Office of the Chief Investment Officer of the Regents

Opportunity

UNIVERSITY OF CALIFORNIA

Statement from Jagdeep Singh Bachher

Chief Investment Officer and Vice President of Investments

When I joined UC three years ago, I came in ready to listen and learn. I believed that before I could begin to create the strategies that would secure our future, I first had to understand the UC Investments Team, the Office of the President and indeed the entire University system. It was only after months of discussions and meetings with students, faculty, our investment partners, my team and many, many others that I began to see areas where we might improve, innovate and reset our foundations for long-term success.

What was clear to me in this process was that while the traditional model of endowment management was a good one, we are not a traditional university. We are an exceptional university. Quite literally, we have no rival on this planet (or, as our astrophysicists tell me, any other planet) in terms of research dollars deployed, awards given, patents filed and so on. In addition, our size and scale as an investment office presented both opportunities and constraints that were rather different from some of our "peers." Moreover, the investment world in which we have been living for decades was about to be turned upside down, as many felt (and feel) we're entering a prolonged low-growth environment.

So we needed to change. We needed to chart our own course. And to do that, we needed to truly understand ourselves and where we could compete in the global market for investments.

In the past three years, I've worked with people from every nook and cranny of the university. I've called upon our alumni to serve this university once more. I've sought to utilize the global reputation of our ten campuses, five hospitals and three national laboratories to develop a unique and thoughtful approach to investing. I've been building our own way of investing, what we have been calling the "UC Investments Way."

We've realized that we're not just investment managers focused on racking up assets in hopes of a good return. No, we are, first and foremost, risk managers who assess each decision based on how much risk we can tolerate. This year, we finished our new asset and risk allocation plan — three years in the making — and it is serving us well.

Another major shift we made was in our culture. We went from being siloed by asset classes to being focused on what will best serve our products and clients, from students to faculty, from chancellors to CFOs. That's because we realize there are no holidays when it comes to delivering on the needs of our customers. Every UC stakeholder has distinct and urgent needs: a paycheck, a new piece of equipment, to see their nest egg grow. We're here to serve them. We've also worked to further entrench a culture of transparency. We go beyond just reporting results that get produced out by our systems. We take the time to do a deep dive to assess, compare and distill so that we provide results with the type of valuable context that helps us make better decisions.

For all the progress we've made in creating our own way, the thing I'm actually happiest to report this year is that we are now thought of as a true partner that's integral to the success of UC. After years of operating as an isolated office, we've not only broken down silos internally, we've helped create a symbiotic and truly transformational relationship between our office and those we serve.

As I said at the beginning, I didn't have a plan to do this when I got here; there was no slide deck that predicted the Return on Investment (ROI) of this collaborative approach. It's been a grassroots process, one conversation at a time. One meeting at a time. One faculty member. One student. One Regent at a time. We've done a lot of listening. And we've made our default response to any challenge "Let's work together. We can figure this out."

We're here to collaborate. We're here to learn. We're here to serve. And we're humbled to have this responsibility.

Statement from Janet Napolitano

President,
University of California

In a University as big and bold as ours, a culture of collaboration and innovation is a key to our success.

Over the past fiscal year, the UC Investments office has been an integral partner as we have moved forward together on some of our most important and exciting initiatives.

California has long led the nation on sustainability, climate policy and clean energy, and the University of California has taken groundbreaking steps to achieve carbon neutrality and other sustainability goals consistent with the state's actions and the Paris agreement. At the same time, through our Framework for Sustainable Investing, we have worked to ensure that the investing decisions we make both reflect UC values and earn a competitive return.

Another area of collaboration I am particularly proud to see growth in this year is our UC Ventures program. In just its second full fiscal year of operation, UC Ventures has generated high-quality investments with top-tier co-investors, capitalizing on UC's "homegrown" talent, then investing that value back into UC innovators.

The UC Investments team continues to serve as a valuable resource and partner as we pursue the best investment strategies for UC stakeholders. We have worked together this year to secure the long-term stability of the UC Retirement Plan (UCRP) for our faculty and staff. UC Investments has made significant progress in other areas as well, revitalizing our captive insurance program, optimizing our Working Capital and General Endowment assets to increase spending for research and initiatives across the UC system.

Together, we will continue to work to not only strengthen the core research and public service efforts, but also to guarantee that the next generation of Californians has the same exceptional higher education opportunities as past generations.

Our collaboration is an investment in the future that will enable us to preserve UC values, support innovation, increase sustainability and grow our assets while expanding opportunity for all Californians.

"In a University as big and bold as ours, a culture of collaboration and innovation is a key to our success."

Q&A with Richard Sherman

UC Board of Regents
Chair of the Investments Subcommittee

You are in your second year as Chair of the Investments Subcommittee. What is one area you feel UC Investments made the most progress on this past year?
The work we've done this year to advance UC's commitment to the fight against climate change is definitely a high point for me. We have committed to carbon neutrality by 2025 for our ten campuses, five medical centers and three national labs, and we've signed agreements to buy 80 megawatts of solar power, the largest amount owned by any U.S. university. The U.S. Environmental Protection Agency has also named us among the nation's distinguished leaders in the use of clean, renewable energy.

To date, we are the only institutional investor that is a signatory to Bill Gates' Breakthrough Energy Coalition, and earlier this year, we contributed $50 million to Congruent Ventures, a new energy seed-stage venture capital fund. We are also allocating $100 million to a fund that will target high-performing, mission-based companies that deploy clean energy, health, water and sustainable agriculture solutions.

And though our holdings of securities of oil and gas drilling and refining firms now represent only about 3 percent of UC's total public equity holdings — below the real-world average of 6 to 7 percent share of the global economy — we continue to look critically at all our fossil fuel investments on a regular basis under our sustainable investment lens, and we are working to position our portfolio to acknowledge the transition to low carbon energy. This is imperative.

Last year's numbers were down. This year's were up. How does UC Investments approach such an unpredictable environment?
I'll start by saying that it's important to note that part of the reason we had a great year this year can be directly attributed to the implementation of our asset allocation by Jagdeep and his team. But in general, we're approaching this as a continued low-growth, low-return environment, and we have to temper our expectations accordingly. Because even though the equity market has done well, wage growth is still pretty low, inflation is growing at a small rate, and the federal reserve is unwinding its $4 trillion balance sheet. All of this means we're in uncharted territory and so in a place of extreme caution. We have to stay highly attuned to where our assets are deployed on a broad level and moderate our return expectations for our products.

The UC Ventures program is still in its infancy, but it had quite an active year.
Yes, it's exciting to see UC Ventures really start to gain momentum. Given the significant number of inventions and patents created daily in our system, we are looking to capitalize on these opportunities as part of our overall private equity strategy. We're looking to "eat our own cooking." It's going to take some time to deploy that money and it's a long harvest period — so we have to be patient, but we're long-term investors; we can do it.

What do you think of the work UC Investments has done to further evolve its culture and strategy over the past year?
One thing I've been very happy to see in my first full year as chair is the right-sizing of UC Investments, both internally and externally. They've continued to reduce the number of external managers and are now working with only the best of the best. And because we now have more dollars with fewer people, we've been able to negotiate better, performance-oriented fee structures. In fact, our overall cost of managing $100 billion continues to shrink, and for the office, it costs us only 3 basis points for our investments and operations.

In terms of strategy, we transitioned a significant part of the public equity portfolio to passive management (index products), which have historically been proven as a better way to go. We're also well on the road to outsourcing our defined contribution plan target date investment options. Overall, this plan is in excess of $20 billion, so this will make a big difference and will be much more efficient both for UC and for our participants.

Finally, I'm very impressed with the overall culture of collaboration, transparency and excellence in the office. All the staff are working really hard with a shared focus. Egos are checked at the door and everyone talks to each other, not just to those who work in their own specific area. It's an all-for-one and one-for-all approach that makes the office stronger.

Ideas into action.

The world around us continues to change, sometimes in dramatic fashion. Massive technological revolutions in the investment industry and beyond. A shift in the balance of power away from short-term investors toward large, long-term investment organizations like ours. Unknowable global financial risks.

To keep up with the external forces that threaten to disrupt our plans and even beliefs about the world, we've had to forge a new path. And we're rewriting some of the rules of our organization along the way to take advantage of these shifts and prepare for the world ahead, while still delivering on the core promises that we've made.

This is why we've been so preoccupied with innovation and efficiency.

These are the actions that the great organizations — the ones that last — do and do exceedingly well. But great organizations are a rarity, since the natural state is to be either innovative or efficient. It's kind of like oil and vinegar: one does not naturally go with the other without a concerted effort at combining the two, often through vigorous shaking. But the results can be delightful.

So in pursuit of this duality, we've had to be proactive about shaking up our own organization. It's not always pleasant, but we hope the outcomes will be delightful and rewarding for our organization and the university we serve.

How we've been shaking things up over the last three years:

- We empowered people and built a culture of accountability and creativity.
- We expended internal resources to build stronger relationships with our sponsors and stakeholders, which has given us more leeway to try innovative things.
- We built a quasi research and development team that's been running for three years.
- By doing fewer, simpler things, we've been able to combine innovation and efficiency in the organization (if not in the same strategy or approach to the market).
- We re-negotiated our fees and costs we pay to our partners, as we view them as key elements in ensuring an alignment of interests and long-term performance.
- We changed our focus. We are product-centric and risk savvy. We are collaborative, innovative and solution-oriented.

And here are some of the positive shifts we've seen:

In the last three years, we've explored dozens of ways to shift how we invest in assets and have actually launched five new platforms: UC Ventures, Aligned Intermediary, Congruent, UC RNT Associates (with Ratan Tata in India) and Risk 3.0. Each of these new programs seeks to capitalize on our comparative advantages in the marketplace, while exploring new ways of accessing assets.

All of it is innovative. None of it was easy. It's an exploration, an adventure.

We expect a sort of "J-curve" from these innovative projects, an incubation period before the programs are at a point where they are ready to add value. We believe we're now coming out of the low part of the curve, and looking to the future, we're convinced we have the pieces in place to perform well.

In this year's annual report, we offer a deeper look into our shift to an innovative and efficient organizational culture.

Meaningful relationships. Long-term results.

As institutional investors, we live and breathe ROI, the holy grail of metrics. It's what we're used to; it's what's expected. But as we continue to keep a laser focus on making the right decisions for the people of UC, we believe it's important to think about an additional factor: our relationships and the role they play in delivering ROI.

The strong relationships we have with people across the UC system — whether they're in the cubicle next to us or on a 16-hour flight across the globe — play a key role in our bottom-line ROI. When we work to cultivate and nurture these relationships, we set ourselves up to reap the benefits. Yes, it may take longer to pay off, but as long-term investors, we have the time.

Here's how we're working to boost the ROI of our relationships at UC Investments.

We concentrate on our clients.
Over the past three years, we've met with all our stakeholders — holding more than 100 meetings — and they have direct access to us.

We're a trusted resource for UC.
We continuously look for new ways to partner and be of service to the greater University, including the Office of the President, campus CFOs and campus foundations, and we're here to generate solutions that others can't.

We operate from the same playbook.
Everyone in our office works together as a united team, no matter which product they're responsible for. We share ideas freely and make every decision based on a shared set of investment beliefs.

We always find a way.
Fiat Lux, UC's captive insurance program, wanted to expand their operations, but was having trouble finding a way to make it happen. When they came to us, we jumped on the opportunity to help. We partnered with our insurance team and their board to breathe new life into the program to better manage enterprise risk across the university — and save millions in the process.

We're a thought leader in the industry.
By strengthening our presence in the industry, we've been able to develop powerful strategic partnerships with market and industry leaders, which solidify our reputation as an innovative organization focused on solutions.

We invest in ourselves.
Through the UC Investments Way we developed, we're partnering with UC professors, researchers, students and alumni to invest in promising startups that emerge from our system.

We invest for our planet.
We're working actively with our external managers and the president's office to pursue investment opportunities that take our environmental, social responsibility and corporate governance (ESG) framework into consideration.

We invest in the future.
To foster the next generation of investors, we started the Investment Fellows program in our office to offer both experienced investors and passionate novices the chance to grow and become a part of the future of UC Investments.

As the investment world evolves to embrace new technologies like artificial intelligence, we understand that what we know may become less valuable — at least on a relative basis — than who we know.

By continuing to invest heavily in our relationships, we will ensure our best chance to see a strong ROI, one that will benefit all of UC.

UC Investments way.

The best investments tend to be found in areas where markets are inefficient and where information does not freely travel. If an opportunity fits in a box or a silo, it's likely overpriced and unattractive. So the best investors use their unique characteristics in a deliberate attempt to move into markets with minimal competition. That's what the "UC Investments Way" is ultimately about: understanding ourselves and our comparative advantages over the marketplace to cultivate and capitalize on persistent, high-quality investment opportunities.

What Makes UC Unique

The UC Ecosystem
We have one of the most robust innovation ecosystems on the planet, with 10 campuses, five hospitals and three national laboratories. Accordingly, we've built a mechanism to thoughtfully invest within that ecosystem. We call this program UC Ventures.

Long Term, Deep Pockets
We have a unique advantage over the market in large, long-term infrastructure assets. This is why we helped to launch the Aligned Intermediary, which is a collaborative peer platform that supports investors in making long-term investments in climate infrastructure, such as wind and solar projects.

Strong Relationships
The University of California attracts remarkable people from all over the world into its orbit. We proactively work to convert some of these connections into deep relationships. For example, we have been privileged to work with Ratan Tata, formerly chairman of the Tata Group, over the past two years. In fact, this relationship has now been formalized in an investment partnership with RNT Associates, Mr. Tata's personal investment vehicle.

Tech Enablement
We manage multiple investment and finance businesses from our perch in Silicon Valley, giving us unique access and the ability to support fintech and invest tech companies. We proactively work with innovative tech startups and see this as a source of advantage in our investing.

By focusing on where we're different, we hope to deliver consistent and reliable investment returns at lower cost and with lower investment risk.

Delivering value through values.

Investing for the next 100 years takes patience and persistence. So we developed 10 core investment beliefs to keep us grounded as we evolve and respond to dynamic market conditions. These act as a compass, guiding everything we do so that we secure the best results for the university and its many stakeholders.

1

Invest for the long term.

Where we can, we focus on investments over 10 years and beyond. This offers many more opportunities than those available to short- and intermediate-term investors. We aim to make the most of our scale and ability to be patient.

2

Invest in people.

The contributions of talented people are among the most important drivers of success for any investment organization. So we've made the recruitment and retention of exceptional staff a cornerstone of our strategy.

3

Build a high-performance culture.

Every organization needs a clearly-defined culture to make sure everyone is working toward the same ends and speaking the same language. Our culture is one of responsibility, accountability and high performance. We are proud of our achievements but try to be humble, as markets sometimes surge and fall without warning.

4

We are all risk managers.

Our aim is simple: to earn the best risk-adjusted return that meets the objectives of our various portfolios. But achieving that aim is complex. An effective risk-management function is critical, enabling the leadership to delegate authority to the investment team. Everyone on the team is in the risk-management business.

5

Allocate wisely.

The key to investing, and the most important driver of performance, is asset allocation. To make effective investment decisions and achieve the appropriate combination of risk and return, we have to maintain a clear and balanced understanding of stakeholders' unique objectives, time horizons, risk tolerances, liquidity and other constraints. As a globally significant investor, we also aim to make the most of our scale and patience when we allocate assets.

6

Costs matter.

High-quality advice comes at a cost. We get that. But we also believe fees and costs for external managers must be fully transparent and straightforward. Anything else creates potential problems — opaque fees can mask risk. Plus, cost savings can be considered a risk-free return. If we can save money through efficient, well-executed strategies, then we must. We intend to aggressively capture every dollar of this risk-free return that we can.

7

Diversify with care. Act with clarity.
Diversification is invaluable, but it's not a cure-all. It allows us to spread risk and reduce the impact of any individual loss. But diversifying too broadly has the effect of producing returns that are index-like and can draw investors into assets and products they don't fully understand. We also need to be keenly aware of our own strengths and weaknesses in the global context in order to act decisively when we believe markets are behaving irrationally or when we have a skill or knowledge advantage. That means keeping a constant, clear-eyed check on our evolving capabilities. It's not always an easy or painless process, but it's an essential one.

8

Sustainability impacts investing.
Sustainability is not a "check box," but rather a fundamental concern that we incorporate into decision making. We focus particularly on how sustainability can improve investment performance. Sustainable businesses are often more rooted in communities and resilient to future crises, which means investing in them makes good business sense. They are bound to affect portfolios in the future, and we need to consider them in our broader lens of investment decision making.

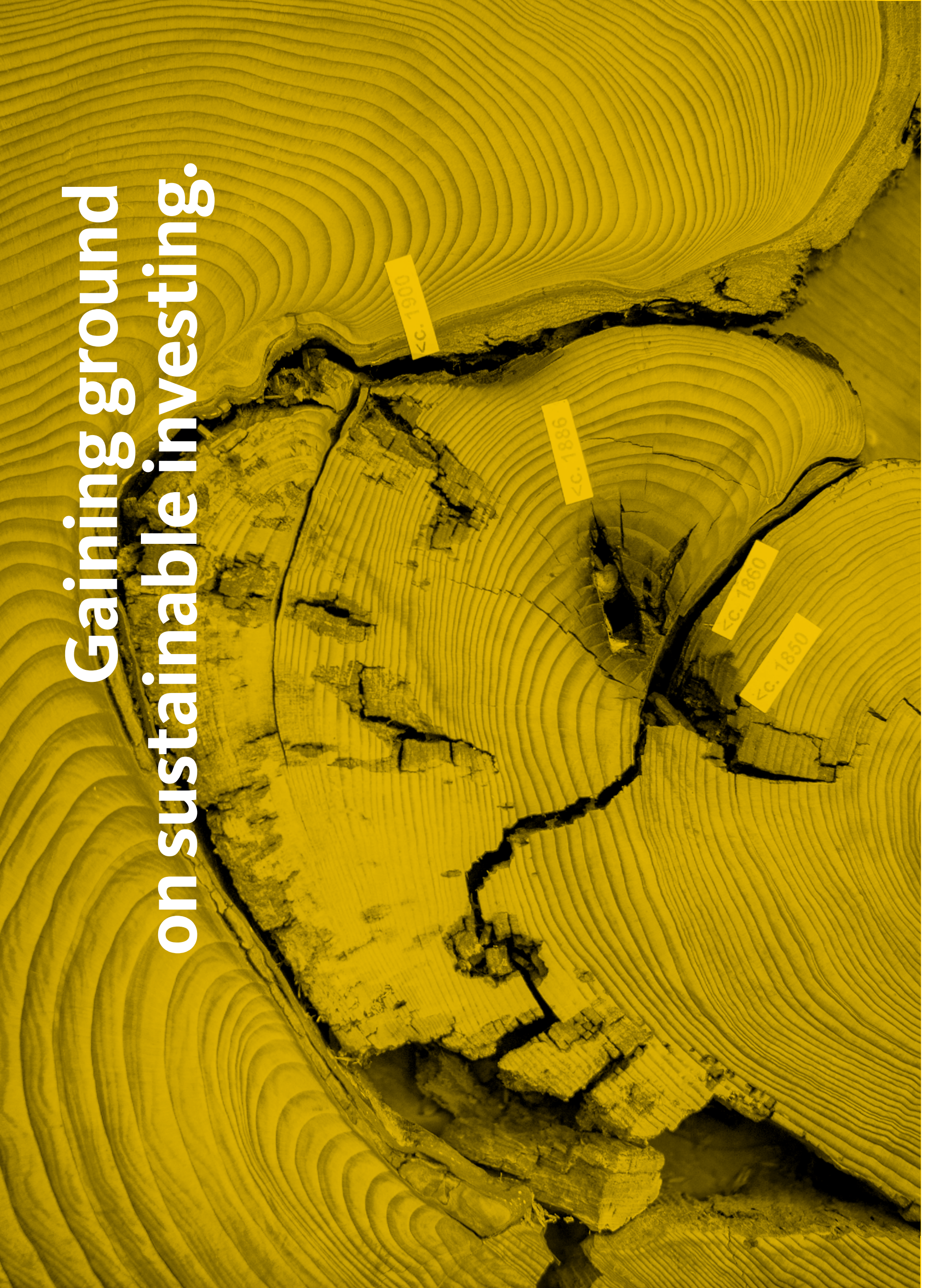
9

Collaborate widely.
We are proud to be a part of the University of California, as well as the broader community of institutional investors. Through active collaboration, we aim to leverage the unique resources of the university. We also want to foster collaborative relationships with our peers to leverage our long-term competitive advantages.

10

Innovation counts.
The best investors recognize that markets are constantly fluctuating and that no good idea lasts forever. We must always be innovating and identifying new opportunities. Getting in early brings rewards. Just as importantly, some of the best opportunities transcend asset-class silos. There are advantages in thinking differently and partnering with peers that are willing to work with us on innovative projects. Collaboration is one of the most powerful drivers of innovation.

Gaining ground on sustainable investing.



At UC, sustainable investing is at the core of our investment philosophy. Today, it's part of everything we do, which — we admit — required a cultural shift to reorient our thinking around long-term performance and value creation.

In our view, true sustainable investing cannot be achieved by simply voting a proxy, adding a director of sustainability or even divesting from an asset class. Because traditional models of finance and investing often fail to appropriately integrate sustainability issues, we've had to build it into our thinking from the ground up. It requires integration across our products, across our product teams and across our entire organization.

While our students, faculty and staff tend to think about sustainability purely from a values perspective, we approach it both from a risk-management perspective and from an opportunity perspective. We are convinced sustainability can help us increase our risk-adjusted returns over the long term by helping us manage long horizon risks. Over the past two years, we've worked to further implement the framework for sustainable investing we created in 2015, taking bold steps to fully integrate the consideration of ESG factors systematically and holistically into our investment evaluation and risk-assessment processes.

Over the past 12 months we've actively engaged with all our external managers, new and old, to convey sustainability concerns and to stay in alignment. We've also improved our automated system for creating and conveying ESG restriction lists to our external managers. In addition, we are actively pursuing investment opportunities in and around the themes that we have identified in our framework for sustainable investment — themes we see as being important macro trends and drivers in the global economy.

Climate Change

We increased our focus on climate change this year. Our ultimate goal is to position our portfolio to be more resilient to this risk and consistent with the energy transition expected in the coming decades, while still accessing today's opportunities to generate returns. We have instituted a targeted climate change risk modeling framework for use in our private equity, real assets and alternative investment opportunity assessments. We are also paying careful attention to the risks associated with investing in fossil fuels, as well as reassessing energy holdings in our portfolio to consider changes in overall economic conditions, shifting commodity markets, climate change risk and other emerging ESG risk factors.

Key Investments & Liquidations

- First and largest founder of the Aligned Intermediary, which helps long-term investors identify investable climate infrastructure projects in clean energy, water infrastructure and waste-to-value.
- The only institutional investor that is a signatory to the Bill Gates Breakthrough Energy Coalition to accelerate clean energy solutions.
- Partnering with family offices and sourcing ideas from our national labs and agricultural centers.
- $50 million to Congruent Ventures, a new energy seed-stage venture capital fund.
- $100 million commitment to the TPG Rise Impact Fund, seeking to achieve social and environmental impact alongside competitive financial returns.
- Liquidation of holdings in high-yield bonds of Dakota Access Pipeline (DAPL) operating companies ETP and SUNOCO.
- Sold holdings in the world's largest coal mining firms and firms that generate profits from Canadian oil sands mining.

Social Responsibility

We continue to look for ways to magnify our collective voice on important social and governance issues. Our goal has been to enhance long-term returns by engaging companies to improve performance on governance and other ESG factors as part of their management focus and priorities. To this end, we served on a task force to draft and promote a U.S. Framework for U.S. Stewardship and Governance Code that was released to the public in early 2017. We also signed on to be part of the institutional investor committee of the 30 Percent Coalition, a unique and groundbreaking national organization committed to the goal of women holding 30% of board seats across public companies. And finally, we participated in an active dialogue between the UC administration and the Afrikan Black Coalition on issues of joint concern and supported efforts to engage Wells Fargo Bank regarding its responsible banking policies and practices.

Thought Leadership & Outreach

We are proud to be one of 1,400 signatories to the United Nations-supported Principles for Responsible Investment (UN PRI), an investor initiative that promotes the alignment of investment activities with long-term societal interests through integration of ESG factors. As part of our obligations as a UN PRI signatory, we've participated in the Ceres Investor Network on Climate Risk, and senior staff have served on UN PRI working groups with peer institutions to identify best responsible investing practices, as well as on the UN PRI's fixed income and private equity advisory committees. We've also collaborated with the UN PRI on the Global Investor Statement on Climate Change in the lead up to the COP21 climate negotiations in Paris.

UC Investments has been a champion of sustainable investing in important global forums including the Milken Institute Global Conference, Institutional Investor Magazine's Endowments and Foundations Roundtable and the Conference on Inclusive Capitalism.

UC Sustainable Investment Framework

1. Climate change
2. Food and water security
3. Inequality
4. Aging population
5. Diversity
6. Human rights
7. Circular economy
8. Ethics and governance

The ultimate investment: UC.

With top-ranked institutions, 61 Nobel Prize Winners and the best and brightest students, UC is the biggest entrepreneurial ecosystem in the world:

- UC produces more patents than any other U.S. university, averaging about five new inventions every day.
- More than seven new UC startups are formed every month.
- UC startups have contributed more than $20 billion to the California economy and employ close to 20,000 Californians.

It became clear to us several years ago that supporting UC's own inventors, builders and makers — the best in the world — was both the right thing to do and had the potential to provide tremendous long-term value to the university. So in 2015, we partnered with renowned Silicon Valley entrepreneur Vivek Ranadivé and Bow Capital as part of the UC Ventures program to discover, provide capital for, and then capture value from the ideas and research coming out of our own system.

This hands-on supplement to the standard education and research regimen speeds the transfer of innovative UC ideas to high-impact technology development and commercialization. It's also UC's public service mission to meet society's needs while supporting its ongoing research and education goals.

This year, Bow Capital worked to capitalize on their expertise and relationships with UC, other funds, incubators, entertainment and media, industry leaders and accomplished entrepreneurs to help companies we partner with to make the world a better place. The deal flow has led to high-quality investments made with top-tier co-investors. We also continued to build relationships with our own campuses to discover new talent by seeding local angel investment funds, hosting demo days, keynotes and entrepreneurship guest lectures.

And this is just the beginning.

On June 30, 2017, our assets under management totaled $109.8 billion, an increase of $12.2 billion across all our products from the prior fiscal year, as a result of gains and a net inflow of about $200 million. Over the past three years, we added $12.3 billion, $10.1 billion from the markets and $2.2 billion from active implementation that is being used to meet the objectives of the UC products and stakeholders.

These assets are contained within the following investment products: Endowment, Pension, Retirement Savings, Working Capital (Total Return Investment Pool and Short Term Investment Pool), and Captive Insurance.

Our Products
Overview

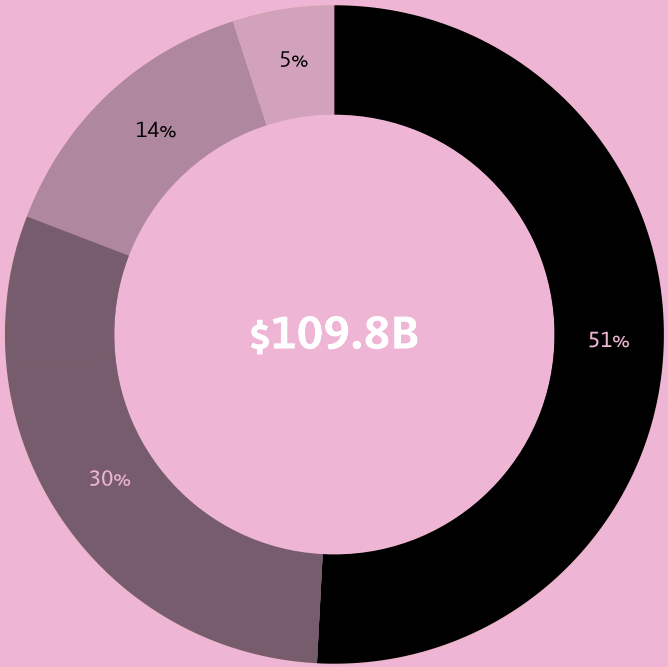
Market Value in Billions ($)

	June 30, 2017	1 year ago	5 years ago	10 years ago	20 years ago
Endowment	10.8	9.1	6.5	6.7	3.3
Pension	61.6	54.1	41.4	48.0	29.7
Retirement Savings	22.3	20.2	17.1	10.6	4.4
Working Capital Total Return	8.9	8.9	4.3	–	–
Working Capital Short Term	5.3	5.3	7.0	7.7	4.0
Captive Insurance	0.9	–	–	–	–
Total	$109.8B	$97.6B	$76.3B	$73.0B	$41.4B

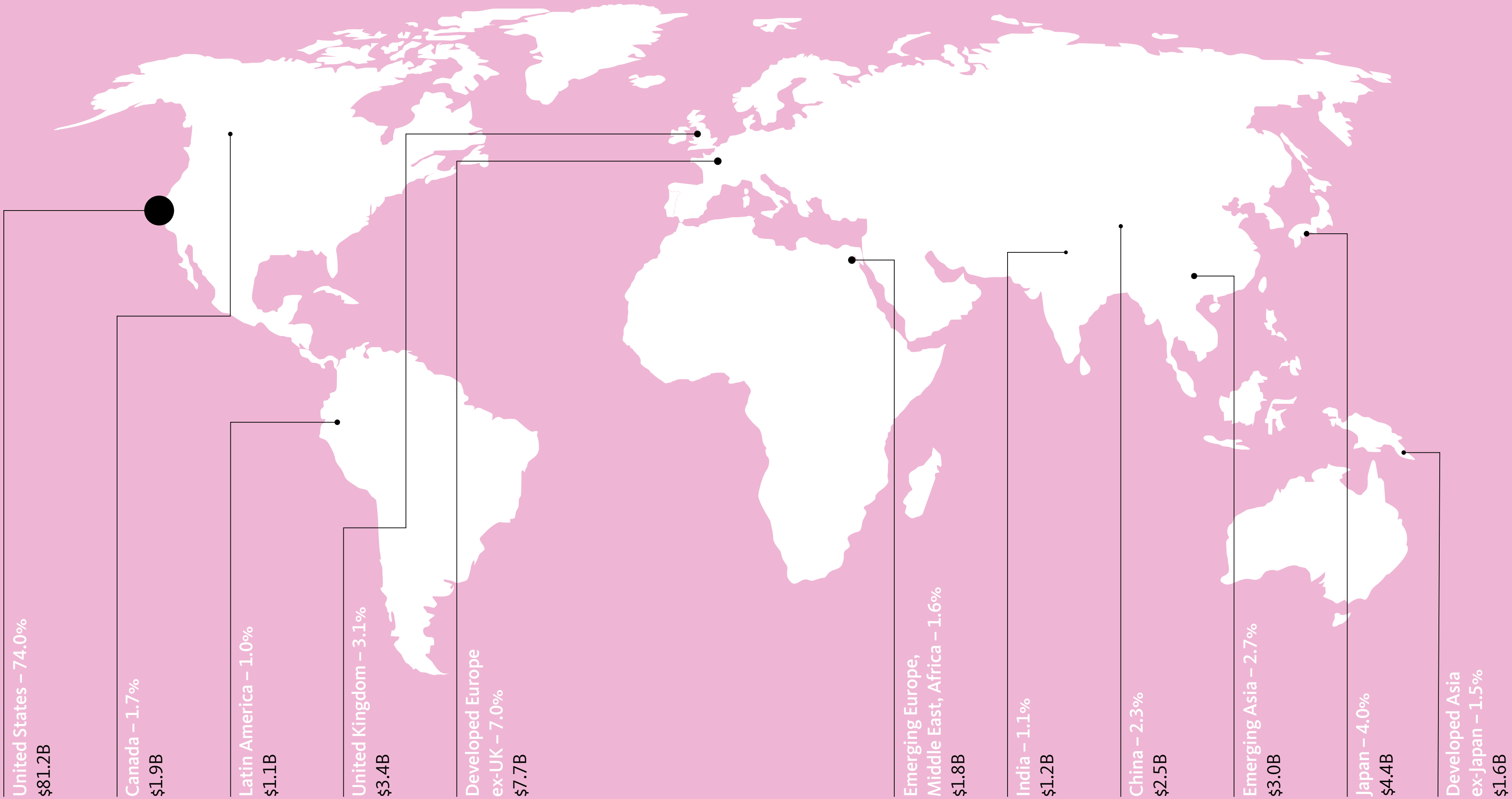
Our Products
How We Invest

Market Value in Billions ($)

Public Equity	$56.1B
Fixed Income	$32.6B
Other Investments	$15.5B
Absolute Return	$6.3B
Private Equity	$4.1B
Real Estate	$4.0B
Real Assets	$1.1B
Cash	$5.6B
Total	$109.8B



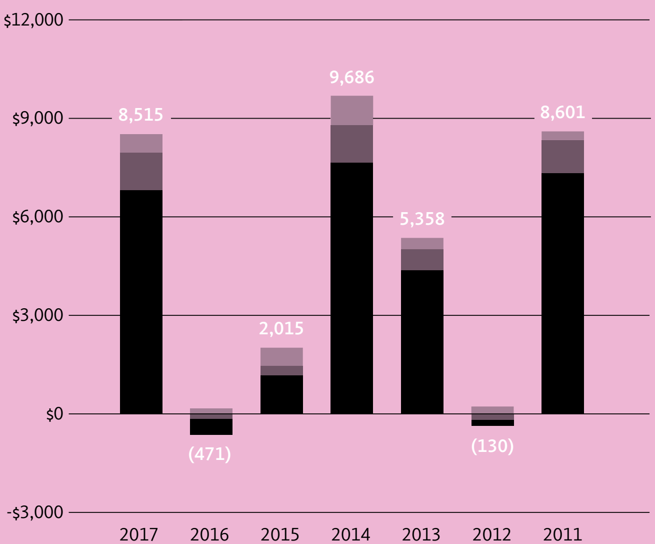
Our Products
Where We Invest



Our Products
What the Markets Gave Us

- Pension
- Endowment
- Working Capital

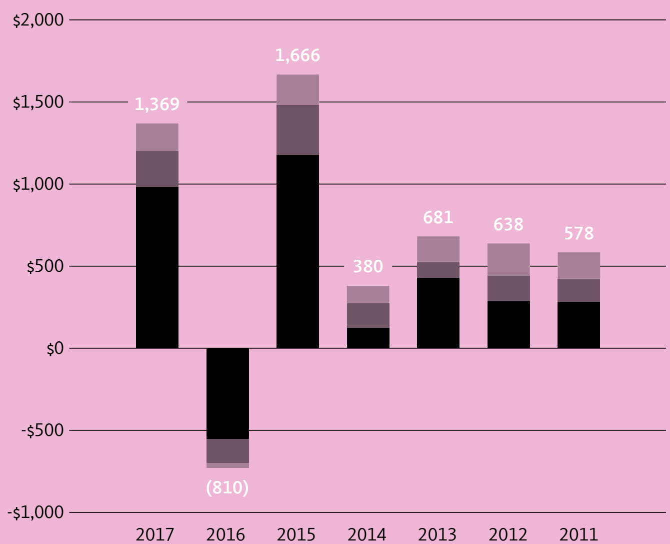
Value in Millions ($)



Our Products
Value Added Above the Markets

- Pension
- Endowment
- Working Capital

Value in Millions ($)



What happened in the equity markets this year

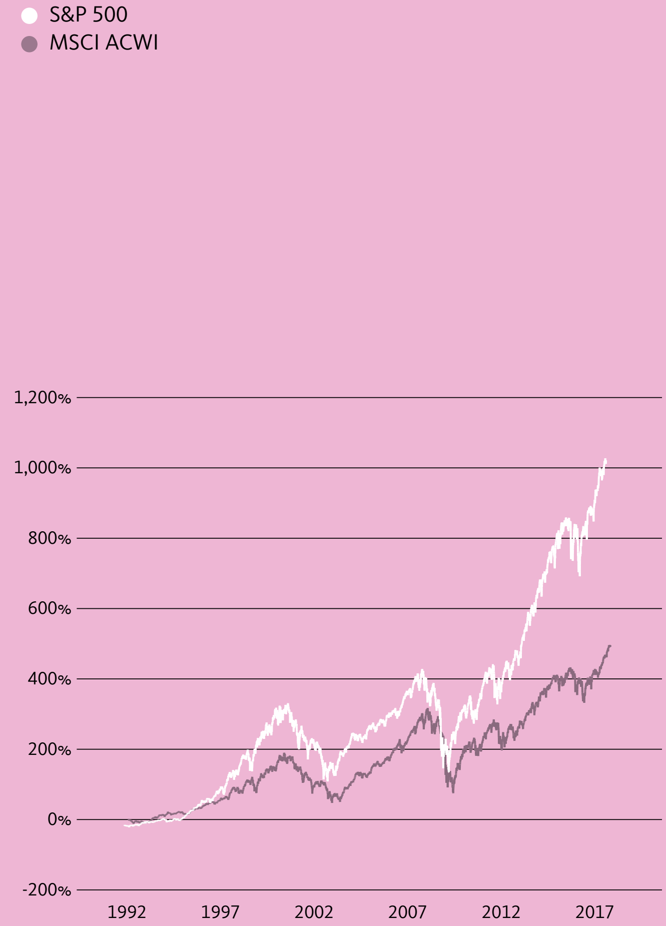
Equity markets posted double digits globally, reversing the declines from last year. We saw the equity volatility index (VIX) dip to lows seen before the global financial crisis, which has raised questions on whether the equity market has become too complacent.

With improvements in the global economy and expectations boosted for corporate earnings growth, global equity markets surged higher, up 19.6% (measured by the MSCI All Country World Index Investable Market Index) with all major regions posting double-digit returns. Continental Europe (24.4%) was the top performer, given the rise in the euro, improving economic conditions and earnings outlook.

Emerging markets (23.7%) rebounded from the weak returns in prior years driven by the decline in the dollar and improved growth. Regionally, emerging Asia (27.9%) led the gains given stabilization in China (32.2%), the star performer for the year, a reversal from last year. Japan (19.2%) followed closely behind despite a difficult year for the yen, and the U.S. was up 17.9% as measured by the S&P 500.

Across sectors, pro-cyclical stocks were up a lot: financials (35.0%), information technology (33.3%) and materials (23.9%) led due to the growth in earnings and the lack of any risks bubbling to the surface.

Equities



What happened in the bond markets this year

Global bond markets saw returns diminish during the year, given Fed tightening, the back-up in yields and sell-off after the election. When rates (yields) rise, prices of bonds go down, which results in losses. We started the fiscal year with U.S. 10-year treasury yield at 1.5% and ended the year at 2.3%, which led to losses of 5% for the 10-year treasury. Demand for yield and credit assets remained strong, and the markets delivered solid results. U.S. high-yield bonds (12.8%) gained given the rebound in the commodity sector. Emerging market debt (6.0%) bounced back from a difficult environment following the U.S. election, trade policy concerns and a weaker dollar.

Bonds

The UC endowment.

The Endowment is the bedrock of our university, providing critical financial support to the programs and initiatives that make our system the best in the world.

Established in 1933 with $100 million when UC had fewer than 3,000 students, today the Endowment has grown to a collection of more than 5,400 different funds, serving almost 265,000 students, with a total value of $10.8 billion. In fact, spread across our university campuses, the overall endowment and foundation assets are more than $17 billion. With our assets combined we rank among the top 10 largest university endowments in the U.S.

Our Endowment investment model is — and should be — unique, and so we've worked to resize and reposition our portfolio. We've also reduced our management costs by negotiating our terms and conditions with trusted relationships and by cutting our number of external managers by half. We now have a more concentrated list of managers deeply focused on delivering long-term results.

Over the last 20 years the Endowment has grown from $3.3 billion to $10.8 billion. This year marks the 20th anniversary of our spending policy, and we have paid out $3.9 billion during this time. In the past three years, we have seen $1.8 billion in new inflows and expect another $300 million in the coming year to total $2.15 billion. We are humbled by the confidence entrusted by our campuses and foundations in managing assets on their behalf.

A significant part of the inflows over the years (more than $650 million) came from working with all the campuses to optimize their capital and develop Funds Functioning as Endowments (FFE) to support new discoveries and developments, as well as student scholarships and fellowships. In 2015, the UC Santa Barbara Foundation showed a vote of confidence by selecting our team and the Endowment to invest their assets. Another notable partnership and inflow over the past year was the proceeds generated by the sale of royalties from a UCLA-developed drug, Xtandi.

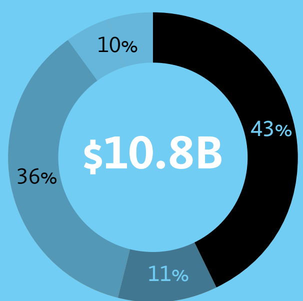
Given the low cash-flow demands on the Endowment, we're able to take on more risk — illiquidity risk in particular — than with our other products. So this year we've started a slow shift to reduce public equities and increase our exposure to private markets. This will be driven by the opportunity set afforded over time, and we believe that an opportunistic approach will help us achieve the best risk-adjusted returns for our capital.

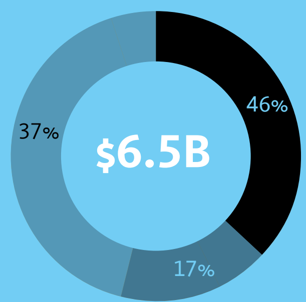
Endowment
Asset Allocation

- Public Equity
- Fixed Income
- Other Investments
- Cash

Market Value in Billions ($)

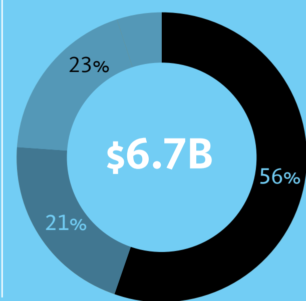
June 30, 2017

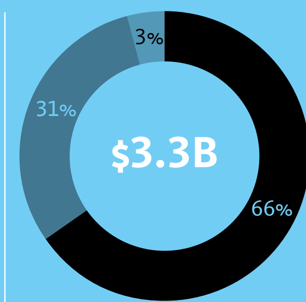




5 Years Ago

10 Years Ago





20 Years Ago

Endowment
Investment Highlights

16.9%
Gross Return

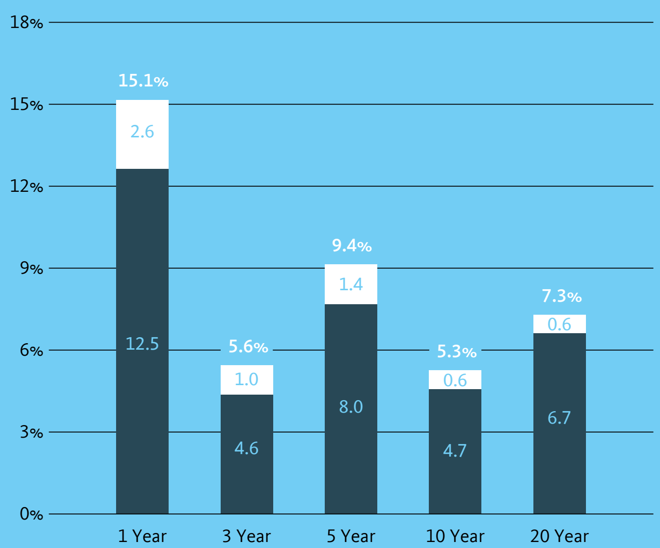
15.1%
Net Return

Market Value in Billions ($)

June 30, 2016	$9.1B
Market Gains	$1.2B
Value Added	$0.2B
Net Cash Flow	$0.3B
June 30, 2017	$10.8B

Endowment
Annualized Net Return

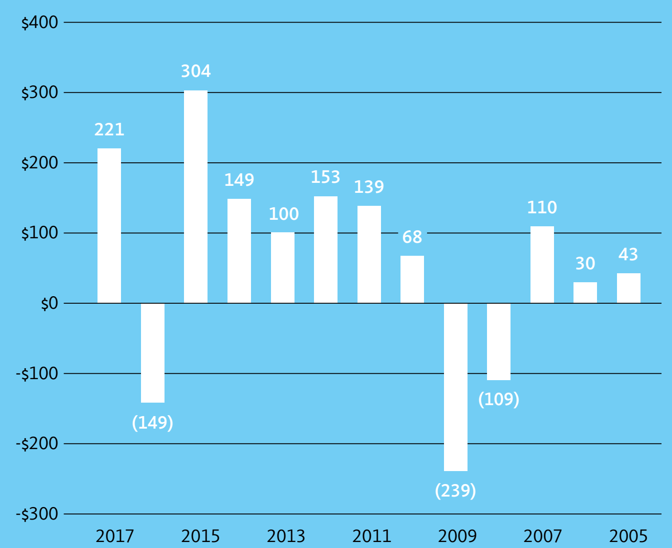
- Value Added
- Benchmark



Endowment
Dollar Value Added

- Dollar value added is what we earned beyond what we would have earned if we were passively invested in the market.

Value in Millions ($)



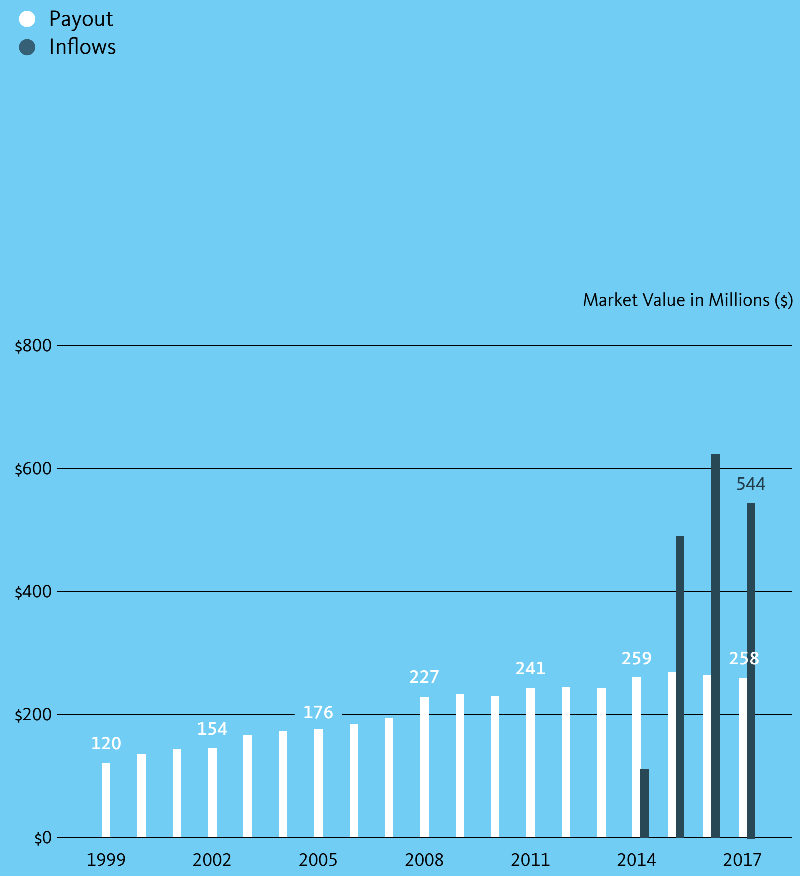
Endowment
Asset Allocation

	Market Value in Billions ($)	Portfolio Weight (%)	Policy Weight (%)	Overweight / (Underweight)
Public Equity	4.7	43.4	42.5	0.9
Fixed Income	1.2	10.5	12.5	(2.0)
Other Investments	3.8	35.9	45.0	(9.1)
Absolute Return	1.9	18.0	23.0	(5.0)
Private Equity	1.2	11.5	11.5	0.0
Real Estate	0.5	4.5	7.5	(3.0)
Real Assets	0.2	1.9	3.0	(1.1)
Cash	1.1	10.2	0.0	10.2
Total	$10.8 Billion	100.0%	100.0%	

Endowment Performance

	Market Value in Millions ($)	Annualized Performance (%)				
		1 year	3 years	5 years	10 years	20 years
Endowment	10,752	15.1	5.6	9.4	5.3	7.3
Policy Benchmark		12.5	4.6	8.0	4.7	6.7
Value Added		2.6	1.0	1.4	0.6	0.6
Public Equity	4,670	23.8	5.3	11.1	4.2	6.2
U.S.	1,982	17.0	5.4	12.4	6.0	6.5
Non-U.S. Developed	1,762	35.4	2.6	9.4	1.9	—
Emerging Markets	926	23.6	3.4	5.3	2.6	—
Fixed Income	1,131	3.2	2.3	3.2	5.5	6.3
Core	373	(1.2)	1.5	2.2	4.1	5.6
High-Yield	356	10.3	4.2	6.9	7.3	—
Emerging Market Debt	160	4.0	—	—	—	—
TIPS	242	0.1	0.9	0.4	4.6	—
Other Investments	3,855					
Absolute Return	1,932	4.8	2.1	5.9	3.6	—
Private Equity	1,234	21.1	19.3	19.6	12.6	18.1
Real Estate	486	8.6	12.3	12.3	1.6	—
Real Assets	203	6.5	(5.1)	(0.1)	—	—
Cash	1,096	1.1	1.2	1.4	—	—

Endowment
Annual Payout



Endowment
Policy Benchmarks

	Benchmark Component	June 30, 2016	June 30, 2017
Public Equity		43.2%	42.5%
U.S.	Russell 3000 Tobacco Free Index	16.1%	21.0%
Non-U.S. Developed	MSCI World ex-U.S. (net dividends) Tobacco Free	10.4%	14.0%
Emerging Markets	MSCI Emerging Market (net dividends)	6.3%	7.5%
Global	MSCI All Country World Index (net dividends)	10.4%	0.0%
Fixed Income		13.0%	12.5%
U.S. Core	Barclays U.S. Aggregate Bond Index	5.2%	5.0%
High-Yield Debt	Merrill Lynch High Yield Cash Pay Index	2.6%	2.5%
Emerging Market Debt	JP Morgan Emerging Markets Bond Index Global Diversified	2.6%	2.5%
TIPS	Barclays U.S. TIPS	2.6%	2.5%
Other Investments		43.8%	45.0%
Absolute Return	HFRX Absolute Return Index (Prior to February 2016 blended weighted composite)	24.5%	23.0%
Private Equity	Actual Private Equity Returns	9.4%	11.5%
Real Estate	NCREIF Funds Index-Open End Diversified Core Equity Index	7.0%	7.5%
Real Assets	Actual Real Assets Returns	2.9%	3.0%

Pension, planned.

The University's Pension program dates to 1904, and the current Pension plan was designed in 1961 to provide a basic retirement income for the people who make UC what it is: the best in the world.

Our core obligation is to provide sound management of the funds within the bounds of the Board of Regents' funding policy. To achieve this goal, the UC Pension plan invests across various asset types such as equities and income securities (public and private), real estate, real assets, absolute return and strategic opportunities.

This year was a very good one for the Pension. The Pension earned 14.5%, primarily from the public equities markets which were up 22.5% in our portfolio. Our assets stand at $61.6 billion, up $7.5 billion from the end of the last year as a result of market gains and value-add offsetting outflows of about $300 million.

The discount rate is the expected return on investment for the Pension, and for more than 20 years, this rate was 7.5%. In 2015, we worked with the Office of the President to review our long-term expectations, and given the low return and inflation environment, the rate was lowered to 7.25%. Every 0.25% decrease in the discount rate increases our liabilities by approximately $2 billion. This year the Regents took action to increase employer contribution to 15% from 14% beginning in July 2018.

This year's strong returns drove the growth in assets to $61.6 Billion improving the funding of the pension. We expect our funding ratio ending June 30, 2017 to improve to 82% on a market value basis from 78%.

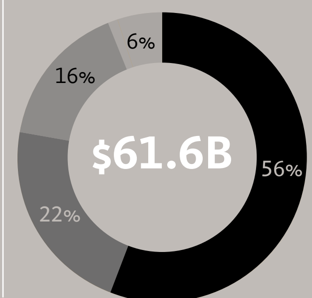
We continue to prudently implement the Pension asset and risk allocation changes approved by the Board that became effective July 2016. And with a projected uptick in retirements over the next 5 to 10 years, we work to stay focused on the long term, taking steps to improve the management of the Pension and improving outcomes for our pensioners.

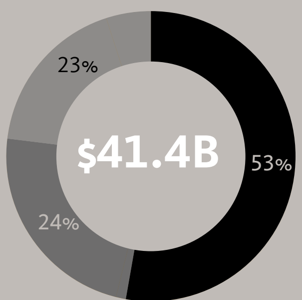
Pension
Asset Allocation

- Public Equity
- Fixed Income
- Other Investments
- Cash

Market Value in Billions ($)

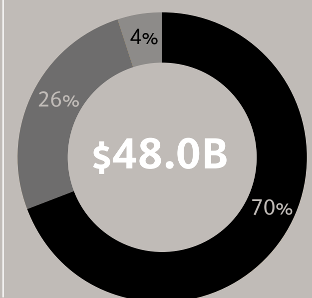
June 30, 2017

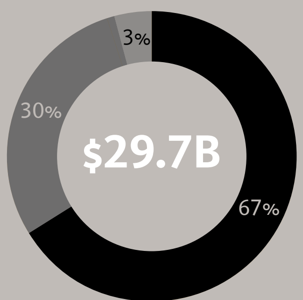




5 Years Ago

10 Years Ago





20 Years Ago

Pension
Investment Highlights

15.3% Gross Return

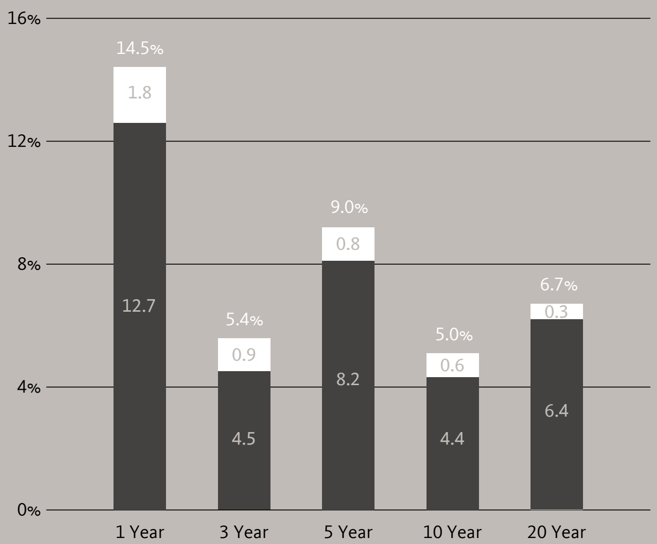
14.5% Net Return

Market Value in Billions ($)

June 30, 2016	$54.1B
Market Gains	$6.8B
Value Added	$1.0B
Net Cash Flow	($0.3B)
June 30, 2017	$61.6B

Pension
Annualized Net Return

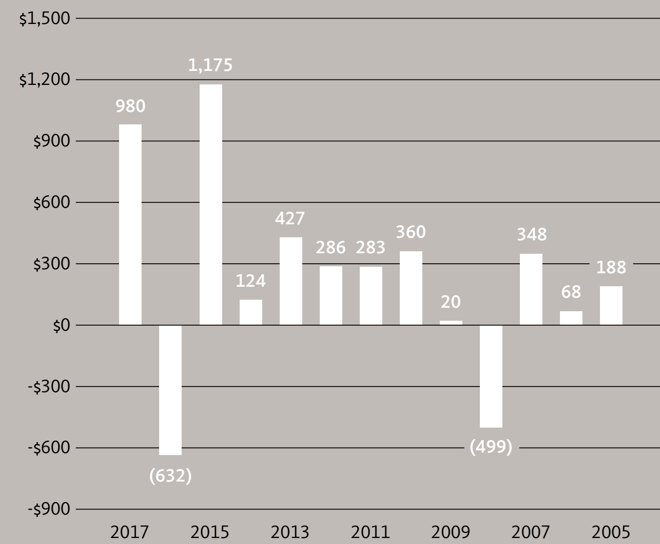
- Value Added
- Benchmark



Pension
Dollar Value Added

- Dollar value added is what we earned beyond what we would have earned if we were passively invested in the market.

Value in Millions ($)



Pension
Asset Allocation

	Market Value in Billions ($)	Portfolio Weight (%)	Policy Weight (%)	Overweight / (Underweight)
Public Equity	34.7	56.3	52.2	4.1
Fixed Income	13.4	21.7	21.5	0.2
Other Investments	9.8	15.9	23.5	(7.6)
Absolute Return	3.0	4.9	7.3	(2.4)
Private Equity	2.8	4.6	7.5	(2.9)
Real Estate	3.1	5.0	6.3	(1.3)
Real Assets	0.9	1.4	2.4	(1.0)
Cash	3.7	6.1	2.8	3.3
Total	$61.6 Billion	100.0%	100.0%	

Pension
Performance

	Market Value in Millions ($)	Annualized Performance (%)				
		1 year	3 years	5 years	10 years	20 years
Pension	61,615	14.5	5.4	9.0	5.0	6.7
Policy Benchmark		12.7	4.5	8.2	4.4	6.4
Value Added		1.8	0.9	0.8	0.6	0.3
Public Equity	34,690	22.5	6.1	11.6	4.4	6.0
U.S.	17,698	21.1	8.4	14.3	6.9	6.9
Non-U.S. Developed	11,686	31.4	3.6	10.1	2.1	—
Emerging Markets	5,306	17.9	0.7	3.7	1.8	—
Fixed Income	13,364	2.9	2.8	3.0	5.4	6.5
Core	8,149	1.3	2.8	2.9	4.9	6.2
High-Yield	2,064	11.0	4.4	7.1	7.4	—
Emerging Market Debt	1,461	5.1	3.5	3.9	6.3	—
TIPS	1,690	(0.1)	0.8	0.5	4.6	—
Other Investments	9,774					
Absolute Return	3,018	4.8	2.1	5.9	3.6	—
Private Equity	2,800	14.0	11.0	13.2	9.2	15.9
Real Estate	3,101	7.7	12.4	12.1	1.0	—
Real Assets	855	8.6	(4.7)	0.1	—	—
Cash	3,787	1.0	1.3	2.1	—	—

Pension
Retiree Member Profile

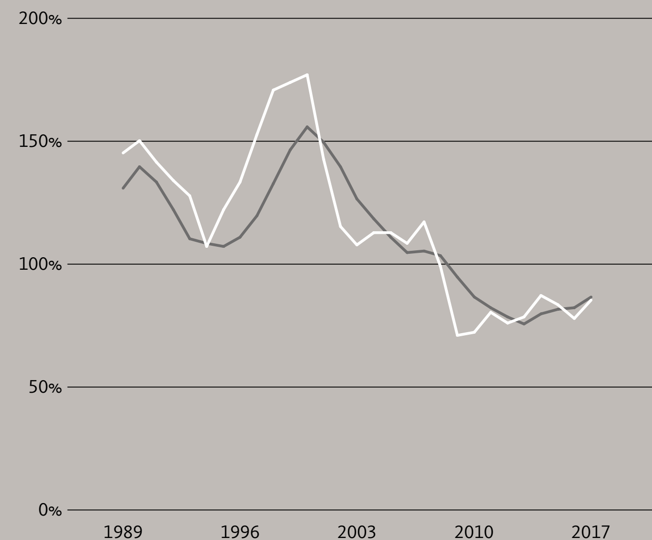
As of June 30, 2017

Average Annual Benefit	$59,941
Average Monthly Benefit	$4,995
Average Service Credit at Retirement	22 yrs
Average Age	72 yrs
Average Age at Retirement	62 yrs

Pension
Funded Ratio

Funded Ratio (Market)
Funded Ratio (Smoothed)

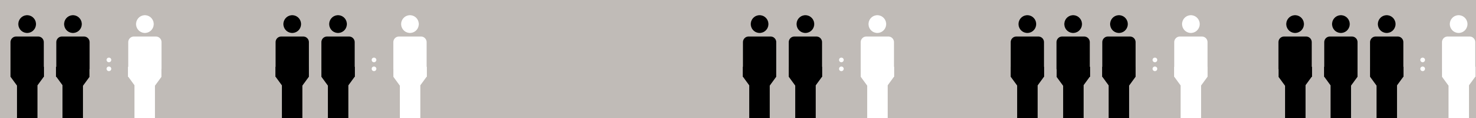
As of June 30, 2016



Pension Membership

As of June 30, 2017

	June 30, 2017	June 30, 2016	5 years ago	10 years ago	20 years ago
Total Members	237,728	233,214	204,023	193,329	133,545
Active Members	129,382	128,513	115,568	122,317	92,182
Retired Members	72,995	70,077	56,296	45,442	29,455
Inactive Members (Vested)	35,351	34,624	32,159	25,570	11,908
Active to Retiree Ratio	2 Active : 1 Retiree	2 Active : 1 Retiree	2 Active : 1 Retiree	3 Active : 1 Retiree	3 Active : 1 Retiree



Pension Policy Benchmarks

	Benchmark Component	June 30, 2016	June 30, 2017
Public Equity	MSCI All Country World Index IMI (net dividends) Tobacco Free as of July 1, 2016. Prior was a blend of underlying components	54.9%	52.3%
U.S.	Russell 3000 Tobacco Free Index	24.1%	—
Non-U.S. Developed	MSCI World ex-U.S. (net dividends) Tobacco Free	15.0%	—
Emerging Markets	MSCI Emerging Markets (net dividends)	7.0%	—
Opportunistic	MSCI All Country World Index (net dividends)	8.8%	—
Fixed Income		22.3%	21.5%
U.S. Core	Barclays U.S. Aggregate Bond Index	12.4%	13.4%
High-Yield Debt	Merrill Lynch High Yield Cash Pay Index	2.6%	2.9%
Emerging Market Debt	JP Morgan Emerging Markets Bond Index Global Diversified	2.6%	2.4%
TIPS	Barclays U.S. TIPS	4.7%	2.8%
Other Investments		22.8%	23.5%
Absolute Return	HFRI Fund of Funds Index effective July 2016. Prior was a combination of weighting of HFRX Absolute Return and HFRX Absolute Return Market Directional since 2009	6.2%	7.3%
Private Equity	Actual Private Equity Returns	8.0%	7.5%
Real Estate	NCREIF Funds Index-Open End Diversified Core Equity Index	5.5%	6.3%
Real Assets	Actual Real Assets Returns	3.1%	2.4%
Cash	Income on Two-Year U.S. Treasury Note	0.0%	2.7%

Design your retirement.

The Regents created our Retirement Savings program in August 1967 to allow members to voluntarily invest into a variable annuity. By the end of that first year, around 1,000 participants had saved $500,000.

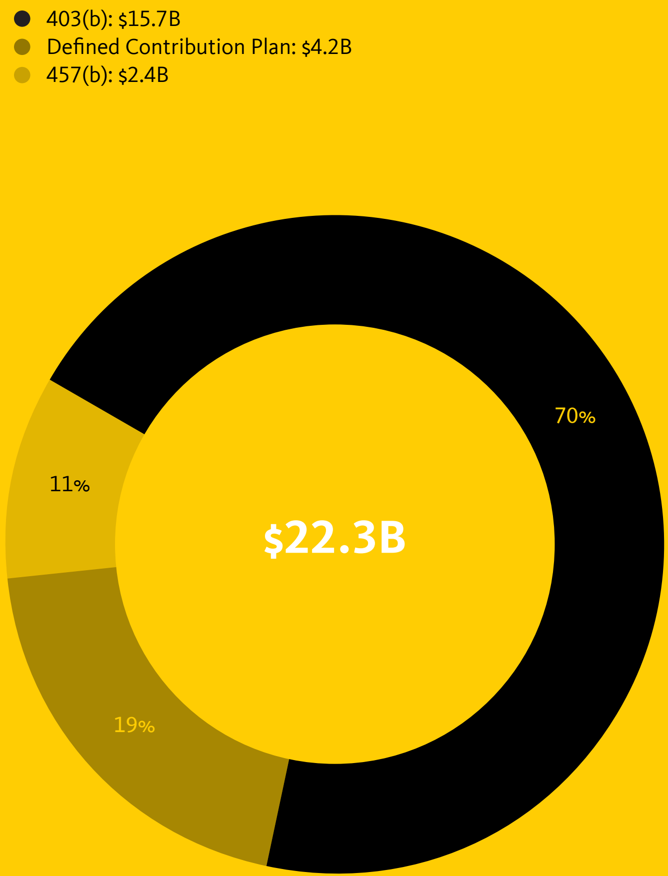
Today, over 310,000 participants save for their future. Assets have grown to over $22.3 billion, making our Retirement Savings the second-largest public defined contribution (DC) plan in the U.S. and our 403(b) plan the largest in the country.

The best thing our participants can do to secure a better future is to save more. So we give them opportunities to invest their savings into a three-tiered investment lineup. Tier 1 is the default option: our Target Date Funds called UC Pathway. With assets of $6.1 billion, Pathway has more than doubled in the past five years. Tier 2 includes 14 core options that participants can use to build their own asset allocation. Finally, Tier 3 is a brokerage window that offers participants access to a menu of third party mutual funds.

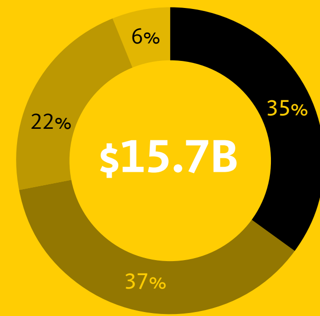
The creation of the investment lineup has been guided by our core principles: to deliver the best-in-class DC plan focused on participant outcomes through superior performance and cost management.

Through our ongoing effort to enhance the Retirement Savings program, our participants now have access to an industry-leading lineup with an average management fee of just 0.07%, well below industry standards.

Retirement Savings
Plan Allocation

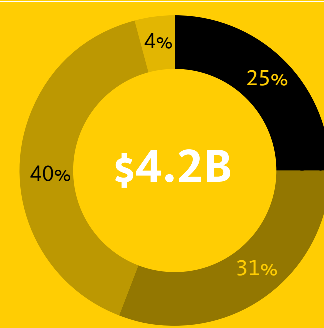


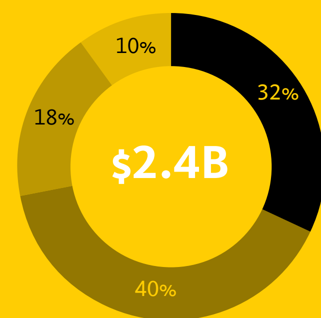
Retirement Savings
Asset Allocation



403(b)
- Public Equity: $5.5B
- Asset Allocation: $5.8B
- Fixed Income: $3.4B
- Brokerage Link: $1.0B

Defined Contribution Plan
- Public Equity: $1.1B
- Asset Allocation: $1.3B
- Fixed Income: $1.7B
- Brokerage Link: $0.1B





457(b)
- Public Equity: $0.8B
- Asset Allocation: $1.0B
- Fixed Income: $0.4B
- Brokerage Link: $0.2B

Market value in Billions ($)

Capital, working.

Our campuses and medical centers rely on Working Capital to pay for mission-critical projects and programs that make UC the gold standard of public universities in the U.S.

Working Capital is invested in both the Total Return Investment Pool (TRIP) and the Short Term Investment Pool (STIP). Total working capital ended the year at $14.2 billion, flat from the previous fiscal year after taking into account the payout of investment income and campus withdrawals to fund projects.

STIP, a high-quality, short-maturity portfolio, is managed to safeguard assets and ensure adequate daily liquidity to meet the University's cash needs and external rating agency requirements. The Cash and Liquidity Management (UC Treasury) team, which provides banking services to our campuses and medical centers became a part of our office in 2015. We manage and forecast the system wide cash flows in and out of STIP, totaling $82 billion annually. Over the course of a year, we also process 93 million banking transactions, 20 million credit card transactions and $1 billion in credit card sales.

The investment objective of the TRIP portfolio is to produce higher long-term returns than STIP through an asset and risk allocation geared to an intermediate-term horizon. TRIP assets ended the year unchanged at $8.9 billion after outflows to campuses of approximately $600 million during the year.

As with all our products, we continue to work to reduce costs in our Working Capital portfolios. We project savings in TRIP of $20 million annually due to the shift to passive implementation of the public equity portfolio and restructuring of the absolute return portfolio to more liquid, lower cost strategies.

This year, we've also worked with the Office of the President to have the external debt rating agencies consider TRIP assets as part of the University's overall liquidity.

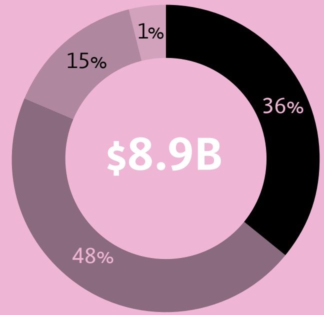
Over the past three years we have worked with campuses to optimize their capital and have shifted more than $1.5 billion to TRIP from STIP, which has generated additional annual income for campuses of $30 million.

We continue to assess overall liquidity needs and look for ways to reduce fees, enhance investment results and make our capital work.

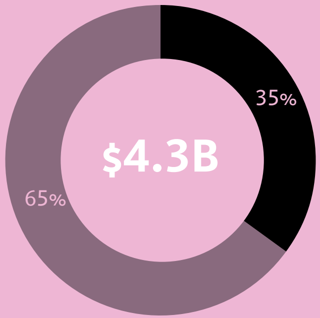
Total Return Investment Pool
Asset Allocation

- Public Equity
- Fixed Income
- Other Investments
- Cash

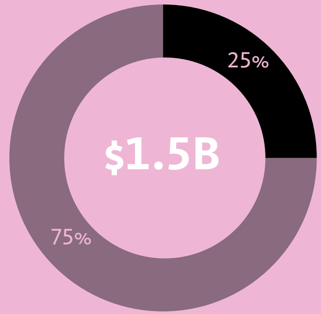
June 30, 2017



5 Years Ago



Inception
August 30, 2008



Market value in Billions ($)

Total Return Investment Pool
Investment Highlights

7.9%
Gross Return

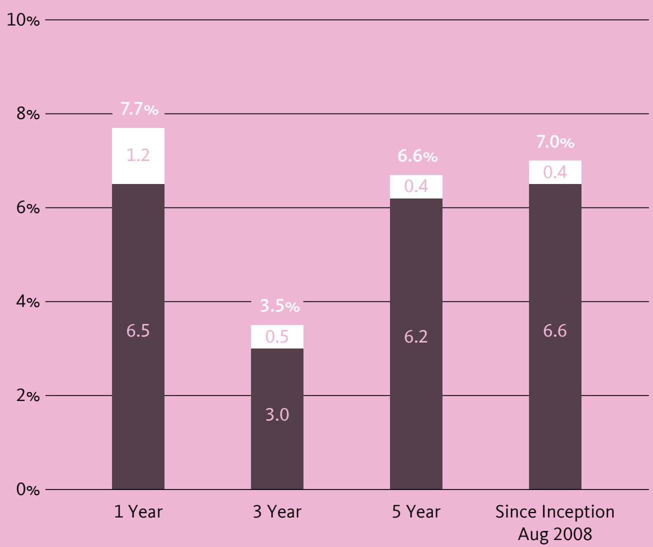
7.7%
Net Return

Market Value in Billions ($)

June 30, 2016	$8.9B
Market Gains	$0.5B
Value Added	$0.1B
Net Cash Flow	($0.6B)
June 30, 2017	$8.9B

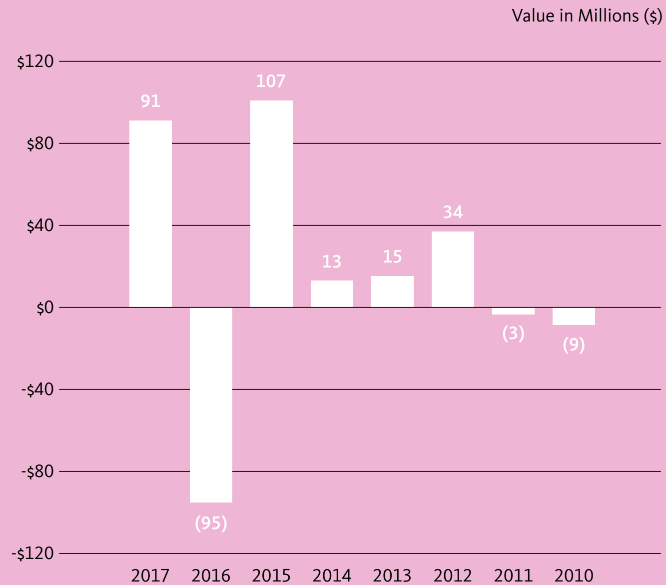
Total Return Investment Pool
Annualized Net Return

- Value Added
- Benchmark



Total Return Investment Pool
Dollar Value Added

- Dollar value added is what we earned beyond what we would have earned if we were passively invested in the market.



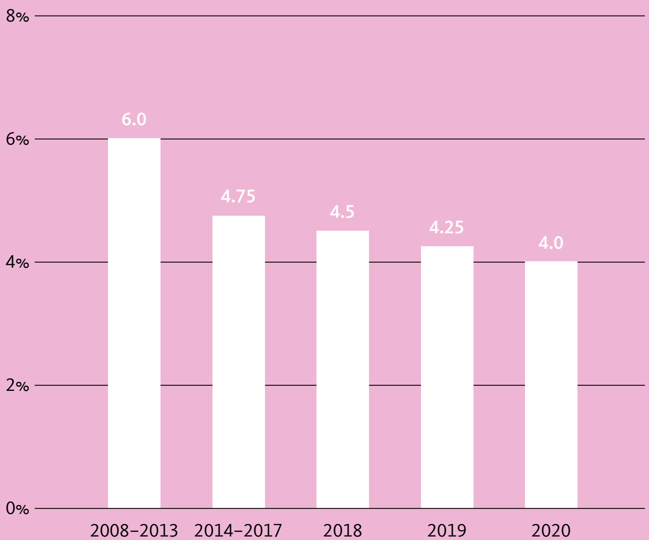
Total Return Investment Pool
Asset Allocation

	Market Value in Billions ($)	Portfolio Weight (%)	Policy Weight (%)	Overweight / (Underweight)
Growth	3.3	36.5	35.0	1.5
Public Growth	3.2	35.5		
Private Growth	0.1	1.0		
Income	4.2	47.7	50.0	(2.3)
Public Income	3.8	42.9		
Private Income	0.4	4.8		
Absolute Return	1.3	14.6	15.0	(0.4)
Cash	0.1	1.2	0.0	1.2
Total	$8.9 Billion	100.0%	100.0%	

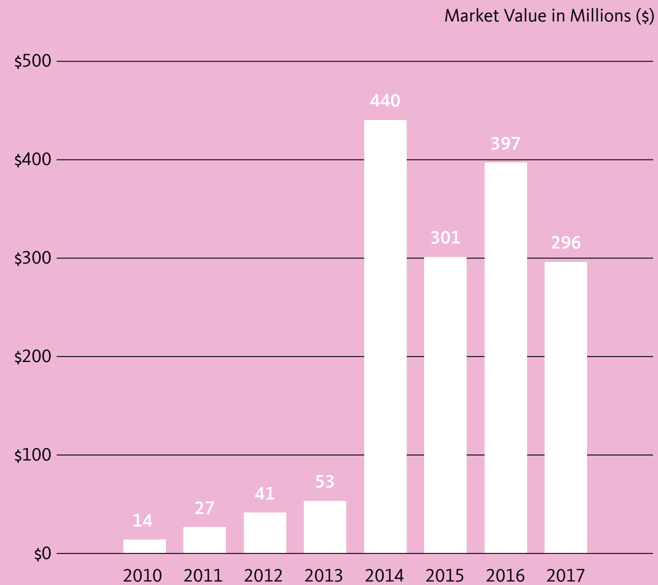
Total Return Performance

	Market Value in Millions ($)	Annualized Performance (%)			
		1 year	3 years	5 years	7 years
Total Return Investment Pool	8,948	7.7	3.5	6.6	7.3
Policy Benchmark		6.5	3.0	6.2	6.9
Value Added		1.2	0.5	0.4	0.4
Growth	3,266	19.1	4.9	11.9	11.4
Public Growth	3,176	17.6	4.9	11.9	11.4
Private Growth	90	29.0	—	—	—
Income	4,267	2.1	2.8	3.6	5.0
Public Income	3,840	1.6	2.9	3.6	5.0
Private Income	427	5.8	—	—	—
Other Investments	1,306	3.3	0.5	—	—
Absolute Return	1,306	3.3	0.5	—	—
Cash	109	1.4	0.7	—	—

Total Return Investment Pool
Payout Policy



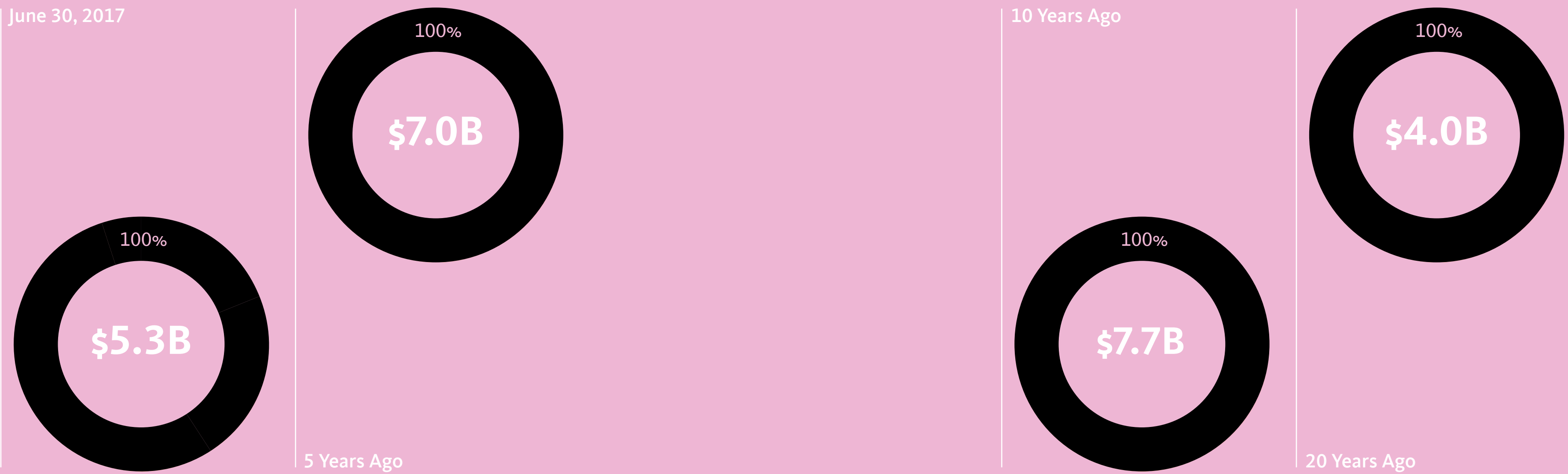
Total Return Investment Pool
Annual Payout



Short Term Investment Pool
Asset Allocation

● Fixed Income

Market Value in Billions ($)



Short Term Investment Pool
Investment Highlights

1.3%
Gross Return

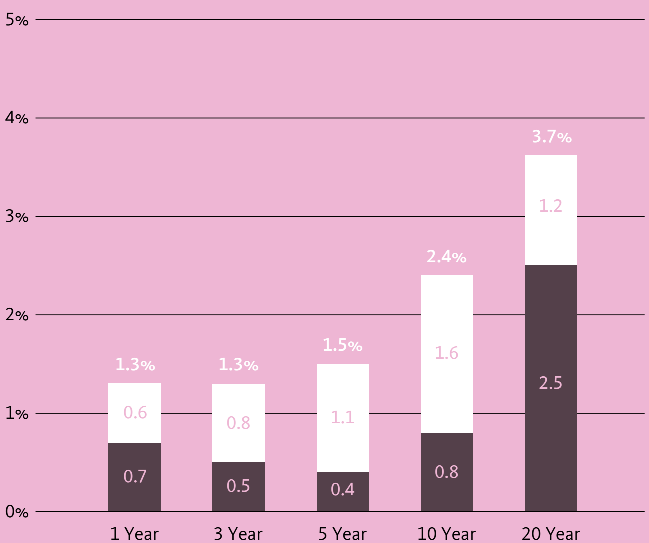
1.3%
Net Return

Market Value in Billions ($)

June 30, 2016	$5.3B
Market Gains	$0.1B
Value Added	$0.1B
Net Cash Flow	($0.2B)
June 30, 2017	$5.3B

Short Term Investment Pool
Annualized Net Return

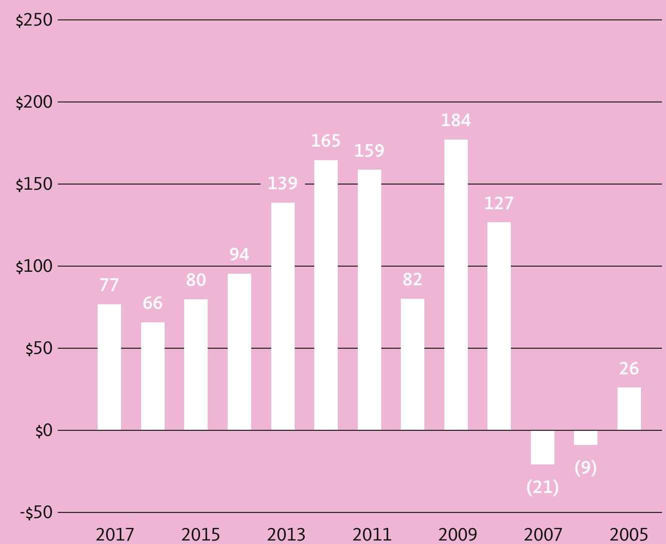
- Value Added
- Benchmark



Short Term Investment Pool
Dollar Value Added

- Dollar value added is what we earned beyond what we would have earned if we were passively invested in the market.

Market Value in Millions ($)



Total Return & Short Term
Policy Benchmarks

	Benchmark Component	Policy Weight
Total Return		
Growth	MSCI All Country World Index IMI (net dividends)	35.00%
Income	Barclays U.S. Aggregate Bond Index	50.00%
Other Investments		15.00%
Absolute Return	HFRX Absolute Return Index	15.00%
Short Term		
Fixed Income	Weighted Average of Income Return on a Constant Maturity Two-Year U.S. Treasury Note and the Return on U.S. 30-Day Treasury Bills	100.00%

UC's captive insurance, Fiat Lux Risk and Insurance Company, was formed in 2012 as a single-parent captive to strategically finance risk across our entire system to reduce the net cost of loss, create greater financial stability and protect our resources.

Fiat Lux is the largest U.S. university captive insurance program with assets more than $900 million and liabilities close to $800 million.

While the captive insurance company is a separate legal entity subject to corporate formalities, its owner (UC Regents) and the Fiat Lux Board has direct involvement in and influence over the captive's major operations, including underwriting, claims management, policy form and investments.

Fiat Lux came to us this year with a big request: would we work with them to assess their board's risk appetite, draft a new investment policy and then develop a custom portfolio strategy to manage their assets? Of course, we said yes.

Our new strategy has only been in place for a few months, but Fiat Lux has already seen results: over $20 million in either saved premiums or new annualized revenues, with significant additional savings in development. Future growth plans in the next fiscal year include an incorporated cell captive for employee voluntary benefits, other University systems and additional coverages.

Small is beautiful.

We work at one of the biggest universities in the world, producing some of the best research, innovations and scientific breakthroughs on the planet. And given the monumental task of managing a breathtaking amount of capital — $110 billion as of this past fiscal year — across a variety of products, you'd probably assume we're a giant organization thinking big thoughts and making big plans. But that's not us. To manage this much money and live up to the promises we make to our stakeholders, we actually think and act small.

- We keep the number of decisions we're making small so we can spend more time making right decisions.
- We keep the number of investments we're managing small to ensure we're picking the right investments.
- We keep the number of relationships we manage small to make them more meaningful.
- We keep our team small to maintain a culture of accountability and high performance.
- We keep learning and listening from one another to understand the small details to collaborate more.

By staying small, we may do fewer things, but we work hard to do those things better than anybody else. And it's that focus on excellence we believe will allow us to live up to the significant responsibilities our clients and stakeholders have entrusted in us. Thinking small is, in a way, our key to delivering a beautiful future for everyone at UC.

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Office of the Chief Investment Officer of the Regents

Risk

UNIVERSITY
OF
CALIFORNIA

Risk rules.

Jagdeep Singh Bachher
Chief Investment Officer and
Vice President of Investments

Three years ago, we set out to answer a question: How can our products best fulfill their mandate? Working together as a team, we pored over the literature and picked the brains of recognized investment leaders and like-minded peers. The result was a set of 10 principles — or, as we like to call them, pillars — that guide us day in and day out.

Given the nature of what's going on in the world economy, one of these pillars, Risk Rules, has been a particular focus for us. Here's why: though standard risk tools are crucial in helping us understand complex and nuanced investments, they won't guide us through the next market crash.

So I set out to bring in someone with deep experience and vision, someone who understood we needed to manage risk, not just measure it. We found that person in Rick Bookstaber, who joined our team as chief risk officer two years ago. Together, we've worked to shift our culture to one that takes a more innovative approach to risk. Today, risk management isn't just a function or a department. Everyone on our team is now a risk manager.

We've also developed new, forward-looking risk management systems and formed valuable partnerships so we can better predict how an event will affect our products and our returns.

Using our new risk management approach, we're making every investment decision with our eyes wide open to its risk now — and in the future.

The 10 pillars of centennial investing.

1
Less is more.

"You have to work hard to get your thinking clean to make it simple. But it's worth it in the end because once you get there, you can move mountains."
Steve Jobs

We believe in high-performance teams working collaboratively to manage a concentrated portfolio of high-quality assets. That's why we are working actively to reduce the number of decisions we have to make, the number of line items in our portfolio and the number of external managers we use. The result is an agile, world-class team with a laser focus on the areas where we can outperform the market.

2
Risk rules.

"In investing, what is comfortable is rarely profitable."
Robert Arnott

We are working to shift the culture of UC Investments so that everyone on our team becomes a risk manager. We're also allocating our assets according to the risk factors that drive returns to create more diversity and generate more return per unit of risk. Formalizing our expectations around risk will enable us to assess a single portfolio while also respecting the changing nature of each of our product lines' risks.

3
Concentrate.

"Wide diversification is only required when investors do not understand what they are doing."
Warren Buffett

We are working to construct portfolios from a concentrated set of assets that we understand deeply, as opposed to holding many assets that we barely understand, that cost us more to manage and that are passively replicable. By reducing the number of investments in our portfolios, we believe we can reduce unwanted risks and increase desired returns, while balancing the need to be proactive with the need to adhere to the diligence requirements of our organization.

4
Creativity pays.

"The person who goes farthest is generally the one who is willing to do and dare. The sure-thing boat never gets far from shore."
Dale Carnegie

We are focused on developing competitive portfolios, even if, at times, that means taking an unconventional or uncomfortable stance. One way we are building a culture of innovation is by developing a dedicated innovation team in our organization — a rarity in the world of institutional investment — to incubate, validate and develop creative vehicles that leverage our competitive advantages.

5
Build knowledge.

"An investment in knowledge pays the best interest."
Benjamin Franklin

We consider ourselves remarkably lucky to be sitting at the heart of such a knowledge-rich university environment, and we are working to get the right systems, policies and processes in place to capitalize on it. We are putting an emphasis on building a culture of collaboration to break down silos and share information across the organization. We are also investing in high-quality data infrastructure to track portfolios, risks and networks.

6
Team up.

"Talent wins games, but teamwork and intelligence wins championships."
Michael Jordan

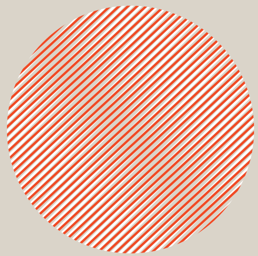
We realize that to be successful, we must attract the highest-caliber people who are in alignment with our culture and our long-term approach to investing. We target our recruiting where we are most likely to be successful. The gray: those who've had successful careers in the private sector and want a change. The green: bright young recruits who want to accelerate their careers. The grounded: loyal UC alums and others who want to live in California.

7
What makes UC, UC.

“If you don’t have a competitive advantage, don’t compete.”
Jack Welch

As the investment organization for one of the premier public research institutions in the world, we have an abundance of characteristics that, if cultivated appropriately, should be a persistent source of high-quality investment opportunities. Our innovation ecosystem is unparalleled on a global scale, and because we sit at the center of it, we believe we can leverage our unique characteristics in ways that drive investment returns.

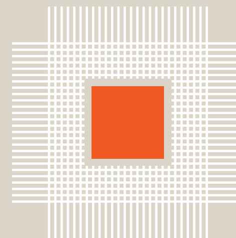
8
Perfect alignment.



“Control your expenses better than your competition. This is where you can always find the competitive advantage.”
Sam Walton

Now more than ever, we need to fully understand what we’re paying for. If a third-party manager isn’t willing to provide a detailed breakdown of how they make their money from managing our money, then we should be willing to pull our capital and walk away. By having complete transparency and a better understanding of our investment risks, we will reduce misalignment of interests and capture risk-free returns.

9
Man meets machine.



“You are cruising along, and then technology changes. You have to adapt.”
Marc Andreessen

Sitting on our perch here in Silicon Valley, we believe we can use technology to help us streamline and strengthen operations to level the playing field between us and the private financial-services industry. In the years ahead, we’ll be working with innovative startups to better understand and manage our portfolios and gain greater access to unique markets that had previously been too expensive for us to enter.

10
Centennial performance.

“We should all be concerned about the future because we have to spend the rest of our lives there.”
Charles Franklin Kettering

We think of ourselves as an organization that invests for the next 100 years. Our centennial orientation drives us to assess our portfolio in ways that consider the long-term, fundamental challenges facing society like climate change, human rights or corporate governance. We’re also working to incorporate a broader set of risks into our decision-making than organizations with shorter time horizons.

Q&A with Richard Bookstaber

Chief Risk Officer
UC Investments

How is risk management different here at UC as an asset owner than in the private sector, like banks and hedge funds, and in the regulatory arena?
For a bank or a hedge fund things can change from day to day. There is a lot of trading and a lot of leverage, so things can go south quickly, and often you can't get out of the way of a problem fast enough. In terms of the management of systemic risk at the regulatory level, it really is a different animal because you might see what is happening, but the political constraints make it difficult to take action. The asset owner world is in some sense the sweet spot for risk management because you have time to see what is coming and you also have the ability to make adjustments before it hits.

Your latest book, The End of Theory, builds off things you learned about risk from the 1987 crash, the Long-Term Capital Management hedge fund and, of course, the aftermath of 2008 crisis. Are there general lessons in these for how we fail in responding to crises?
It's hard to find general rules, but I can think of two things. First is missing the implication of changes in the world. There were new strategies — portfolio insurance in 1987 and new types of financial instruments coming into 2008 — yet people were using the same standard risk systems and methods.

Also, sometimes it's just that things slip. If something is coming from a new direction, even if you have the analysis and it's staring you in the face, it just doesn't catch anyone's attention. Really, that happens. Or, it's noticed but no one takes action; analysis paralysis. Talking about the problem meeting after meeting but no one owning it and pulling the trigger.

Is it a matter of inertia? Or not wanting to rock the boat?
It's partly because of inertia. It's also partly because of a lack of courage, because taking action means reducing exposure and that means lower returns if the risk doesn't end up realized, which happens more often than not. But mostly I would chalk up the failure to act to wishful thinking. It's like people just can't believe something is wrong — or that it can get any worse — because they have no past experience with it. It could be that their own experience is limited or maybe the sort of dynamic has never occurred before.

Would you say this is just the way people are — wishful thinkers who go with the flow?
Well, maybe; but then I guess that is one reason not everyone should be a risk manager! But really, this is a natural result when quants [quantitative analysts] are sitting in cubicles running their models and just throwing numbers over the wall. They are doing the risk analysis, but the decision makers don't own it; there isn't top-level support. And you actually need more than support; they have to be in the process because each crisis is new and coming from different areas.

You've developed a new approach to looking at risk: agent-based models. How does the agent-based model approach address the problems you've just discussed?
During market dislocations and times of crisis, there are so many moving parts, with all sorts of markets and institutions interacting. Yet the fact of the matter is that our standard approaches can't deal with crises because they do not build in how a market shock might affect the actions of one institution — for example a hedge fund having a margin call and being forced to liquidate — and how that might in turn affect another institution — maybe a bank or dealer who then stops making markets to preserve its capital. I believe agent-based models can deal with these interactions and their resulting changes in the market environment. Agent-based modeling tries to analyze what each agent — banks, hedge funds, pension and endowment funds — will do as a situation develops and worsens, and thus how the crisis will propagate.

But aren't you still in the realm of the quants throwing the results of a different model over the cubicle?
The key is that the model has to be part of the risk discussion. People still need to sit around the table and think things

through, basically work through different stories and plot lines for how a risk might propagate. And you can do that with an agent-based model because it's not a jumble of equations; it follows the story of how each market and each agent, that is, each institution, is acting as the crisis runs its course. This is what people do all the time when it comes to investments, but not so much when it comes to risk. However, they really are two sides of the same coin.

How is UC Investments using agent-based modeling to manage its risk?
The path to integrating this approach at UC, which we call Risk Management Version 3.0, has been first to build the model, and then to pull together the data to run it. Getting the data is as difficult a task as the model itself. We need to know things like where leverage is lurking in the market, where there is crowding in strategies, and other things that you can't just pull up on a Bloomberg machine. Then we need to huddle with our partners to determine what scenarios are of the greatest concern. We are not to the point of being able to push a button and get a full-body scan; we need to point the model on a particular target.

The end result is a Version 3.0 Risk Report that shows where our portfolio will be sitting as a particular crisis washes its way through the markets. We are having discussions all the way through this process — from defining the agents of the model, to pulling together the critical data on leverage, illiquidity and concentration, to building and running the scenarios — so it gets integrated into our risk-management thinking.

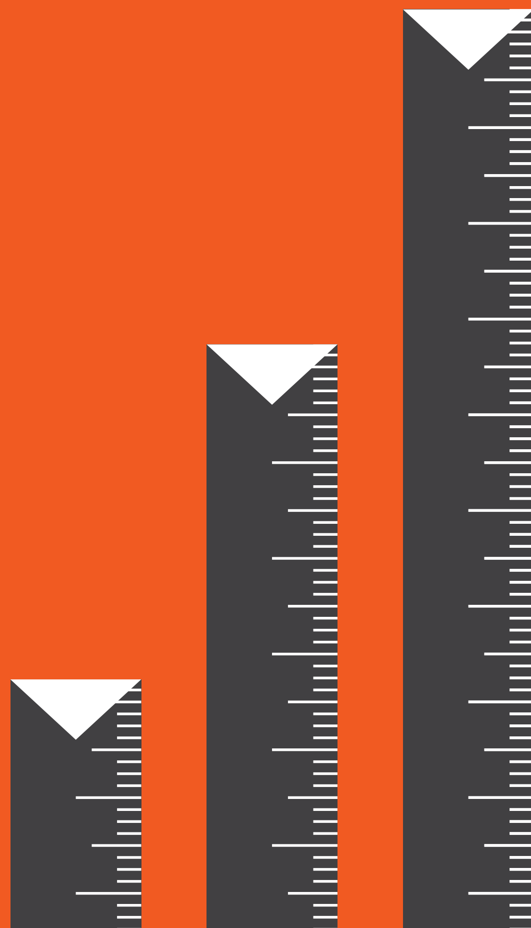
We are all risk managers.

Risk is at the core of the UC Investments process, one that starts with the Regents setting our risk tolerance to achieve the objectives for the respective products and stakeholders. We use an integrated approach to risk management and have worked to create a common culture to support that approach: we have common ownership of our portfolio risks, and we all share responsibility for the entire portfolio.

Rather than focus on filling asset buckets based on asset allocation targets, we aim to seize opportunities however they arise, with the best asset class to execute on that opportunity. This puts more demands on risk management and requires input and support across our entire investment team, from the Regents to the CIO to the product teams.

How we measure risk.

At UC Investments, we apply three levels of quantitative risk measurement to our decision making — Risk 1.0, 2.0 and 3.0 — with each level building on, not eliminating, the previous one's value.



Risk 1.0: The Future as History

This is the standard risk management approach that's been used for over two decades. Here, the returns of the current portfolio are evaluated by looking back at history and trying to answer these questions: If the current portfolio had been held over the past, how much would its returns have varied? How volatile would it have been?

Looking at the past two years of our products as a guide to evaluating the future risk, we find our General Endowment Pool (GEP) has an annualized volatility of 7.2% and UC Retirement Plan (UCRP) has an annualized volatility of 7.5%. Putting this in intuitive terms, we should not be too surprised if, over the course of a year, we find returns vary by seven percent or so. In more technical terms, the 7.2% is the one standard deviation range for returns, and we can expect returns to vary within that range with about a 70% probability.

To add some context, applying this risk level to a portfolio holding only the S&P 500 gives a volatility of 10%. So both GEP and UCRP are about three-fourths as volatile as holding the S&P 500 index.

But the recent past has not been typical. Over a longer time period, the S&P 500 has been more in the 15- to 20-percent range, and our portfolios have tracked closer to 10%, so still about three-fourths the risk of holding the S&P 500, but higher risk in absolute terms.

We'll discuss more about the implications of our current low-volatility regimes later in this report, but the important point here is that low volatility now can set the stage for higher risk down the road.

Risk Volatility
Endowment & Pension

	Endowment (%)	Pension (%)
Portfolio	7.2	7.5
Public Equity	9.7	10.4
Fixed Income	2.9	2.7
Absolute Return	3.3	3.4
Private Equity	22.4	20.7
Real Estate	11.3	11.9
Real Assets	28.5	32.5
Cash	0.3	0.2

Risk 2.0: What if?

After the 2008 crisis, it became apparent that Risk 1.0 failed because the risks in the crisis did not look like those of the past. So a new way to look at risk arose, Risk 2.0: stress and scenario analysis.

With stress analysis, we are not wedded to historical asset performance as the guide. Instead, we hypothesize about the effect of various scenarios, each of which could include a variety of events and market stresses. Three illustrative scenarios we are considering in the current environment are:

- **Stresses in specific markets**
"What will happen to our portfolios if stocks drop by 10 percent?"

- **Multi-faceted scenarios**
"What will happen to our portfolios if China has a credit crunch, with all of the market dislocations that this would imply?"

- **Stresses in history, Risk 1.0-style**
"What would happen to our portfolios if the 2013 "Taper Tantrum" were to occur again?"

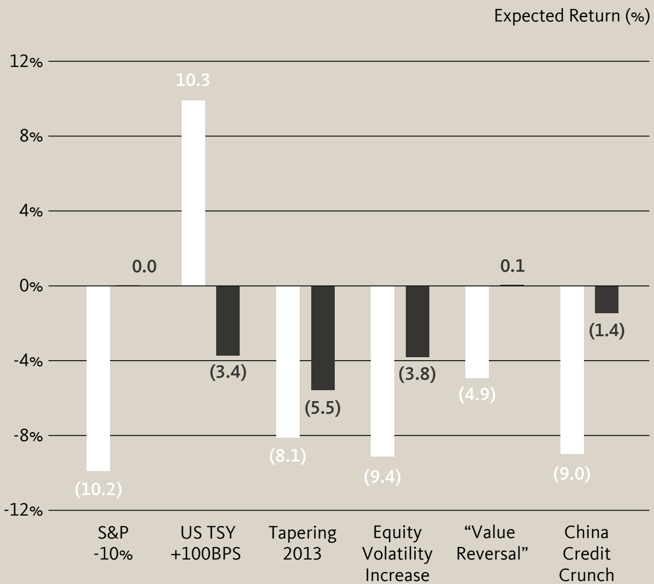
Since we don't know what crises are on the horizon, we stress test our portfolios by applying two market shocks: a 10% drop in the S&P 500 Index and a 100-basis point rise in the U.S. 10-year Treasury Bond. Each of the hypothetical scenarios combines shocks to a variety of markets and is based on how these various markets would likely become embroiled in the event. So capturing the risk for these two stressors is more than simply a matter of taking our exposure to the S&P 500 and the U.S. Treasury, respectively, and multiplying these exposures by the shock we are hypothesizing.

Our public equity positions drop essentially one-to-one with the shock to the S&P 500. For the Treasury shock, we lose 3.4% in our fixed income positions because when rates rise, bond prices drop. However, we more than make up for that loss through the effect of the rate increase on our equities.

We are exposed to the three scenarios we consider here, most notably to an increase in market volatility and a Chinese credit crunch, which will lead to a drop in our equity positions in the 8% to 9% range. A repeat of the 2013 "Taper Tantrum" shock hits both our equity and fixed income positions. A large Federal Reserve balance sheet unwind could spark a similar episode.

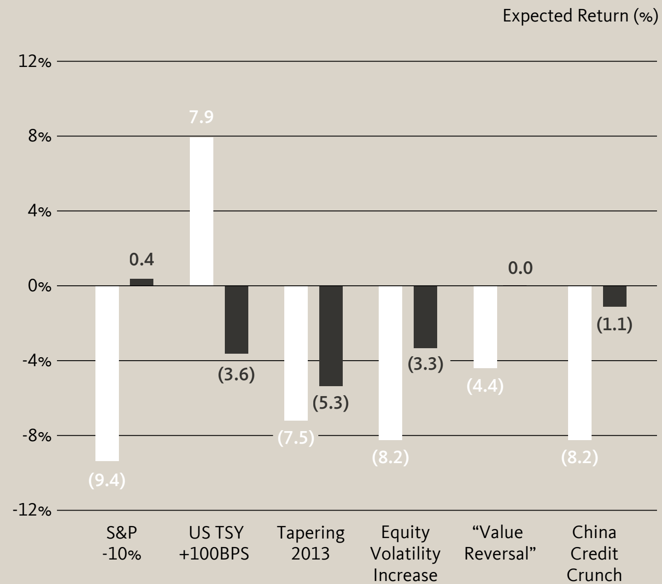
Risk 2.0
Endowment

- Public Equity
- Fixed Income



Risk 2.0
Pension

- Public Equity
- Fixed Income



Risk 3.0: What Happens Next?

Though Risk 2.0 gives us more risk guidance than 1.0, it still doesn't get us where we want to be. The issue, as we all know from the financial crisis of 2008, is that one problem leads to the next, with cascading — and sometimes snowballing — dynamics that can embroil the market. The initial shock is never the end of the story.

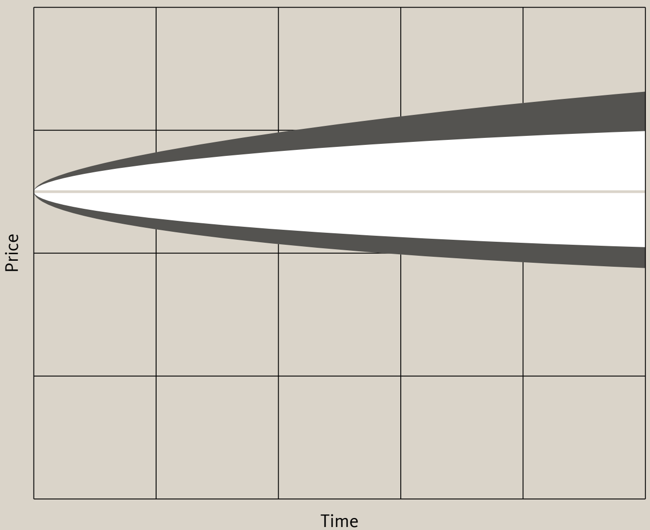
And the plot of the story is often intricate and unpredictable. For example, a market drop will force those who are leveraged to sell. Their selling pushes prices down further. They can't sell in a market that is under pressure, so they start to sell other assets in their portfolio, which creates contagion. With the prices dropping and volatility increasing, potential buyers pull back and funding dries up. The result can be a "fat tail" risk, a risk that emerges down the road from the initial shock as these various dynamics gather speed. History-based Risk 1.0 cannot pick up on these dynamics. They occur infrequently, and each time they are different. So the standard 1.0 depiction of risk is that it grows symmetrically and smoothly over time.

So to really deal with risk, we have to capture and understand this dynamic, which is what Risk 3.0 is built to do. The foundation of Risk 3.0 is a method called Agent-based modeling. This approach seeks to capture the dynamic evolution of financial market contagion. Agent-based models have been used for years in other fields, to understand the emergence of traffic congestion on the roadway, for example, or of panics and stampedes during fires. If it sounds like this type of modeling should carry through to the essence of crisis behavior in the financial sector, you're right. And by comparing the implications of following through with the dynamics of various market stresses with the shock test results from Risk 2.0, we get a more complete picture of what we're facing and how we can best react.

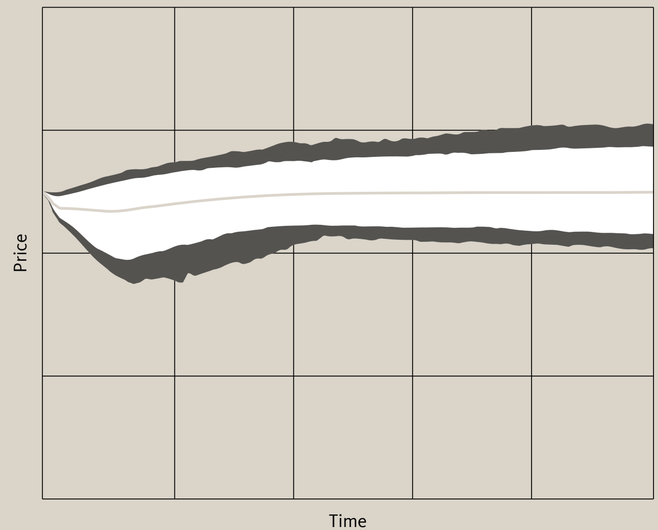
We are on the leading edge of Risk 3.0 in the industry, developing the models and data sources needed to manage our risk in this revolutionary way. This involves crowdsourcing data and surveying the various financial market agents to understand the leverage, liquidity and concentration that each of these agents hold and the rippling effects they may cause. Though we still are in what might be called the Beta version of Risk 3.0, we believe it will allow us to steel ourselves against the next crisis. Or maybe even profit from it.

Risk 1.0
Bands

The risk bands show the likely range of prices as we move forward in time. Prices will be in the white area 90% of the time and in the wider area covered by both the white and dark bands 95% of the time. The standard methods of Risk 1.0 assume a smooth, symmetric path for prices, whereas Risk 3.0 recognizes that during periods of market dislocation there can be periods of marked "tail" risk, and that risks will not always be symmetric.



Risk 3.0
Bands



**Risk 3.0 Case Study:
A low-volatility environment**

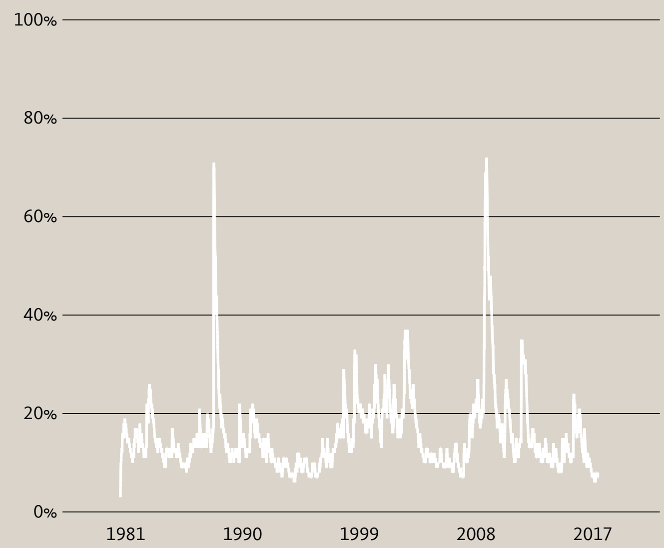
Volatility is currently at or near its lowest levels in over 20 years for many asset classes. Paradoxically, a sustained period of low volatility breeds increasing risk because life seems easy; investors are more willing to take on leverage, market makers are more ready to provide liquidity and funding is easier to come by. Complacency comes into question.

If we look at our exposure to a rise in volatility through the simplest lens, that of Risk 1.0, it appears risk is minimal. We don't have option exposure, so a mechanical calculation of the change in the value of our positions with a change in volatility will come out to be close to zero.

But when we go to Risk 2.0 and take into account the broader scenario of asset markets that tend to be affected by a rise in volatility, we find our exposure is not insignificant. Extending the Risk 2.0 scenario beyond public equities and fixed income to include our other asset classes — using both BlackRock and internal methodologies — we calculate a loss from a sudden 20% rise in equity volatility as measured by the index to be 5.8% in GEP and 6.1% in UCRP.

That, however, would not be the end of the story. If we move to Risk 3.0, we consider the cascades and contagion that will come from the dynamics and feedback. For example, those with high leverage and those who are targeting a predetermined level of volatility would be forced to trim their portfolios, and those invested in volatility-related Exchange-Traded Funds (ETFs) would react to large declines in the value of these instruments. We would expect after these rippling effects for losses to be larger than they would appear if we stopped with Risk 1.0 or 2.0.

Volatility
S&P 500



Managing risk the UC way.

Culture: Speaking the Same Language

An essential part of risk management is having a common, shared view of risks and working together to find common risks wherever they may lurk within the portfolio. For example, there will be equity risk in both public equities and real assets; there will be inflation risk in fixed income, but also in real estate.

In order to understand the components of risk that thread across the various asset classes, we augment the standard, asset-based risk approach with one using risk factors. We use macroeconomic factors that look at the essential components of risk that are endemic to the financial landscape: economic growth, real rates, inflation, credit, emerging markets, commodities and foreign exchange. We then determine the exposure of each asset class to these factors and sum across the exposure to get a measure of our overall portfolio factor risk.

What is remarkable, but actually not unexpected, is that economic growth is the dominant factor for both GEP and UCRP, as it is for most other pensions and endowments; it makes up 79% of our risk for GEP and 85% for UCRP. Economic growth is the naturally dominating factor for equities, but is also prominent in everything from real estate and real assets to private equity, reaching into all of the asset classes.

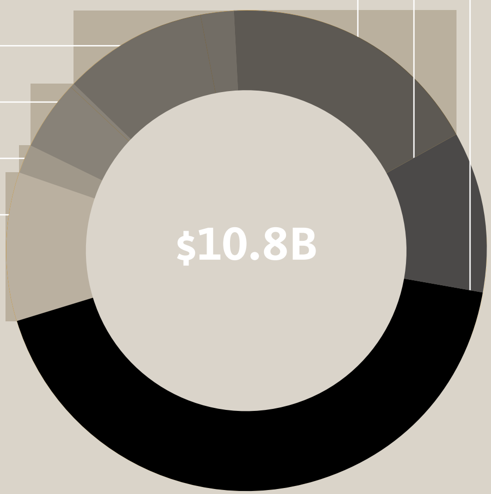
Of course, not all of our risk is explained by the factors mentioned above, or for that matter, any other set of factors. The “residual” indicates the risks that remain unexplained and will include asset-specific, idiosyncratic risks.

Risk Factors

Economic Growth	Proxied by broad, developed market equity index returns
Real Rates	Inflation-linked bond returns
Inflation	Return of long nominal bonds, short inflation-linked bonds portfolio
Credit	Return of long corporate bonds, short nominal bonds portfolio
Commodity	Weighted Goldman Sachs Commodity Index returns
Emerging Markets	Equally weighted basket of emerging market assets

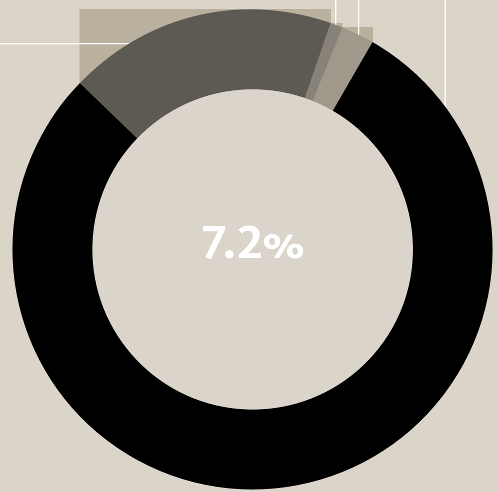
Endowment
Asset Allocation

Public Equity	43%
Fixed Income	11%
Absolute Return	18%
Private Equity	12%
Real Estate	4%
Real Assets	2%
Cash	10%



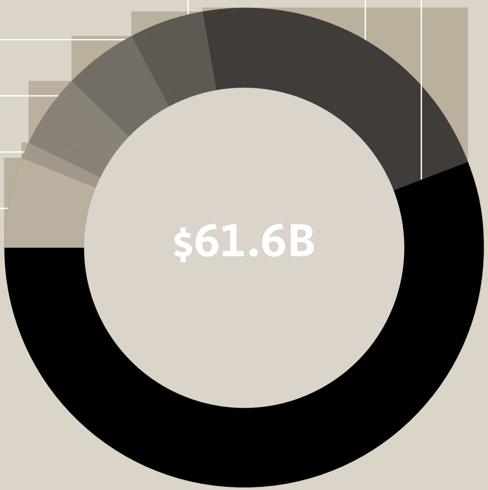
Endowment
Risk Allocation

Economic Growth	79%
Foreign Exchange	2%
Emerging Markets	1%
Residual	18%



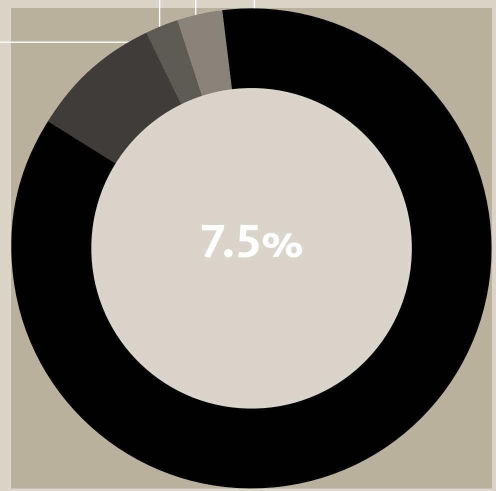
Pension
Asset Allocation

Public Equity	56%
Fixed Income	22%
Absolute Return	5%
Private Equity	5%
Real Estate	5%
Real Assets	1%
Cash	6%



Pension
Risk Allocation

Economic Growth	85%
Foreign Exchange	3%
Emerging Markets	2%
Residual	10%



Process: From teams to product managers and back

The process that takes us from measuring risk to managing risk involves all of the teams at UC Investments. We verify the data used for risk measurement, assess the reasonableness of the resulting reported risk, and then start the iterative process. We start with the desks that oversee the various asset classes and then involve the product managers who have front-line responsibility for integrating performance and risk for GEP, UCRP and Working Capital and need to look at these in tandem.

A member of our risk team works with each desk to certify that the position data coming into the risk system is correct. Once the risk reports are generated, the results are reviewed with the desks to make sure everyone is on the same page. Because the markets are dynamic with new strategies, events and instruments, the review is also an opportunity to uncover other dimensions of risk that need to be monitored.

Once the final risk report is generated, it is reviewed by the product managers and we have further discussion of new and emerging risks before the report is finalized and presented to the CIO.

Integration: Opportunity & Risk

The twin edges of the sword for investment decisions are opportunity and risk, or the expected returns and the volatility of returns. Once the risk is verified and shared, the task is to tie it to these decisions.

Often risk management is treated as an add-on to investments, sometimes even as a control function akin to accounting and audit. In that role, the risk team throws the risk numbers over the cubicle, and they land on the portfolio managers' desks without any context.

At UC, we believe the key to effective risk management is to overcome this tendency and have all of our investment professionals share the same understanding of risk. Each team member looks at risk in the context of our total portfolio, rather than only their own, and then integrates risk into the investment discussion.

It's a robust process. Back-and-forth with the desks and product managers. On-the-ground views of the markets that inform us of emerging risks. Assessing the position integrity going into the risk reports and risk measures coming out as well as the use of common factors that thread risk exposures across all of the positions.

The bottom line: We can play better defense by trimming exposure to the markets that will be affected, perhaps only secondarily as collateral damage. And we can move to a posture of greater liquidity, not only as a defensive posture, but to keep powder dry to enter the market opportunistically as a dislocation runs its course.

All of this is in service of one goal: Making sure we're in alignment with one of our key investment beliefs and pillars: Everyone is a risk manager. Risk rules.

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