted endowments contain investments with lock-up provisions that would reduce the total investments that could be made available (see Note 2 for disclosures about investments).

c. Cash and Cash Equivalents

Cash and cash equivalents are recorded at cost, which approximates fair value, and include institutional money market funds and similar temporary investments with maturities of three months or less at the time of purchase. Cash and cash equivalents awaiting investment in the long-term investment pool are reported as investments and totaled $660.8 million and $260.6 million at June 30, 2019 and 2018, respectively. Cash and cash equivalents do not include cash balances held as collateral.

Supplemental disclosures of cash flow information include the following, in thousands of dollars:

		2019		2018
Cash paid during the year for interest	$	129,527	$	110,482
Noncash investing activities:				
Land, buildings and equipment purchases payable to vendor	$	47,308	$	35,718
Assets acquired under capital leases		77,169		-

d. Investments

Fair Value - The university's investments are recorded in the consolidated financial statements at fair value.

Fair value is a market-based measurement based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering assumptions, a three-tier fair value hierarchy has been established which prioritizes the inputs used in measuring fair value. The hierarchy of inputs used to measure fair value and the primary methodologies used by the university to measure fair value include:

- *Level 1* – Quoted prices for identical assets and liabilities in active markets. Market price data is generally obtained from relevant exchange or dealer markets.
- *Level 2* – Inputs, other than the quoted prices in active markets, that are observable either directly or indirectly, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable.
- *Level 3* – Unobservable inputs for which there is little or no market data, requiring the university to develop its own assumptions.

Assets and liabilities measured at fair value are determined based on the following valuation techniques:

- *Market approach* – Prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities; and
- *Income approach* – Techniques to convert future amounts to a single present amount based on market expectations, including present value techniques and option-pricing models.

The fair value of publicly traded fixed income and equity securities is based upon quoted market prices and exchange rates, if applicable. The fair value of direct real estate investments is determined from periodic valuations prepared by independent appraisers.

Investments are exposed to various risks, such as interest rate, market and credit risks. Due to the level of risk associated with certain investments, it is at least reasonably possible that changes in the values of investments will occur in the near term and that such changes could materially affect the amounts reported in the university's consolidated financial statements.

Derivatives - Derivative financial instruments in the investment portfolio include interest rate swaps, equity swaps, credit default swaps, commodity swap contracts, and currency forward contracts which are recorded at fair value with the resulting gain or loss recognized in the consolidated statement of activities.

Resell and Repurchase Agreements - Cash paid relating to resell agreements is generally collateralized by federal agency and foreign debt securities. The university takes possession of the underlying collateral and monitors the value of the underlying collateral to the amount due under the agreement. Cash received under repurchase agreements is collateralized by investments in asset backed securities, corporate debt, federal agency debt, and foreign debt securities. Collateral fair value is monitored to the amounts due under the agreements.

Management Fees - The university records the cost of managing its endowment portfolio as a decrease in non-operating activity within the applicable net asset class in the consolidated statement of activities. Management fees consist of the internal costs of the university's Investments Office (the "Investments Office"), outside custodian fees, and fees for external investment managers and general partners.

Total Return - The university invests its endowment portfolio and allocates the related earnings for expenditure in accordance with the total return concept. A distribution of endowment return that is independent of the cash yield and appreciation of investments earned during the year is provided for program support. The university has adopted an endowment spending policy designed specifically to stabilize annual spending levels and to preserve the real value of the endowment portfolio over time. The spending policy attempts to achieve these two objectives by using a long-term targeted spending rate combined with a smoothing rule, which adjusts spending gradually to changes in the endowment's fair value. An administrative charge is assessed against the funds when distributed.

To the extent that a donor restricted endowment fund falls below its historic dollar value a deficit would exist, and it would be reported as a reduction of net assets with donor restrictions. Spending from an endowment fund in a deficit position would continue under the spending policy so long as the fund is impaired less than 30% relative to its historical dollar value. There were no funds in a deficit position at June 30, 2019.

The university uses a long-term targeted spending rate of 5.25%. The spending amount is calculated using 80% of the previous year's spending and 20% of the targeted long-term spending rate applied to the fair value two years prior. The spending amount determined by the formula is adjusted for inflation and taxes and constrained so that the calculated rate is at least 4.0% and not more than 6.5% of the endowment's fair value. The actual rate of spending for 2019 and 2018, when measured against the previous year's June 30th endowment fair value, was 4.6% and 4.7%, respectively.

The university determines the expected return on endowment investments with the objective of producing a return exceeding the sum of inflation and the target spending rate. Asset allocation is the key factor driving expected return. Yale's asset allocation policy combines tested theory and informed market judgment to balance investment risks with the need for high returns. Both the need to provide resources for current operations and the desire to preserve the purchasing power of assets leads the endowment to be weighted toward equity.

The university manages the majority of its endowment in its Long Term Investment Pool (the "Pool"). The Pool is unitized and allows for efficient investment among a diverse group of funds with varying restricted purposes. In addition to university funds, the Pool includes assets of affiliated entities where the university has established investment management agreements.

e. Land, Buildings and Equipment

Land, buildings, and equipment are generally stated at cost. Buildings leased under capital leases are recorded at the lower of the net present value of the minimum lease payments or the fair value of the leased asset at the inception of the lease. Annual depreciation is calculated on a straight-line basis over useful lives, or over the lease term for capital leases, ranging from 15 to 50 years for buildings and improvements and 4 to 15 years for furnishings and equipment.

f. Other Assets

Other assets include an insurance receivable, capitalized software costs, deferred expenses, and inventories. Capitalized software costs are amortized on a straight line basis over the estimated useful lives of the software, ranging from 5 to 10 years.

g. Collections

Collections at Yale include works of art, literary works, historical treasures, and artifacts that are maintained in the university's museums and libraries. These collections are protected and preserved for public exhibition, education, research, and the furtherance of public service. Collections are not capitalized; purchases of collection items are recorded as expenses in the university's consolidated statement of activities in the period in which the items are acquired.

h. Split-Interest Agreements

The university's split-interest agreements with donors consist primarily of charitable gift annuities, pooled income funds, and irrevocable charitable remainder trusts for which the university serves as trustee. Assets are invested and payments are made to donors and/or other beneficiaries in accordance with the respective agreements.

Contribution revenue related to charitable gift annuities and charitable remainder trusts are recognized at the date the agreements are established. In addition, the fair value of the estimated future payments to be made to the beneficiaries under these agreements is recorded as a liability. For pooled income funds, contribution revenue is recognized upon establishment of the agreement at the fair value of the estimated future receipts, discounted for the estimated time period until culmination of the agreement.

i. Beneficial Interest in Trust Assets

The university is the beneficiary of certain perpetual trusts and charitable remainder trusts held and administered by others. The estimated fair values of trust assets are recognized as assets and as gift revenue when reported to the university.

j. Net Tuition, Room and Board

Tuition, room and board revenue is generated from an enrolled student population of approximately 13,400 and is recognized in the period in which it satisfies its performance obligations. Net tuition, room and board revenue from undergraduate enrollment represents approximately 59.4% of total tuition, room and board revenue in 2019.

The university maintains a policy of offering qualified applicants admission to Yale College without regard to financial circumstance, as well as meeting in full the demonstrated financial need of those admitted. Student need in all programs throughout the university is generally fulfilled through a combination of scholarships and fellowships, loans and employment during the academic year. Tuition, room and board revenue has been reduced by certain scholarships and fellowships in the amounts of $343.3 million and $304.4 million in 2019 and 2018, respectively.

k. Contributions

Unconditional promises to give that are expected to be collected within one year are recorded at their net realizable value. Amounts expected to be collected in future years are recorded at the present value of estimated future cash flows, which includes estimates for potential uncollectible receivables. The discount on those contributions is computed using an interest rate that reflects fair value applicable to the year in which the promise is received. Amortization of the discount is included in contribution revenue.

Contributions are considered conditional when the underlying agreement includes a performance barrier and a right of return or a right to release promised assets exists. Conditional promises to give are not recognized as revenue until the performance barrier and the right of return or release have been overcome.

l. Grant and Contract Income

The university receives grant and contract income for exchange and non-exchange agreements from both governmental and private sources. Revenue from exchange agreements is recognized when performance obligations are met. Revenue from conditional non-exchange agreements is recognized as performance barriers are overcome and as the university overcomes either a right of return of assets transferred or the right of release of a promisor’s obligation to transfer assets. Grant and contract revenue from conditional non-exchange agreements is generally recognized as qualified costs of sponsored programs are incurred. At June 30, 2019, the university has research activities which are contractually authorized by the sponsor, but for which costs have not yet been incurred, totaling $1,543.5 million.

In 2019 and 2018, grant and contract income received from the federal government totaled $612.0 million and $586.6 million, respectively. Recovery of facilities and administrative costs of federally sponsored programs is at rates negotiated with the university's cognizant agency, the Department of Health and Human Services.

m. Medical Services Income

The university provides medical care to patients primarily under agreements with third party-payors, including health maintenance organizations, that provide payment for medical services at amounts different from standard rates established by the university. The university determines performance obligations based on the nature of the services provided and recognizes revenue as it satisfies those performance obligations. Generally, these performance obligations are satisfied at the point in time the service is provided.

Medical services income is reported net of contractual discounts from third-party payors and of implicit price concessions to uninsured patients. The university estimates the discounts based on contractual agreements and estimates the implicit price concessions based on its historical collection experience with these classes of patients.

In 2019 and 2018, income from medical services totaled $447.9 million and $418.4 million for insurance companies, $143.9 million and $139.2 million for Medicare, and $62.6 million and $61.6 million for Medicaid, respectively.

n. Net Assets Released from Restrictions

Net assets released from restrictions are based upon the satisfaction of the purpose for which the net assets were restricted or the completion of a time stipulation. Restricted operating activity including contributions and net investment return earned, which are restricted, are reported as net assets with donor restrictions and reclassified to net assets without donor restrictions when any donor-imposed restrictions are satisfied. Non-operating restricted net assets associated with building costs are reclassified to net assets without donor restrictions when the capital asset is placed in service.

o. Self-Insurance

The university self-insures at varying levels for unemployment, disability, workers' compensation, property losses, certain healthcare plans, general liability, and professional liability; and obtains coverage through a captive insurance company for medical malpractice and related general liability losses. Insurance is purchased to cover liabilities above self-insurance limits. Estimates of retained exposures are accrued.

p. Tax Status

The university has been granted tax-exempt status under section 501(c)(3) of the Internal Revenue Code.

The Tax Cuts and Jobs Act (the "Act"), enacted on December 22, 2017, impacts the university in several ways, including the new excise taxes on net investment income and executive compensation, as well as updated rules for calculating unrelated business taxable income. The overall impact of the Act remains uncertain, and the full impact will not be known until further regulatory guidance is published. The university has recorded tax assets and liabilities in its consolidated financial statements based on reasonable estimates determined using current guidance. Management will continue to monitor regulatory developments and assess the future impact of the relevant provisions of the Act on the university's consolidated financial statements.

As a result of the Act's changes to the calculation of unrelated business taxable income, the university expects to use net operating loss ("NOL") carryforwards to offset future unrelated business taxable income. The university has recorded a deferred tax asset to reflect the expected benefit of these NOL carryforwards which will expire beginning in 2020 through 2037 if they are not used. The deferred tax asset is the portion of the benefit that is more likely than not to be realized based on management's evaluation of available regulatory guidance and its estimates of future taxable income. The amount of the deferred tax asset could be adjusted in the future if estimates of taxable income during the carryforward period are reduced or increased based on additional information, including the issuance of final regulations.

q. Estimates

The preparation of financial statements in accordance with accounting principles generally accepted in the United States of America ("GAAP") requires management to make estimates and judgments that affect the reported amounts of assets and liabilities and disclosures of contingencies at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period.

Significant estimates made by management include the valuation of alternative investments, the estimated net realizable value of receivables, estimated asset retirement obligations, liabilities under split-interest agreements, estimated tax liabilities and the valuation of the deferred tax asset resulting from provisions of the Act, and the actuarially determined employee benefit and self-insurance liabilities. Actual results could differ from those estimates.

r. Recent Authoritative Pronouncements

On July 1, 2018, the university adopted new guidance (1) Clarifying the Scope and Accounting Guidance for *Contributions Received and Contributions Made* effective for the fiscal year ended June 30, 2019, (2) *Revenue from Contracts with Customers* effective for the fiscal year ended June 30, 2019, and (a) evaluating whether transactions should be accounted for as contributions or exchange transactions and (b) determining whether a contribution is conditional. Under *Revenue from Contracts with Customers*, adopted using the modified retrospective approach, recognition of revenue from customer contracts is a principles-based framework. The impact of adopting the new guidance was not significant to the university's consolidated financial statements.

The Financial Accounting Standards Board has issued the *Leases* accounting standard that the university must adopt for the fiscal year ending June 30, 2020. The *Leases* standard aims to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. Leases will be classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the consolidated statement of activities. In conjunction with the adoption of this standard the university expects to record a right of use asset and a corresponding lease liability in the consolidated statement of financial position.

s. Summarized 2018 Financial Information

The 2019 consolidated financial statements include selected comparative summarized financial information for 2018. Such information does not include sufficient detail to constitute a presentation in conformity with GAAP. Accordingly, such information should be read in conjunction with the university's 2018 consolidated financial statements, from which the summarized financial information was derived. In addition, certain amounts have been reclassified to conform to the current year presentation.

2. Investments

The university endowment maintains a diversified investment portfolio with a strong orientation to equity investments and strategies designed to take advantage of market inefficiencies. The university's investment objectives are guided by its asset allocation policy and are achieved in partnership with external investment managers operating through a variety of investment vehicles, including separate accounts, limited partnerships and commingled funds. The university's heavy allocation to non-traditional asset classes, such as absolute return (hedge strategies), private equity (venture capital and leveraged buyouts), real estate, and natural resources (timber, energy and minerals), generates return potential and diversification in the portfolio.

The components of endowment and non-endowment investments, net of related liabilities at June 30 are presented below, in thousands of dollars:

	2019	2018
Endowment investments:		
Long term investment pool	$ 30,013,883	$ 29,088,879
Other	281,120	356,057
Total net endowment investments	30,295,003	29,444,936
Non-endowment investments:		
Long term investment pool	400,000	350,000
Bonds	526,137	549,866
Derivatives	(459,213)	(174,542)
Other	152,492	438,377
Total non-endowment investments	619,416	1,163,701
Net investments, at fair value	$ 30,914,419	$ 30,608,637

As described in Note 1d, investments are recorded at fair value. The following tables summarize the fair values of the university's investments by major type and related liabilities as of June 30, in thousands of dollars:

2019	Level 1	Level 2	Level 3	Total
Investments, at fair value:				
Cash and cash equivalents	$ 1,300,316	$ -	$ -	$ 1,300,316
Fixed income:				
US government securities	2,367,143	116	61	2,367,320
Foreign government securities	24,145	302,743	11,058	337,946
Corporate and other securities	50,118	2,542,451	253,072	2,845,641
Total fixed income	2,441,406	2,845,310	264,191	5,550,907
Common stock:				
Domestic	1,108,851	42,083	79,520	1,230,454
Foreign	1,642,821	106,236	102,423	1,851,480
Total common stock	2,751,672	148,319	181,943	3,081,934
Other equity investments:				
Venture capital	-	-	194,028	194,028
Natural resources	-	-	189,278	189,278
Total other equity investments	-	-	383,306	383,306
Other investments	475,609	1,283,593	315,942	2,075,144
Total leveled investments, at fair value	$ 6,969,003	$ 4,277,222	$ 1,145,382	12,391,607
Investments at net asset value				24,668,451
Total investments				37,060,058
Liabilities associated with investments:				
Securities sold, not yet purchased	$ 597,722	$ 694,431	$ -	1,292,153
Repurchase agreements	-	1,613,783	1,239	1,615,022
Other liabilities	265,027	1,020,862	1,245,164	2,531,053
Total liabilities associated with investments	$ 862,749	$ 3,329,076	$ 1,246,403	5,438,228
Non-controlling interests				707,411
Net investments				$ 30,914,419

2018	Level 1	Level 2	Level 3	Total
Investments, at fair value:				
Cash and cash equivalents	$ 614,547	$ -	$ -	$ 614,547
Fixed income:				
US government securities	1,988,449	58,759	58	2,047,266
Foreign government securities	12,934	162,459	-	175,393
Corporate and other securities	30,676	1,998,181	337,352	2,366,209
Total fixed income	2,032,059	2,219,399	337,410	4,588,868
Common stock:				
Domestic	1,496,324	42,298	22,024	1,560,646
Foreign	1,820,450	80,550	93,150	1,994,150
Total common stock	3,316,774	122,848	115,174	3,554,796
Other equity investments:				
Venture capital	-	-	169,949	169,949
Natural resources	-	-	210,163	210,163
Total other equity investments	-	-	380,112	380,112
Other investments	741,675	941,655	336,374	2,019,704
Total leveled investments, at fair value	$ 6,705,055	$ 3,283,902	$ 1,169,070	11,158,027
Investments at net asset value				23,955,684
Total investments				35,113,711
Liabilities associated with investments:				
Securities sold, not yet purchased	$ 382,815	$ 333,560	$ -	716,375
Repurchase agreements	-	832,610	-	832,610
Other liabilities	299,524	698,425	1,244,797	2,242,746
Total liabilities associated with investments	$ 682,339	$ 1,864,595	$ 1,244,797	3,791,731
Non-controlling interests				713,343
Net investments				$ 30,608,637

While not part of a leveling category, fair values for certain investments held are based on the net asset value ("NAV") of such investments as determined by the respective external investment managers, including general partners, if market values are not readily ascertainable. These valuations necessarily involve assumptions and methods that are reviewed by the Investments Office.

Investments at NAV as of June 30, in thousands of dollars, include:

	2019	2018
Absolute return	$ 5,372,169	$ 5,707,245
Domestic	467,482	898,522
Foreign	2,721,844	2,593,255
Leveraged buyout	4,977,975	4,310,722
Natural resources	1,259,534	1,720,329
Real estate	3,119,090	3,012,179
Venture capital	6,750,357	5,713,432
Total investments, at NAV	$ 24,668,451	$ 23,955,684

Assets and liabilities of investment companies that are controlled by the university are consolidated for reporting purposes. Certain consolidated subsidiaries are controlled but not wholly owned by the university. The portion of a consolidated entity's net assets that is not owned by the university is reported as a non-controlling interest.

The fair value of consolidated investment company assets and liabilities included in the university's consolidated financial statements, in thousands of dollars, include:

		2019		2018
Consolidated investment company assets	$	6,362,187	$	5,467,241
Consolidated investment company liabilities		3,089,803		1,965,031
	$	3,272,384	$	3,502,210

Level 3 investments are valued by the university or by its external investment managers using valuation techniques standard in the industry in which they operate. The Investments Office reviews these valuation methods and evaluates the appropriateness of these valuations each year. In certain circumstances, when the general partner does not provide a valuation or the valuation provided is not considered appropriate, the Investments Office will determine those values.

The following table summarizes quantitative inputs and assumptions used for Level 3 investments at June 30, 2019 for which fair value is based on unobservable inputs that are not developed by external investment managers. Significant increases or decreases in these unobservable inputs may result in significantly higher or lower valuation results.

Asset Class		Fair Value (in 000's)	Valuation Technique	Significant Unobservable Input	Range	Weighted Average
Equity securities	$	181,943	Market comparables	Enterprise value/assets	0.8% - 3.0%	1.5%
			Price of recent investment	Price of recent round in private investment	+/- 10.0%	8.34%/ (8.34%)
			Dealer pricing	Indicative quotes	NA	NA
			Liquidation model	Liquidation probability	15.0% - 35.0%	25.0%
Fixed income securities	$	264,191	Bank debt model	Discount rate	9.0% - 14.0%	11.0%
			Bond model	Discount rate	7.0% - 11.0%	9.0%
			Dealer pricing	Indicative quotes	NA	NA
Natural resources	$	189,278	Discounted cash flow	Discount rate	8.0% -12.0%	10.0%
Trusts	$	193,753	Net present value	Discount rate	2.8%	2.8%
Other investments	$	316,217	Market comparables	Price per acre	$8,834.00 - $9,164.00	$9,000.00
			Write-off	Recovery rate	30.0% - 70.0%	50.0%
			Dealer pricing	Indicative quotes	NA	NA
			Put model	Volatility	50.0%	50.0%
Liabilities	$	(1,246,403)	Various methods	University pooled unit market value	$ 3,696.07	$ 3,696.07

The valuation process for investments at NAV and those categorized in Level 3 of the fair value hierarchy includes evaluating the operations and valuation procedures of external investment managers and the transparency of those processes through background and reference checks, attendance at investor meetings, and periodic site visits. In determining the fair value of investments, Investments Office staff reviews periodic investor reports, interim and annual audited financial statements received from external investment managers, and material quarter over quarter changes in valuation; and assesses the impact of macro market factors on the performance. The Investments Office meets with the Corporation's Investment Committee quarterly to review investment transactions and monitor performance of external investment managers.

Realized gains and losses are reported in total endowment return, net of fees. Included in net realized and unrealized gain (loss) in Level 3 reported below were unrealized losses of ($26.2) million and unrealized gains of $36.7 million that relate to assets held at June 30, 2019 and 2018, respectively.

The tables below present the change in fair value measurements for the university's Level 3 investments during the years ended June 30, in millions of dollars:

2019	Venture Capital	Natural Resources	Other	Liabilities	Total
Beginning balance	$ 170	$ 210	$ 789	$ (1,245)	$ (76)
Realized and unrealized gain (loss), net	36	(30)	(10)	(12)	(16)
Purchases	7	32	204	(15)	228
Sales	(8)	(23)	(225)	26	(230)
Transfers in	99	-	77	-	176
Transfers out	(110)	-	(73)	-	(183)
Ending balance	$ 194	$ 189	$ 762	$ (1,246)	$ (101)

2018	Venture Capital	Natural Resources	Other	Liabilities	Total
Beginning balance	$ 115	$ 256	$ 780	$ (1,310)	$ (159)
Realized and unrealized gain (loss), net	38	12	25	(40)	35
Purchases	3	18	132	(10)	143
Sales	(1)	(2)	(118)	103	(18)
Transfers in	21	-	69	(2)	88
Transfers out	(6)	(74)	(99)	14	(165)
Ending balance	$ 170	$ 210	$ 789	$ (1,245)	$ (76)

The transfers out of Level 3 consist primarily of investments reclassified from Level 3 to investments at NAV due to the use of the practical expedient for certain limited partnership investments.

Agreements with external investment managers include certain redemption terms and restrictions as noted in the following table:

Asset Class		Fair Value (in 000's)	Remaining Life		Unfunded Commitment (in 000's)	Redemption Terms	Redemption Restrictions
Absolute return	$	5,372,169	No Limit	$	45,567	Redemption terms range from monthly with 30 days notice to annually with 90 days notice.	Lock-up provisions range from none to 5 years.
Domestic equity		467,482	No Limit		-	Redemption terms range from monthly with 3 days notice to annually with 90 days notice.	Lock-up provisions range from none to 7 years.
Foreign equity		2,721,844	No Limit		120,750	Redemption terms range from monthly with 15 days notice to closed end structures not available for redemption.	Lock-up provisions range from none to 7 years.
Leveraged buyout		4,977,975	1-25 years		3,591,298	Closed end funds not eligible for redemption.	Not redeemable.
Venture capital		6,944,385	1-25 years		1,441,745	Redemption terms range from 2 years with 3 years notice to closed end structures not available for redemption.	Not redeemable.
Real estate		3,119,090	1-25 years		2,200,956	Closed end funds not eligible for redemption.	Not redeemable.
Natural resources		1,448,812	1-35 years		534,802	Closed end funds not eligible for redemption.	Not redeemable.
Total	$	25,051,757		$	7,935,118		

The university enters into resell agreements (where securities are purchased under agreements to resell) and into repurchase agreements (where securities are sold under an agreement to repurchase). All resell agreements and repurchase agreements are carried at their contractual value which approximates fair value. Resell and repurchase agreements are presented gross in the university's consolidated statement of financial position as investment assets and liabilities associated with investments.

The table below illustrates the exposure for these financial instruments at June 30, 2019, in thousands of dollars, where enforceable netting agreements are in place:

		Assets		Liabilities
Resell and repurchase agreements	$	805,538	$	1,615,022
Amounts contractually eligible for offset		(692,938)		(692,938)
Collateral		(97,818)		(922,084)
Net exposure for resell and repurchase agreements	$	14,782	$	-

The fair value of fixed income securities of $1,267.0 million was provided at June 30, 2019 to collateralize securities sold, not yet purchased.

The university may employ derivatives and other strategies to (1) manage against market risks, (2) arbitrage mispricings of related securities, and (3) replicate long or short positions more cost effectively.

The university does not invest in derivatives for speculation. The fair value of derivative positions held at June 30, 2019 and related gain (loss) for the year, in thousands of dollars, were as follows:

	Assets	Liabilities	Gain (Loss)
Endowment:			
Credit default swaps	$ 95,741	$ (108,923)	$ (693)
Interest rate swaps	109,164	(149,446)	(15,591)
Other	63,249	(49,440)	(74,685)
	268,154	(307,809)	(90,969)
Other:			
Interest rate swaps	19,639	(490,243)	(306,958)
Energy swaps	-	(407)	148
	19,639	(490,650)	(306,810)
Gross value of derivatives	287,793	(798,459)	$ (397,779)
Other-counterparty netting	(219,627)	219,627	
Net collateral (received)/posted	(38,817)	491,408	
Total net exposure for derivatives	$ 29,349	$ (87,424)	

Derivatives are reported as other investments and other liabilities for fair value leveling purposes. The university initiates derivatives under legally enforceable master netting agreements. The net exposure for derivatives is presented above net of these master netting agreements and required collateral.

Credit default swaps

Credit default swaps are used to simulate long or short positions that are unavailable in the market or to reduce credit risk where exposure exists. The buyer of a credit default swap is obligated to pay to the seller a periodic stream of payments over the term of the contract in return for a contingent payment upon occurrence of a contracted credit event. As of June 30, 2019, the total notional amount of credit default swap contracts for buy protection amounts to $2.9 billion and the notional amount related to sell protection is $1.0 billion.

Interest rate swaps

Interest rate swaps are used to manage exposure to interest rate fluctuations. The notional amount of contracts that pay based on fixed rates and receive based on variable rates at June 30, 2019 were $9.2 billion. The notional amount of contracts that pay based on variable rates and receive based on fixed rates were $10.9 billion at June 30, 2019.

Energy swaps

Energy swaps are used in connection with settling planned purchases of energy consumption and adjusting market exposures.

Derivative assets are reported as investments in the consolidated statement of financial position and derivative liabilities are reported as liabilities associated with investments. Gains and losses on derivatives used for investing are reported as part of total endowment return and gains and losses related to university debt management and energy consumption are reported as other investment (loss) income in the consolidated statement of activities as non-operating activity.

Derivatives held by limited partnerships and commingled investment trusts in which Yale invests pose no off-balance sheet risk to the university due to the limited liability structure of the investments.

Certain investment transactions, including derivative financial instruments, necessarily involve counterparty credit exposure. Such exposure is monitored regularly by the university's Investments Office in accordance with established credit policies and other relevant criteria.

Endowment investments include beneficial interests in outside trusts of $151.8 million and $156.4 million at June 30, 2019 and 2018, respectively. Non-endowment investments include Connecticut Health and Educational Facilities Authority ("CHEFA") proceeds available for approved construction and campus renovation projects. There were no outstanding CHEFA proceeds at June 30, 2019 and $76.0 million at June 30, 2018.

The following investments held under split-interest agreements are included in the endowment investment portfolio, in thousands of dollars:

	2019	2018
Charitable gift annuities	$ 227,355	$ 227,170
Charitable remainder trusts	104,058	107,652
Pooled income funds	6,826	9,524
	$ 338,239	$ 344,346

Split interest liabilities reported in the consolidated statement of financial position total $144.1 million and $138.6 million at June 30, 2019 and 2018, respectively, and are recorded at fair value using Level 2 measurements.

The university has agreements with certain affiliates to invest in the Pool. The obligation to these affiliates included in other liabilities within liabilities associated with investments is $1,160.8 million and $1,171.7 million at June 30, 2019 and 2018, respectively. The largest balance recorded is for Yale-New Haven Health System ("YNHHS") with $916.0 million and $931.7 million invested at June 30, 2019 and 2018, respectively.

A summary of the university's total investment return as reported in the consolidated statement of activities is presented below, in thousands of dollars:

	2019	2018
Investment income	$ 455,594	$ 387,654
Realized and unrealized gain, net of investment management fees	1,174,398	2,890,256
Total endowment return	1,629,992	3,277,910
Other investment (loss) income	(206,980)	218,966
	$ 1,423,012	$ 3,496,876

Endowment investment returns totaling $1,354.6 million and $1,282.1 million were allocated to operating activities in 2019 and 2018, respectively, using the spending policy described in Note 1d.

3. Accounts Receivable

Accounts receivable from the following sources were outstanding at June 30, in thousands of dollars:

	2019	2018
Medical services, net	$ 95,906	$ 117,706
Grant and contracts	105,743	107,143
Affiliated organizations	79,877	64,494
Publications	6,551	5,345
Other	33,597	24,216
	321,674	318,904
Less: Allowance for doubtful accounts	(22,001)	(57,262)
	$ 299,673	$ 261,642

Medical services receivables are net of discounts and allowances of $159.8 million and $118.2 million at June 30, 2019 and 2018, respectively. In connection with the adoption of the new accounting guidance for revenue from contracts with customers, the university changed its presentation of the allowance for doubtful accounts associated with medical services accounts receivable. For 2019 this amount is netted against medical service receivables. For 2018 it is presented in the allowance for doubtful accounts. Receivables for medical services, net of contractual adjustments, are primarily based on negotiated contracts with insurance companies (36%), Medicare (12%), Medicaid (4%), payments due directly from patients (38%) and commercial insurance and others (10%). The university assesses credit losses on certain accounts receivable on a regular basis to determine the allowance for doubtful accounts.

The university and Yale-New Haven Hospital (the "Hospital") are parties to an affiliation agreement that establishes guidelines for the operation of activities between these two separate organizations. These guidelines set forth each organization's responsibility under the common goal of delivering comprehensive patient care services. The university provides professional services from faculty of the Yale School of Medicine and a variety of other administrative and clinical services. The net receivable from the Hospital amounted to $68.1 million and $50.8 million at June 30, 2019 and 2018, respectively. Balances are settled in the ordinary course of business. The university recognized $341.4 million and $289.2 million in revenue and incurred $115.0 million and $93.5 million in expenses related to activities with the Hospital during the periods ended June 30, 2019 and 2018, respectively.

4. Contributions Receivable

Contributions receivable consist of the following unconditional promises to give as of June 30, in thousands of dollars:

		2019		2018
Purpose:				
Operating programs	$	435,821	$	390,164
Endowment		348,196		186,688
Capital purposes		107,000		135,678
Gross unconditional promises to give		891,017		712,530
Less: Discount to present value		(139,539)		(136,574)
Allowance for uncollectible accounts		(81,017)		(64,212)
	$	670,461	$	511,744

		2019		2018
Amounts due in:				
Less than one year	$	235,612	$	230,971
One to five years		350,879		211,038
More than five years		304,526		270,521
	$	891,017	$	712,530

Discount rates used to calculate the present value of contributions receivable ranged from 0.33% to 7.00% at June 30, 2019 and 2018.

At June 30, 2019, the university had conditional pledges of approximately $73.4 million that are subject to a donor-imposed condition.

5. Notes Receivable

Notes receivable at June 30, in thousands of dollars, include:

		2019		2018
Institutional student loans	$	46,627	$	47,211
Federally-sponsored student loans		23,115		27,117
Notes receivable		52,337		52,548
		122,079		126,876
Less: Allowance for doubtful accounts		(11,655)		(11,280)
	$	110,424	$	115,596

Student Loans

Institutional student loans include donor funds restricted for student loan purposes and university funds made available to meet demonstrated need in excess of all other sources of student loan borrowings. Interest accrues at fixed rates upon loan disbursement.

Management regularly assesses the adequacy of the allowance for credit losses for student loans by performing ongoing evaluations of the student loan portfolio, including such factors as the differing economic risks associated with each loan category, the financial condition of specific borrowers, the level of delinquent loans, and, where applicable, the existence of any guarantees or indemnifications. Federally-sponsored loans represent amounts due from current and former students under certain federal loan programs. Loans disbursed under these programs can be assigned to the federal government in certain non-repayment situations. In these situations, the federal portion of the loan balance is guaranteed. Federally-sponsored student loans have mandated interest rates and repayment terms subject to restrictions as to their transfer and disposition.

Amounts received from the federal government to fund a portion of the federally-sponsored student loans are ultimately refundable to the federal government and have been reported as advances from federal government for student loans in the consolidated statement of financial position. The recorded value of student loan instruments approximates fair value.

Notes Receivable

The university and the Hospital entered into an agreement under which the Hospital will reimburse the university over a 40-year term for advances made relating to the construction of Hospital facilities. The payment includes interest based on the five-year Treasury bill plus 175 basis points, which resets every five years. In 2015, the interest rate was reset, and the monthly payment was adjusted accordingly.

6. Other Assets

Other assets at June 30, in thousands of dollars, include:

	2019	2018
Insurance receivable	$ 96,119	$ 97,364
Software costs, net of accumulated amortization	42,330	47,430
Deferred expenses	70,466	30,996
Inventories	14,628	14,963
	$ 223,543	$ 190,753

Amortization expense related to other assets included in operating expenses amounted to $13.5 million and $13.7 million in 2019 and 2018, respectively.

7. Land, Buildings and Equipment

Land, buildings and equipment at June 30, less accumulated depreciation and amortization, in thousands of dollars, are as follows:

	2019	2018
Land and real estate improvements	$ 137,053	$ 137,053
Buildings	7,124,734	6,889,549
Buildings under capital leases	129,746	50,058
Equipment	614,278	618,119
	8,005,811	7,694,779
Less: Accumulated depreciation and amortization	(3,188,589)	(2,962,493)
	4,817,222	4,732,286
Construction in progress	537,295	359,405
	$ 5,354,517	$ 5,091,691

Depreciation expense included in operating expenses amounted to $270.4 million and $256.4 million in 2019 and 2018, respectively. Amortization expense on capital lease assets amounted to $4.1 million and $1.9 million in 2019 and 2018, respectively.

8. Other Liabilities

Other liabilities consist of obligations of the university that will be paid over extended periods and consist of the following, in thousands of dollars:

	2019	2018
Employee benefit obligations	$ 1,622,551	$ 977,271
Compensated absences	67,289	65,440
Financial aid grant obligations	64,534	59,774
Asset retirement obligations	39,100	39,100
Other	205,890	169,287
	$ 1,999,364	$ 1,310,872

Included in employee benefit obligations are defined benefit plan liabilities in excess of plan assets. These liabilities amounted to $1,441.3 million at June 30, 2019 and $815.5 million at June 30, 2018 (see Note 11).

9. Bonds and Notes Payable

Bonds and notes payable outstanding at June 30, in thousands of dollars, include:

	Effective Interest Rate June 30, 2019	Calendar Year of Maturity	Outstanding Balance 2019	2018
CHEFA tax-exempt bonds:				
Series S	5.00%	2027	$ 111,205	$ 135,865
Series T	1.65%	2029	125,000	125,000
Series U	2.00%	2033	250,000	250,000
Series V	1.26%	2036	200,000	200,000
Series X	1.80%	2037	125,000	125,000
Series 2010A	1.90%	2049	300,000	379,975
Series 2013A	1.00%	2042	100,000	100,000
Series 2014A	1.30%	2048	250,000	250,000
Series 2015A	2.05%	2035	300,000	300,000
Series 2016A	1.62%	2042	399,320	399,320
Series 2017A	5.00%	2042	170,920	170,920
Series 2017B	5.00%	2029/2037	224,200	224,200
Series 2017C	5.00%	2040/2057	383,380	383,380
Series 2018A	5.00%	2025	67,610	-
Total CHEFA bonds			3,006,635	3,043,660
Medium-term notes	7.38%	2096	125,000	125,000
Medium-term notes Series B	-	2019	-	250,000
Commercial paper	1.82%	2019	500,000	181,445
Capital leases - buildings	4.17%	2032/2044	169,581	39,623
U.S. Department of Energy	2.71%	2029	43,891	48,797
Other notes payable	7.85%	2020	605	1,020
Principal amount			3,845,712	3,689,545
Less: Bond issue costs			(12,359)	(13,271)
Plus: Unamortized premiums and discounts, net			111,600	108,603
			$ 3,944,953	$ 3,784,877

CHEFA Tax-Exempt Bonds

The university borrows at tax-exempt rates through CHEFA, a conduit issuer. CHEFA debt is a general unsecured obligation of the university. Although CHEFA is the issuer, the university is responsible for the repayment of the tax-exempt debt.

Series S bonds consist of $111.2 million maturing in July 2027. In February 2019, the Series S-1 and S-2 bonds, totaling $135.9 million, were remarketed as a single Series S. The principal was reduced and it was converted from a variable money market municipal interest rate to a fixed interest rate of 5.00%. These bonds include a net premium of $23.4 million as of June 2019.

Series T bonds consist of $125.0 million Series T-2 bonds maturing in July 2029. The Series T-2 bonds bear a fixed interest rate of 1.65% through February 2020.

Series U bonds consist of 1) $125.0 million Series U-1 bonds and 2) $125.0 million Series U-2 bonds. In February 2019, both series were remarketed from a fixed interest rate of 1.00% to a fixed interest rate of 2.00% through February 7, 2022 and mature in July 2033.

Series V bonds consist of $200.0 million, bear interest at a daily rate, and mature in July 2036. The bonds may be converted from a daily rate period to other variable rate modes or to a fixed rate mode at the discretion of the university.

Series X bonds consist of $125.0 million Series X-2 bonds maturing in July 2037. In February 2018, the Series X-2 bonds were remarketed from a fixed interest rate of 0.90%, to a fixed interest rate of 1.80% through January 2021.

Series 2010A bonds consist of 1) $150.0 million Series 2010A-3 bonds, maturing July 2049, that were remarketed from an interest rate of 0.875% that expired in February 2018 to a fixed interest rate of 1.80% through February 2021; and 2) $150.0 million Series 2010A-4 bonds, maturing July 2049, that were remarketed from a fixed interest rate of 1.20% that expired in January 2019 to a fixed interest rate of 2.00% through February 2022. In July 2018 $80.0 million Series 2010A-1 bonds were redeemed by new Series 2018A bonds in the amount of $67.6 million (see Series 2018A below). In December 2017 $150.0 million Series 2010A-2 bonds were redeemed by new Series 2017C-1 bonds in the amount of $150.0 million (see Series 2017C-1 below).

Series 2013A bonds consist of $100.0 million maturing in July 2042. In July 2019, the Series 2013A bonds were remarketed from a fixed interest rate of 1.00% to a fixed interest rate of 1.45% through June 2022.

Series 2014A bonds consist of $250.0 million maturing in July 2048. In July 2017, the Series 2014A bonds were remarketed from a fixed interest rate of 0.80% to a fixed interest rate of 1.30% through February 2020.

Series 2015A bonds consist of $300.0 million maturing in July 2035. In July 2018, the Series 2015A bonds were remarketed from a fixed interest rate of 1.38% to a fixed interest rate of 2.05% through July 2021.

Series 2016A bonds consist of 1) $150.0 million Series 2016A-1 bonds bearing a fixed interest rate of 1.00% through June 30, 2019; and 2) $249.3 million Series 2016A-2 bonds bearing a fixed interest rate of 2.00% through June 30, 2026. Both bond series mature in July 2042. In July 2019, the Series 2016A-1 bonds were remarketed to a fixed interest rate of 1.45% through June 2022.

Series 2017A bonds consist of 1) $85.5 million Series 2017A-1 bonds and 2) $85.5 million Series 2017A-2 bonds. Both bond series mature in July 2042 and bear a fixed interest rate of 5.00% through June 30, 2022. These bonds include a net premium of $17.4 million as of June 30, 2019.

Series 2017B bonds consist of 1) $112.1 million Series 2017B-1 bonds maturing in July 2029 and 2) $112.1 million Series 2017B-2 bonds maturing in July 2037. Both bond series bear a fixed interest rate of 5.00% through June 30, 2020. These bonds include a net premium of $8.6 million as of June 30, 2019.

Series 2017C-1 bonds were issued in December 2017 to refund Series 2010A-2 bonds and consist of $123.3 million maturing in July 2040. The bonds bear a fixed interest rate of 5.00% through January 2028. These bonds include a net premium of $25.1 million as of June 30, 2019. Series 2017C-2 bonds were issued in December 2017 and consist of $260.1 million maturing in July 2057. The bonds bear a fixed interest rate of 5.00% through January 2023. These bonds include a net premium of $28.1 million as of June 30, 2019.

Series 2018A bonds were issued in July 2018 to refund Series 2010A-1 bonds and consist of $67.6 million maturing in July 2025. The bonds bear a fixed interest rate of 5.00%. These bonds include a net premium of $10.6 million as of June 30, 2019.

Notes Payable

Medium-term notes bear a fixed interest rate of 7.38% and mature in 2096, with an optional redemption provision in the year 2026. The discount associated with these notes was $251 thousand as of June 30, 2019.

Medium-term notes Series B bore a fixed interest rate of 2.09% and were redeemed in April 2019.

Commercial paper consists of notes issued in the short-term taxable market and is sold at a discount from par. In April 2019, additional commercial paper was issued and the proceeds were partially used to redeem $250.0 million of medium term notes Series B. The maturities of individual notes are issued in ranges from one day to no more than one year and fall on average in a range of thirty to sixty days.

Certain lease agreements entered into by the university qualify as capital leases with obligations of $169.6 million and $39.6 million at June 2019 and 2018, respectively. The agreements call for the university to lease the buildings through 2032 and 2044.

The university financed a wind energy project, Record Hill Wind, LLC, through a financing arrangement with the US Department of Energy. The financing arrangement is non-recourse debt to the university and bears interest at rates ranging from 2.24% to 2.78%.

Scheduled maturities of the debt obligations, in thousands of dollars, are as follows:

2020	$	507,044
2021		6,914
2022		6,927
2023		7,108
2024		7,301
Thereafter		3,310,418
Total	$	3,845,712

Certain CHEFA Series are subject to tender by bondholders. To the extent all bonds subject to tender could not be remarketed, $2.6 billion of bonds scheduled for maturity between 2029 and 2057 would be due when tendered.

Total interest expense incurred on indebtedness was $72.5 million and $58.1 million in 2019 and 2018, respectively. Interest capitalized to land, buildings and equipment totaled $5.7 million and $4.1 million in 2019 and 2018, respectively. Amortization expense related to bond issue costs included in operating expenses amounted to $1.8 million and $1.0 million in 2019 and 2018, respectively.

10. Retirement Plans – Defined Contribution

The university maintains defined contribution plans for faculty and certain staff employees. Participants may direct employee and employer contributions to annuities, mutual funds, and other investment options. Retirement expense for this plan was $124.9 million and $115.9 million in 2019 and 2018, respectively.

11. Pension and Postretirement Plans – Defined Benefit

The university has a noncontributory, defined benefit pension plan for staff. The staff pension plan provides payments based on the employee's earnings and years of participation.

In addition, the university provides postretirement benefits including health benefits based on years of service, life insurance, and a pay-out of unused sick time. While the university's subsidy of the cost of comprehensive health care benefits differs among retiree groups, substantially all employees who meet minimum age and service requirements and retire from the university are eligible for these benefits. Non-faculty employees are paid 50% of unused sick time and receive life insurance benefits upon retirement from active status.

The university uses a June 30th measurement date for its defined benefit plans.

The following table sets forth the pension and postretirement plans' funded status that is reported in the consolidated statement of financial position at June 30, in thousands of dollars:

	Pension		Postretirement	
	2019	2018	2019	2018
Change in benefit obligation:				
Benefit obligation, beginning of year	$ 1,658,508	$ 1,699,411	$ 1,137,991	$ 1,196,520
Service cost, excluding assumed administrative expenses	56,850	60,804	42,109	49,398
Interest cost	68,036	66,797	46,238	46,567
Benefit payments	(53,477)	(74,401)	(29,568)	(28,946)
Settlements	(156,700)	-	-	-
Assumption changes	358,524	(92,081)	270,442	(44,346)
Actuarial loss (gain)	17,159	(2,022)	(44,616)	(81,202)
Benefit obligation, end of year	$ 1,948,900	$ 1,658,508	$ 1,422,596	$ 1,137,991
Change in plan assets:				
Fair value, beginning of year	$ 1,487,183	$ 1,329,042	$ 493,791	$ 463,027
Actual return on plan assets	33,266	153,370	15,262	56,987
University contributions	107,998	81,844	36,233	3,934
Benefits and expenses paid	(56,136)	(77,073)	(30,684)	(30,157)
Settlements	(156,700)	-	-	-
Fair value, end of year	$ 1,415,611	$ 1,487,183	$ 514,602	$ 493,791
Funded Status	$ (533,289)	$ (171,325)	$ (907,994)	$ (644,200)

Benefit Obligation

The benefit obligation represents the actuarial present value of future payments to plan participants for services rendered prior to that date, based on the pension benefit formula. In calculating the value, the participants' compensation levels are projected to retirement**.**

The accumulated benefit obligation differs from the benefit obligation above in that it does not consider assumptions about future compensation levels. It represents the actuarial present value of future payments to plan participants using current and past compensation levels. The accumulated benefit obligation for the pension plan was $1,654.0 million at June 30, 2019 and $1,447.0 million June 30, 2018, respectively.

In January 2019, the staff pension plan purchased a group annuity contract from a third party to settle a portion of its obligation to certain pension plan participants.

Assumptions used in determining the year end obligation of the pension and postretirement plans are:

	2019	2018
Weighted-average discount rate - all plans except unused sick pay plan	3.10%	4.30%
Weighted-average discount rate - unused sick pay plan	2.85%	4.00%
Weighted-average increase in future compensation levels	3.14%	3.20%
Projected health care cost trend rate (pre-65/post-65)	6.66% / 12.40%	7.08% / 6.89%
Ultimate trend rate (pre-65/post-65)	4.50% / 4.50%	4.50% / 4.31%
Year ultimate trend rate is achieved	2028	2028
Mortality	RP2014 Aggregate, Scale MP2014	RP2014 Aggregate, Scale MP2014

In 2019, the university revised its methodology for determining the interest rates it uses to discount the pension and postretirement obligations, primarily because of the changing demographics of benefit plan participants. This change in methodology was the primary reason, combined with a lower interest rate environment, for the reduction in the discount rate.

The health care cost trend rate assumption has a significant effect on the amounts reported. For the fiscal year ended June 30, 2019, a one percent change in the health care cost trend rate would affect 2019 as follows, in thousands of dollars:

	One percent Increase	One percent Decrease
Effect on 2019 postretirement service and interest cost	$ 19,400	$ (13,400)
Effect on postretirement benefit obligation at June 30, 2019	250,000	(177,000)

Changes in assumptions during the year resulted in an increase to the pension benefit obligation and an increase to the postretirement benefit obligation at June 30, 2019, as follows, in thousands of dollars:

	Pension	Postretirement	Total
Salary increase rates	$ (3,401)	$ (64)	$ (3,465)
Inflation	(96)	(1,491)	(1,587)
Discount rate	368,580	280,979	649,559
Demographic changes	(6,559)	(8,982)	(15,541)
	$ 358,524	$ 270,442	$ 628,966

Net Periodic Benefit Cost

Net periodic benefit cost for the plans includes the following components, in thousands of dollars:

	Pension		Postretirement	
	2019	2018	2019	2018
Service cost	$ 56,850	$ 60,804	$ 42,109	$ 49,398
Administrative expenses	2,700	2,500	1,300	1,100
Interest cost	68,036	66,797	46,238	46,567
Expected return on plan assets	(101,485)	(103,010)	(34,070)	(33,930)
Net amortization:				
Prior service cost	3,343	3,343	21	50
Net loss	606	10,123	6	7,586
Net periodic benefit cost	30,050	40,557	55,604	70,771
Settlement charge	20,652	-	-	-
Total expense	$ 50,702	$ 40,557	$ 55,604	$ 70,771

The service cost component of net periodic benefit cost is included in employee benefits as a part of operating expenses in the consolidated statement of activities. The components of net periodic benefit cost, other than service cost, are included in other increases (decreases), which is reported as non-operating activity in the consolidated statement of activities.

Assumptions used in determining the net periodic benefit cost of the pension and postretirement plans are:

	2019	2018
Weighted-average discount rate	4.30%	4.00%
Expected long-term rate of return	7.25%	7.75%
Weighted-average compensation increase	3.20%	3.28%
Health care cost increase (pre-65/post-65)	7.08% / 6.89%	7.30% / 6.48%
Ultimate trend rate (pre-65/post-65)	4.50% / 4.31%	4.50% / 4.27%
Year ultimate trend rate is achieved	2028	2028
Mortality	RP2014 Aggregate, Scale MP2014	RP2014 Aggregate, Scale MP2014

The funded status consists of the cumulative unfunded net periodic benefit cost and the cumulative change in funding status of defined benefit plans. The components of the change in funding status of defined benefit plans, which is reported in non-operating results, for the year ended June 30, in thousands of dollars, include:

2019	Pension	Postretirement	Total
Unrecognized net actuarial loss	$ 443,865	$ 244,450	$ 688,315
Amortization of unrecognized obligation	(24,602)	(27)	(24,629)
	$ 419,263	$ 244,423	$ 663,686

2018	Pension	Postretirement	Total
Unrecognized net actuarial loss	$ (144,292)	$ (148,490)	$ (292,782)
Amortization of unrecognized obligation	(13,467)	(7,635)	(21,102)
	$ (157,759)	$ (156,125)	$ (313,884)

The cumulative amounts of these adjustments reported as deductions to net assets in the consolidated statement of financial position at June 30, in thousands of dollars, include:

2019		Pension		Postretirement		Total
Unrecognized net actuarial loss	$	540,114	$	318,988	$	859,102
Unrecognized prior service cost		14,044		1		14,045
	$	554,158	$	318,989	$	873,147

2018		Pension		Postretirement		Total
Unrecognized net actuarial loss	$	117,508	$	74,544	$	192,052
Unrecognized prior service cost		17,387		22		17,409
	$	134,895	$	74,566	$	209,461

Amounts recorded as an adjustment at June 30, 2019 that are expected to be amortized into non-operating activity during fiscal year 2020, in thousands of dollars, include:

		Pension		Postretirement		Total
Net actuarial loss	$	29,361	$	12,162	$	41,523
Prior service cost		3,343		1		3,344
	$	32,704	$	12,163	$	44,867

Actuarial gains or losses and prior service costs resulting from plan amendments are amortized over the average remaining years of service of active participants.

Plan Assets

The defined benefit plan assets are valued utilizing the same fair value hierarchy as the university's investments as described in Note 1d.

The following table summarizes the fair values of investments by major type held by the staff pension plan at June 30, in thousands of dollars:

		Level 1		Level 2		Level 3		2019		2018
Investments, at fair value:										
Cash and cash equivalents	$	111,261	$	-	$	-	$	111,261	$	23,399
US government securities		113,231		-		-		113,231		116,965
Equity investments:										
Domestic		21,844		-		-		21,844		17,040
Foreign		1,490		34,987		-		36,477		46,797
Total equity investments		23,334		34,987		-		58,321		63,837
Limited partnerships:										
Natural resources		-		-		11,329		11,329		12,101
Total limited partnerships		-		-		11,329		11,329		12,101
Other investments		4		-		-		4		-
Total leveled investments	$	247,830	$	34,987	$	11,329		294,146		216,302
Investments at NAV								1,138,881		1,270,982
Total investments, at fair value								1,433,027		1,487,284
Liabilities associated with investments	$	17,278	$	138	$	-		17,416		101
Net investments, at fair value							$	1,415,611	$	1,487,183

The following table summarizes the fair values of investments by major type held by the retiree health plan at June 30, in thousands of dollars:

	Level 1	Level 2	Level 3	2019	2018
Investments, at fair value:					
Cash and cash equivalents	$ 43,604	$ -	$ -	$ 43,604	$ 14,066
US government securities	20,611	-	-	20,611	19,492
Equity investments:					
Domestic	18,079	-	-	18,079	8,203
Foreign	899	7,138	-	8,037	13,553
Total equity investments	18,978	7,138	-	26,116	21,756
Limited partnerships:					
Natural resources	-	-	156	156	1,008
Total limited partnerships	-	-	156	156	1,008
Total leveled investments	$ 83,193	$ 7,138	$ 156	90,487	56,322
Investments at NAV				426,302	443,352
Total investments, at fair value				516,789	499,674
Liabilities associated with investments	$ 90	$ 34	$ -	124	3,559
Net investments, at fair value				$ 516,665	$ 496,115

The table below represents the change in fair value measurements for Level 3 investments held by the staff pension plan and the retiree health plan for the plans' year ended June 30, 2019, in thousands of dollars:

	Pension	Retiree Health
Beginning balance	$ 12,101	$ 1,008
Unrealized (loss)	(2,027)	(674)
Purchases	2,445	-
Sales	(1,190)	(178)
Ending balance	$ 11,329	$ 156

The investment objective for the pension and retiree health plans seeks a positive long-term total return after inflation to meet the university's current and future plan obligations. Asset allocations for both plans combine tested theory and informed market judgment to balance investment risks with the need for high returns. Plan asset allocations by category at June 30 are as follows:

	Pension		Retiree Health	
	2019	2018	2019	2018
Absolute return	24.4%	28.2%	24.0%	27.5%
Domestic equity	5.9%	7.9%	10.0%	7.6%
Fixed income	8.0%	7.8%	4.0%	3.9%
Foreign equity	22.6%	22.6%	24.6%	21.9%
Leveraged buyouts	8.6%	7.0%	8.4%	8.4%
Venture capital	14.2%	13.0%	12.5%	12.5%
Real estate	6.8%	6.4%	8.8%	10.4%
Natural resources	1.9%	6.0%	0.9%	5.5%
Cash	7.6%	1.1%	6.8%	2.3%

The pension and retiree health long-term rate of return assumption is determined by adding expected inflation to expected long-term real returns of various asset classes, considering expected volatility and correlation between the returns of various asset classes.

Contributions

Annual contributions for the pension and retiree health plans are determined by the university considering calculations prepared by the plans' actuary as well as other factors. Expected contributions on a cash basis to the pension plan and retiree health plan in fiscal 2020 are $76.7 million and $42.2 million, respectively.

Benefit Payments

The following estimated benefit payments, which reflect expected future service, are expected to be paid out of the plans, in thousands of dollars:

Fiscal year	Pension	Postretirement	Total
2020	$ 48,620	$ 33,094	$ 81,714
2021	52,563	37,286	89,849
2022	56,958	40,801	97,759
2023	61,590	45,491	107,081
2024	66,297	48,856	115,153
2025-2029	402,355	286,749	689,104
	$ 688,383	$ 492,277	$ 1,180,660

12. Net Assets

The university's net assets as of June 30, in thousands of dollars, includes:

	2019	2018
With Donor Restrictions:		
Donor-restricted endowments, perpetual in nature	$ 4,260,677	$ 3,981,513
Student loans, perpetual in nature	47,690	45,622
Donor-restricted endowments, subject to spending policy and appropriation	20,735,383	20,392,002
Board designated endowment, subject to spending policy and appropriation	310,263	255,412
Unexpended gift balances	995,381	1,055,642
Total net assets with donor restrictions	26,349,394	25,730,191
Without Donor Restrictions:		
Board designated endowment, subject to spending policy and appropriation	5,008,493	4,722,139
Undesignated	176,453	1,091,442
Non-controlling interest	707,411	713,343
Total net assets without donor restrictions	5,892,357	6,526,924
Total net assets	$ 32,241,751	$ 32,257,115

Yale's endowment consists of approximately 7,800 funds established for a variety of purposes.

The endowment includes both donor-restricted endowment funds and funds designated by the Corporation to function as endowments. The university endowment fund composition by fund type as of June 30, in thousands of dollars, includes:

2019	Without Donor Restrictions		With Donor Restrictions		Total
Donor-restricted endowment	$ -	$	24,996,060	$	24,996,060
Board-designated endowment	5,008,493		310,263		5,318,756
	$ 5,008,493	$	25,306,323	$	30,314,816

2018	Without Donor Restrictions		With Donor Restrictions		Total
Donor-restricted endowment	$ -	$	24,373,515	$	24,373,515
Board-designated endowment	4,722,139		255,412		4,977,551
	$ 4,722,139	$	24,628,927	$	29,351,066

Changes in endowment net assets for the fiscal year ended June 30, in thousands of dollars, were:

2019	Without Donor Restrictions		With Donor Restrictions		Total
Endowment net assets, beginning of year	$ 4,722,139	$	24,628,927	$	29,351,066
Investment return:					
Investment income	70,636		393,084		463,720
Net appreciation	185,534		980,738		1,166,272
Total investment return	256,170		1,373,822		1,629,992
Contributions	13,296		367,890		381,186
Allocation of endowment spending	(210,826)		(1,143,742)		(1,354,568)
Other increases	227,714		79,426		307,140
Endowment net assets, end of year	$ 5,008,493	$	25,306,323	$	30,314,816

2018	Without Donor Restrictions		With Donor Restrictions		Total
Endowment net assets, beginning of year	$ 4,104,806	$	23,071,235	$	27,176,041
Investment return:					
Investment income	53,608		334,046		387,654
Net appreciation	585,332		2,304,924		2,890,256
Total investment return	638,940		2,638,970		3,277,910
Contributions	7,588		130,452		138,040
Allocation of endowment spending	(163,542)		(1,118,282)		(1,281,824)
Other increases (decreases)	134,347		(93,448)		40,899
Endowment net assets, end of year	$ 4,722,139	$	24,628,927	$	29,351,066

13. Functional and Natural Classification of Expenses

The consolidated financial statements report certain categories of expenses that are attributable to one or more program or supporting functions of the university. Expenses reported by functional categories include allocations of costs for operation and maintenance of plant, interest on indebtedness and depreciation and amortization expense. The university applies various methods to allocate costs among the program and support functions, the most significant of which is by the amount of building space utilized.

Operating and non-operating expenses by functional and natural classification for the fiscal year ended June 30, in thousands of dollars, were:

2019	Programmatic support	Patient care and other related services	Administration and other institutional support	Total
Salaries and wages	$ 1,137,449	$ 522,476	$ 136,717	$ 1,796,642
Employee benefits	381,789	146,026	49,967	577,782
Depreciation, amortization and interest	323,722	12,641	23,069	359,432
Other operating expenditures	851,785	190,160	59,066	1,101,011
Total operating expenses	2,694,745	871,303	268,819	3,834,867
Non-operating expenses	34,069	2,460	1,285	37,814
	$ 2,728,814	$ 873,763	$ 270,104	$ 3,872,681

2018	Programmatic support	Patient care and other related services	Administration and other institutional support	Total
Salaries and wages	$ 1,081,891	$ 485,599	$ 129,165	$ 1,696,655
Employee benefits	378,260	143,305	47,810	569,375
Depreciation, amortization and interest	293,762	12,317	23,841	329,920
Other operating expenditures	793,946	178,885	57,678	1,030,509
Total operating expenses	2,547,859	820,106	258,494	3,626,459
Non-operating expenses	39,573	1,338	1,123	42,034
	$ 2,587,432	$ 821,444	$ 259,617	$ 3,668,493

14. Commitments and Contingencies

The university is involved in various legal actions arising in the normal course of activities and is also subject to periodic audits and inquiries by various regulatory agencies. Although the ultimate outcome is not determinable at this time, management, after taking into consideration advice of legal counsel, believes that the resolution of these pending matters should not have a material adverse effect upon the university's financial position.

Minimum lease commitments at June 30, 2019, under agreements to lease space, in thousands of dollars, are as follows:

	Operating Lease Payments	Capital Lease Payments
2020	$ 13,529	$ 16,915
2021	11,071	16,922
2022	9,033	16,914
2023	7,366	16,921
2024	7,141	17,066
Thereafter	36,588	278,132
	84,728	362,870
Executory costs	-	(99,393)
Interest on capital leases	-	(93,895)
	$ 84,728	$ 169,582

The university has outstanding commitments on contracts to construct campus facilities in the amount of $392.5 million at June 30, 2019. Funding for these projects is expected to come from capital replacement reserves, gifts, and debt.

15. Subsequent Events

Management has evaluated subsequent events for the period after June 30, 2019, through October 22, 2019, the date the consolidated financial statements were issued.

The President and Fellows of Yale University

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Fellows
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Her Honor the Lieutenant Governor of Connecticut, *ex officio*

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Hong Kong, China

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Yale Jackson Institute for Global Affairs

55 Hillhouse Avenue, home of the current Jackson Institute for Global Affairs at Yale, photographed by Michael Marsland.

In the spring of 2019, the Yale Board of Trustees approved the transformation of the Jackson Institute for Global Affairs into a school. The school, set to open in the fall of 2022, will be the first professional school established at the university since the opening of the Yale School of Management in 1976. Its objectives will be to provide students with knowledge across a number of disciplines that will enable them to face global challenges and pursue related opportunities.

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