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The Evolution of Asset Classes: Lessons from University Endowments

By John M. Mulvey, PhD, and Margaret Holen, PhD

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THE EVOLUTION OF ASSET CLASSES

Lessons from University Endowments

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Abstract

This paper surveys the practice of asset allocation for larger U.S. university endowments focusing on asset category definitions. Wide diversity today reflects the broad shift to alternative investments and the blurring of boundaries by investment funds and managers. A prominent example involves hedge funds. Numerous and divergent subcategories depict the current wide-ranging opportunities available. We point out the movement to define asset categories with reference to their target performance or underlying return drivers rather than traditional investment vehicle-types, and we speculate on future directions and implications for the role of strategic asset allocation for institutional investors.

Introduction

Asset allocation generally is accepted as a central tenet of sound money management for institutional investors. However, the role of strategic asset allocation and its implementation have been evolving over the past decade and longer. This evolution is exemplified in the way that larger U.S. university endowments manage their capital.

College and university endowments have been heralded as innovators. Noticeably, these investors have made a significant shift to alternative assets, especially private equity and hedge funds (Swensen 2000, 2009). In 2014, the average endowment portfolio was 51 percent alternatives, up from 23 percent in 2000; table 1 shows that endowments with more than $1 billion in assets have even higher allocations to alternatives, which average 57 percent (Griswold 2015). Many endowments have enviable historical performance records. Accordingly, other institutional investors have gained interest in the so-called endowment model. In conjunction with this trend to alternative investments, U.S. university endowments have been on the forefront of modifications to the definitions of the underlying asset categories. At one time, there were three or four major categories: equities, bonds, cash, and (sometimes) real estate. Today, the situation has changed dramatically.

In this paper, we survey the asset categories and allocations employed by the larger U.S. endowments as reported in publicly available reports. The survey reveals a great diversity in the definition of asset categories. This diversity reflects the need to develop workable solutions for addressing the blurring of traditional boundaries by investment funds, such as liquid alternatives products, and by an increasing focus on underlying return drivers.

Table 1: Asset Allocation for U.S. Colleges and Universities (2014)

Asset Class	Survey Average	Endowments over $1 billion
Equities	36%	31%
Domestic equities	17%	13%
International equities	19%	18%
Fixed income	9%	8%
Alternatives	51%	57%
Short-term securities/cash/other	4%	4%

Source: NACUBO (2015)

Likewise, many endowments frame asset category choices in terms of their own teams and investment processes as they seek to generate returns in a competitive landscape with scrutiny from broad and sophisticated constituencies.

The endowment model, especially for investors outside the university domain, has attracted criticism about governance, fees, and incentives, concerns that have been cited in policy discussions on public pension funds and helped motivate the U.S. Department of Labor's Fiduciary Rule (OECD 2015, Pew 2014, Parisian and Bhatti 2015). Practical problems include evaluating the efficiency of active management fees for portfolios highly correlated to liquid indexes and understanding exposures to underlying factors such as oil prices that can affect portfolios through multiple channels, including direct exposures to futures or physical assets, public equity, and private equity. It is natural to look to the universities that led the trend into alternatives for insights into navigating the resulting complexities.

The endowment model emphasizes manager selection and opportunistic investing over the top-down decision-making incorporated into asset allocations (Monk 2014). Common reasons include the high dispersion of returns among alternative investment funds, the stickier nature of manager relationships in partnership structures, and less-liquid longer-term underlying investments. In a study of endowment returns from 1984 to 2005, Brown et al. (2010) find evidence that endowments overweight asset categories wherein they can source stronger managers. Endowments themselves often make this point in self-reports.

In contrast, asset categories play a central role for many investors. They provide the framework for governance and oversight through

asset allocations and also scaffold the entire investment process (see sidebar). Strategic asset allocation depends upon assumptions about anticipated returns, co-movements, and risk at the category level. For many institutions, the category in which an investment sits can determine its selection and monitoring process. In this paper, we focus on the first step of the investment management process, defining asset categories and benchmarks, through the lens of U.S. university endowments.

Asset categories serve multiple goals within a strategic asset allocation process. First, an asset category should represent a significant, clearly defined segment of the investment universe. Second, for diversification purposes, asset categories should have performances that are relatively uncorrelated to each other. Third, ideally, a category should have a well-specified benchmark so the manager selection and other tactical decisions can be made in a relatively systematic manner. Fourth, the risk-adjusted returns of a category should be positive over long time periods. Investors are paid to accept risks; they should be aware of the underlying risk factors embedded in an asset category. Fifth, a category should be within the ability of the investor to understand and invest in. Many financial experts and organizations such as the CFA Institute (2013) emphasize these essential features when selecting an appropriate set of asset categories. Our endowment report survey provides ample evidence of asset categories serving these goals for university investors in diverse ways.

Survey of University Endowment Self-Reports

We reviewed public disclosures for the endowments ranked as the largest respondents to the National Association of College and University Business Officers (NACUBO) Survey (NACUBO 2015). The relevant information is available on university websites located through commonly available search engines. We found fifty institutions among the largest seventy-two endowments that disclose asset allocations in the context of performance and strategy discussions (see table 2).[1] From these universities, we collected public materials available to us, such as asset categories and investment policy statements.[2]

Unlike most private investors, who in the absence of requirements choose not to disclose information publicly, universities publish reports on their endowment investing activities, giving direct insight into current practices. These reports reflect incentive to inform and rally the confidence of donors, although, like other investors, endowments attend to their proprietary interests to "keep the secret of the secret sauce," including specific manager relationships, selection processes, and tactical investment themes (Cassar et al. 2016).[3] Reports often retain the same language from year to year, so parts can seem like boilerplate, but comparing reports across a wide sample reveals notable and interesting variations.[4] Within our survey, self-reports provide a unique window on influential portfolios and their underlying investment processes, in particular identifying alternative approaches to categorizing assets.

TRADITIONAL INVESTMENT MANAGEMENT PROCESS

1. Define asset categories and benchmarks.
2. Conduct strategic asset allocation and asset-liability studies to set investment guidelines and target allocation levels.
3. Select investments, including funds and internal or external manager mandates, and implement.
4. Monitor and report on the portfolio in the context of the broader markets, including performance attribution, concentration risks, and diversification benefits. Revise managers (both active and passive).
5. Periodically assess current conditions and consider tactical drifts from strategic targets, as may be allowed by guidelines.

Table 2: Summary of University and College Endowment Asset Allocation Reports

Total Number of Endowment Reports	50
Total AUM of Endowments	$302 billion
Largest Endowment (Harvard University)	$36 billion
Smallest Endowment (University of Delaware)	$1.3 billion
Average AUM	$5.2 billion
Median AUM	$2.5 billion
Number over $10 billion	4
Number over $5 billion	13
Average Number of Asset Categories per Endowment*	7.3
AUM-Weighted Average	8.6

* Fourteen endowments in our survey develop asset allocation for a hierarchy with two or three levels of aggregation. We use the term "asset category" to describe the lowest level in the hierarchy and the term "aggregations" to describe the higher levels.

In our analysis, we segmented the endowments into three groups. We found that twenty-nine institutions, or 58 percent of our sample by count making up 56 percent of the total assets, follow a common paradigm in reporting—which we call the current norm. This group uses five core categories: public equity, private equity, real assets, absolute return, and fixed income. The second group of fourteen endowments, or 28 percent of our sample, provides more granularity, e.g., separating long/short hedge funds from other strategies. A third overlapping set of six (12 percent) employ novel groupings based on anticipated performance behavior, with categories such as growth, inflation, excess return, and diversifying.[5]

In contrast to our survey, NACUBO reports more widespread use of categories outside the current norm. Common categories noted by NACUBO include growth assets, risk-reduction, and inflation protection, as well as opportunistic and liquidity. Why aren't innovative categories more commonly featured in the public reports we surveyed? Investors may use multiple categories in their investment processes even if only one is chosen for governance and/or

disclosure purposes. Indeed, several reports discuss multiple approaches when portfolio allocations are specified through a singular lens.[6] For example, the Harvard endowment recently introduced factor-based approaches to determine its allocation framework, although it publishes a mostly traditional report (Harvard 2015).[7] Our review includes examples of nearly all the categories featured in NACUBO's survey with lower frequency. Thus, innovations mentioned in public disclosure seem to be more widely deployed than those disclosures alone would indicate.

The most complete public reports share insights into how innovative asset categories support robust investment processes. In particular, the University of California, Berkeley Foundation endowment and the University of Virginia Foundation offer extensive, engaging discussions connecting asset categories with the investment processes.

Survey Results: The Current Norm

The majority of the larger endowments follow a common paradigm with five core asset categories[8]: public equity, private equity, real assets, absolute return, and fixed income. Within this paradigm, nomenclature varies. There are twenty-one different names for public equity categories, mostly benign variations and geographic distinctions. In contrast, none give geographic breakdowns for private equity, though some separate buyout and venture, and only a few give geographic breakouts for fixed income.

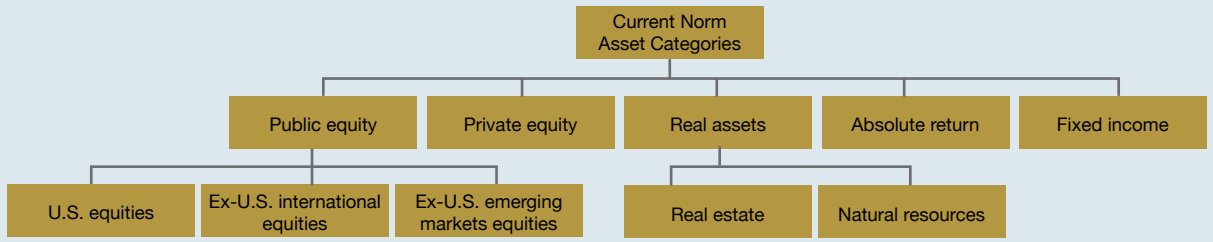
Within the current norm, the absolute return category features the most consistent nomenclature and is rarely subdivided. The term "absolute return" appears in just more than one-third of those using the common paradigm; "hedge funds" and "marketable alternatives" were the next most common. Subdivisions appear in other categories—private equity split into venture versus buyout, fixed income split into credit versus government bonds or rates, and so on. Aligning these five categories with those of the NACUBO survey shown in table 1, allocations roughly align (see figure 1 and appendix A).

Stanford and Princeton: Typical Frameworks, Allocations, and Investment Discussions

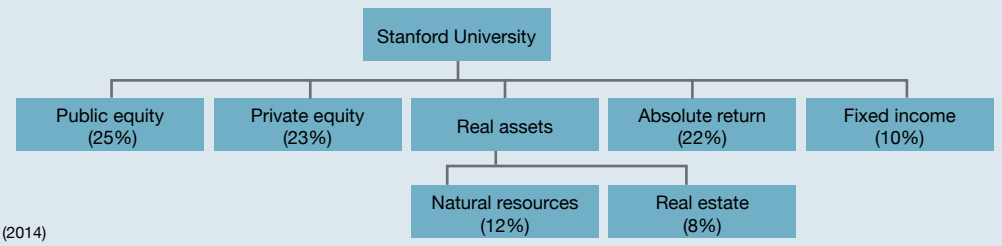
Stanford and Princeton provide representative examples of the current norm asset categories. These endowments publish relatively

Figure 1: A Typical Current Norm Asset Allocation Framework

(A) Typical Current Norm Asset Allocation Framework

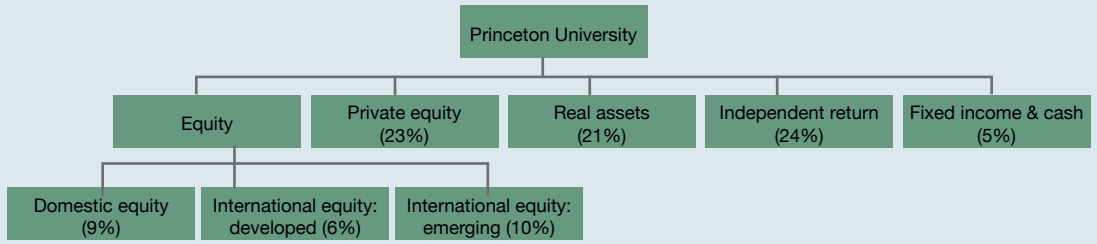


(B) Stanford University Asset Allocation (June 30, 2014)



Source: Stanford (2014)

(C) Princeton University Asset Allocation (June 30, 2014)



Source: Princeton (2014)

extensive discussions of investment processes and returns. Both were relatively large in 2014, $23 billion and $21 billion, respectively, and are managed by external companies (Stanford Management Company [SMC] and Princeton University Investment Company [Princo]). Their reports reflect five themes that are common to many in our sample:

1. An equity orientation in asset allocation driven by the need for long-term growth and inflation exposure to service organizational needs.
   - Princeton (2014, p. 17): "Readily manifest [in the asset allocation] is Princo's bias towards equities or equity-like assets—95 percent of the portfolio is allocated toward these investments." As noted above, the bias toward equity is echoed by many endowment reports. Notably, the 95-percent allocation quoted by Princo includes the "independent return" allocation.[9]

2. An emphasis on excellent third-party managers as a critically important element.[10]
   - Stanford (2014, p. 1): "Stanford University's brand and SMC's reputation as a stable long-term source of capital enable SMC to gain access to the best third-party managers in the world."

3. Diversification as a key means of mitigating risk, with minimal elaboration and caveats about the relative importance of qualitative judgments.
   - Stanford (2014, p. 1): "The ... portfolio is constructed on a foundation of modern portfolio theory and strategic asset allocation. ... SMC also seeks to add value through effective risk management, tactical portfolio rebalancing and opportunistic investment tilts."

4. A focus on less efficient markets where return premiums can be achieved, often with specific reference to private markets and remarks that the long-term investing horizon of the endowment is well-suited to that opportunity set.
   - Princeton (2014, p. 19): "The 'Grand Unifying Theme' [of non-U.S. local managers], while very important, is not fully visible in the policy portfolio as it cuts across several asset categories." Princeton indicates that its asset allocation includes emphasis on global/ex-U.S. investments across its asset categories, though it shows geographic breakouts only for public equity.

5. A corresponding overlay of liquidity considerations with separately monitored targets.
   - Princeton (2014, p. 18): "The endowment [has a] finite tolerance for illiquidity, and [we had] a view that we could better use "illiquidity units" by shifting allocation from Real Assets to Private Equity [because] Private Equity's roster is broader and deeper (paralleling a richer set of prospective managers) and provides better opportunities to deploy capital with managers who can generate very high absolute returns." This provides a particular example of two trends: the primacy of manager choice over strategic asset allocation and the separate monitoring of liquidity across asset categories.

Similar statements from other endowments appear in appendix B.

Asset Category Innovations: Incremental Granularity

Among a significant number of endowments, we observe a positive trend toward granularity especially in the absolute return and natural resources categories.

Incremental granularity: hedge funds. Despite the diversity of strategies within the absolute return bucket, relatively few institutions provide further granularity. Indeed, there seems to be debate about the premise of the category. Yale describes core holdings in its absolute return bucket as long/short equity strategies (event-

Table 3: Institutions Subdividing Absolute Return/Hedge Fund Categories

Institution	Number of Categories	Equity-Related Hedge Fund Category	Other Categories
Georgia Institute of Technology	2	Long/short equity	Multi-strategy hedge funds
Williams College	2	Global long/short equity	Absolute return
University of Illinois Foundation	2	Marketable strategies: hedged equity	Marketable strategies: credit/absolute return/distressed
University of North Carolina at Chapel Hill	2	Long/short equity	Diversifying strategies
University of California	3	Opportunistic equity	Absolute return strategies, cross-asset class strategy
University of Texas System	6	Developed-country equity, emerging markets	Credit-related fixed income, investment-grade fixed income, real estate, natural resources
University of Washington	2	Capital appreciation: opportunistic	Capital preservation: absolute return
Pennsylvania State University	3	Hedged strategies: equity related	Hedged strategies: credit-related hedged strategies: other
The Ohio State University	2	Long/short equity	Relative value/macro, credit funds
University of Virginia	2	Long/short equity	Marketable alternatives and credit

and value-driven hedged strategies) (Yale 2014). In contrast, Harvard states, "Unlike many investors, this [absolute return] portfolio does not include equity long/short managers, and we do not view this as a levered bet on equities" (Harvard 2014). Dartmouth's approach is more aligned with Yale's, with a single hedge-fund-like category called marketable alternative equity with a stated objective to "[g]enerate equity-like returns with reduced volatility" (Dartmouth 2014). This diversity of practice makes further granularity and clarity in absolute return categories an especially promising innovation. Ten endowments in our survey specify granularity by separating long/short equity strategies from other absolute return strategies (table 3). This may reflect long/short fund investments expected to have a relatively high correlation with public equity markets.

Incremental granularity: natural resources. Six endowments in our survey include subcategories under natural resources or real assets, generally separating private and public investments (table 4). Two of these endowments, Georgia Institute of Technology and Duke, include public equities with a natural resources link in the natural resources category rather than in equity categories, presumably, reflecting assumptions that the returns of some industry sectors will exhibit persistently distinctive behavior from broader equity markets.[11]

Functional Categories and Aggregations

In our survey, the most noteworthy innovation entails clustering investments in a different fashion, with single categories that span divisions in the current norm and instead focus on common underlying return drivers or expected risk/return profiles. We present these innovations in the context of individual endowments with reports that exemplify them.

Broader categories for equities and commodities (Duke)

Duke University[12] combines two of its five investment types thematically and presents its portfolio allocations with three innovations (Duke 2014, 2016):

- a single equity category that combines public and private;
- a commodities category that spans traditional boundaries, including commodity-related equities as well as private investments in energy, power, infrastructure, and timber, typical investments in the natural resources category; and
- no category for hedge funds, absolute or independent return (these securities may be included in other categories).

Many others mirror Duke's single category spanning public and private equity, but Duke's commodities category is unique among our sample.[13] Given the past decades of run-up and -down in commodities markets, this attention may appeal to investors seeking to understand the impact of a commodity or inflation factor on investment returns. Duke's other categories (see figure 2) are more consistent with the current norm, though fixed-income is divided more granularly with rates and credit separated.[14]

Novel functional categories (UC Berkeley)

Further diverging from the current norm, the UC Berkeley Foundation and several others identify asset categories based on

Table 4: Granular Natural Real Assets/Natural Resources Categories

Institution	Number of Categories	Aggregation	Underlying Category or Description
Georgia Institute of Technology	4	N/A	Real estate (3%)
			Natural resource equities (5%)
			Energy & timber (5%)
			Commodities (2%)
Washington University in St. Louis	2	N/A	Private real assets (8%)
			Public real assets (3%)
The Texas A&M University System	2	N/A	Private real estate & hard assets (8%)
			Public real estate & commodities (8%)
Harvard University	3	Real assets (25%)	Public commodities (2%)
			Natural resources (13%)
			Real estate (10%
Pennsylvania State University	4	Real return (12%)	Real estate (3%)
			Natural resources (3%)
			Commodities (4%)
			TIPS (2%)
Duke University*	1	Commodities (13%)	Direct commodity exposure, commodity-related equities, private investments in energy, power, infrastructure, and timber

*Duke does not provide incremental granularity, but its novel commodity category is a helpful contrast.

the anticipated performance of securities within these categories.[15] Berkeley specifies four broad categories (table 5).

Notably, each of Berkeley's categories deliberately encompasses multiple investment types that offer similar risk and correlation profiles. The category definitions allow for the inclusion of hedge funds, along with other similarly targeted investments, in multiple segments of the portfolio. Table 6 highlights examples of subcategories that comingle hedge funds within or across higher-level categories or aggregations. Four subcategories involve groupings that combine traditional fixed income and hedge fund investments.[16]

Berkeley provides an unusual degree of elaboration about its novel approach to asset category definition and how this approach supports its overall investment process (BEMCO 2014a, 2014c). In particular, it describes how its asset categories mesh with its investing team's organizational structure, with generalists working across traditional boundaries to target opportunities fitting specific risk/reward criteria.

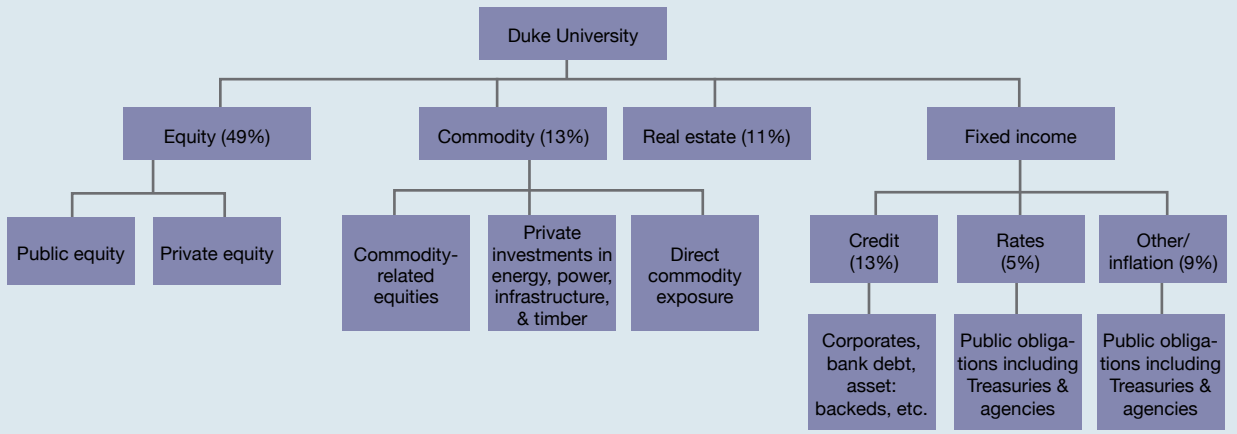
Novel factor-inspired categories (UVA and others)

The University of Virginia (UVA) provides a typical example of category segmentation with three distinctive components (UVIMCO 2014, 2015):

- Growth, or equities, with investments spanning public equities, long/short equity strategies, and private equity, intended to provide a core source of long-term return.
- Inflation, or real assets, along with inflation-linked fixed income instruments such as Treasury inflation-protected securities (TIPS), intended to perform well in inflationary environments offsetting the impact of fixed income.
- Defensive, liquidity, or fixed income, often including credit or macro/relative value hedge fund strategies, intended as a stable core of the portfolio.

Table 7 compares UVA with four other endowments that follow this three-prong structure, Cornell University, The Ohio State University, University of Iowa, and University of Florida, along

Figure 2: Duke's Target Asset Allocation and Asset Category Descriptions (June 30, 2014)



Source: Duke (2014)

Table 5: University of California, Berkeley, Asset Allocation (June 30, 2014)

Asset Category	Thematic Description	Investments Included	Allocation
Equities	Assets that are heavily tied to equity markets and expected to generate equity-like returns and volatility	Long-only and directional long/short strategies	37.5%
Excess return	Assets that are intended to meaningfully outperform equity markets over the long-term with less emphasis on interim volatility or liquidity	Private equity, venture capital, higher volatility/less correlated real asset strategies, other	25.0%
Diversifying	Assets that are intended to generate equity-like returns but with less correlation to or volatility than equity markets	Absolute return, lower volatility/less correlated real asset strategies, other	27.5%
Defensive	Assets that are intended to preserve their value and liquidity across a variety of markets	Treasuries, cash, and other lower volatility/less correlated strategies	10.0%

Source: BEMCO (2014a, 2014b)

Table 6: Aggregations/Higher-Level Categories Containing Hedge Fund Strategies

Institution	Aggregation/Higher-Level Category Name	Hedge Fund Strategy Included	Other Investments Included
UC Berkeley	Global equities	Directional long/short strategies	Long equities
	Diversifying assets	Absolute return, lower volatility/ less correlated real asset strategies	None
	Excess return	Higher volatility/less correlated real asset strategies	Private equity
	Defensive	Lower volatility/less correlated strategies	Fixed income
University of Washington	Capital appreciation	Opportunistic	Public equity, private equity, real assets
	Capital preservation	Absolute return	Fixed income
The Ohio State University	Global equities	Long/short equity	Public equity, private equity
	Fixed income	Relative value/macro, credit funds	Fixed income, private credit
University of Virginia	Equity	Long/short equity	Public equity, private equity
	Fixed income, cash and marketable alternatives and credit	Marketable alternatives and credit	Government bonds, cash, and currency
University of Iowa	Volatility-reducing assets	Diversifying equity	Fixed income
University of Florida	Growth	Hedged strategies	Public equity, private equity
Pennsylvania State University	Diversifying	Hedged strategies: Equity-related	None
		Hedged strategies: Credit-related	
		Hedged strategies: Other	

with a public pension example, the Teacher Retirement System of Texas, commonly known as Texas Teachers (TRS 2014a, 2014b).[17]

The University of Virginia has perhaps the most fulsome discussion in our survey.[18] It echoes many others in emphasizing partnerships with successful managers as a cornerstone of its success,[19] yet it offers a detailed discussion of the rationale for its asset categories and provides more insight than most on other aspects of its investment process. For example, the report notes a common underlying driver for both public and private equity returns: "Equity investments provide an opportunity to participate in the growth of public and private companies. In a growing global economy with low inflation, these investments historically have provided the highest long-term return opportunities" (UVIMCO 2014, p. 9).

The UVA performance discussion in UVIMCO (2014) further underlines common features of markets and managers that drive both categories:

- "Bullish public markets, favorable conditions for initial public offerings (IPOs), and strong merger and acquisition activity provided fertile ground for equity returns in both the public and private arenas" (p. 15).
- "[L]ong-term outperformance in both public and private equity reveals the exemplary security selection and value-added capabilities of our external managers" (p. 16).

UVA specifically addresses the role of long/short managers, noting an expectation of correlated returns with a lower risk:

- "We do not expect our long/short equity investments to outperform our other equity investments over time. Rather, the objective for our long/short equity program is to generate returns that are less risky than our long-only public equity and private equity programs, while affording the opportunity to make money from shorting stocks" (UVIMCO 2014, p. 16).

Another novel aspect is the inclusion of marketable alternatives and credit in the same policy allocation as fixed income, to "provide protection in deflationary or weak economic environments" (UVIMCO 2014, p. 9).

UVIMCO's report also underlines that the endowment focuses its portfolio within subsets of the investable universe where its team has developed domain expertise as well as an established network of manager relationships. This approach is not viable for the largest investors such as massive pension plans, but other investors should consider these policies as an important lesson—perhaps a significant under-recognized feature of the endowment model.

Conclusions: Where Are We Headed?

Several trends stand out in our survey of large university endowments. First, there is no universal approach for slicing the investment universe. As we have seen, diversity rules.

What has led to this divergence from the original set of major assets—stocks, bonds, cash, and real estate? In our view, several causes are obvious. First, university endowments have been leaders in the shift to alternative investment categories, especially private

Table 7: Examples of Functional Categories and Aggregations with Three Components

Institution	Growth Grouping	Inflation Grouping	Defensive Grouping
Cornell University	**Equity – 61%** No further detail provided	**Real assets – 20%** No further detail provided	**Defensive – 20%** No further detail provided
The Ohio State University	**Global equities – 61%** Public equities – 43% Long equities – 28% Long/short equities – 15% Private equities – 17% Buyout/growth – 7% Natural resources – 7% FoF/secondaries – 2% Venture capital – 1%	**Real assets – 9%** Real estate – 5% Infrastructure – 4%	**Global fixed income – 30%** Fixed income – 8% Credit funds – 11% Relative value/macro – 7% Private credit 4%
University of Florida	**Growth – 80%** Public equities Hedged strategies Private equities	**Inflation – 12.5%** Natural resources Real estate	**Liquidity – 7.5%** Fixed income, cash
University of Iowa	**Growth assets – 52%** Public equity – 40% U.S. – 9% Global – 25% Emerging markets – 6% Private equity – 13%	**Inflation-sensitive assets – 10%** Real estate/natural resources – 10%	**Volatility-reducing assets – 38%** Diversifying equity – 24% Fixed income – 14%
University of Virginia	**Equity – 65%** Public equity – 22% Long/short equity – 23% Private equity – 20%	**Real assets – 13%** Real estate – 8% Resources – 5%	**Fixed income, cash, and marketable alternatives and credit – 22%** Marketable alternatives and credit – 11% Government bonds –8% Cash and currency – 3%
Texas Teachers	**Global equity – 61%** U.S. large cap – 18% U.S. small cap – 2% Non-U.S. developed markets – 15% Emerging markets – 10% Directional hedge funds – 5% Private equity – 11%	**Real return – 21%** Global inflation-linked bonds – 5% Real assets – 13% Energy and natural resources – 3% Commodities* - 0%	**Stable value – 18%** U.S. Treasuries – 13% Absolute return* – 0% Stable value hedge funds – 4% Cash – 1%

* Note: Commodities and absolute return categories were included with zero target allocation but small actual allocations, commodities 0.1 percent and absolute return 1.6 percent.

equity, real assets, and hedge funds. These private investments, by their nature, are wide-ranging in the use of sophisticated investment vehicles, structures, and strategies, and as a result it is difficult to characterize the underlying instruments. A prime example is the area of commodities. Investing in commodities can be accomplished in a variety of manners, such as futures contracts, outright purchases of the commodity itself (or the land holding the commodity), equity markets that directly link to commodities, or even via commodity-based hedge funds. Each of these subcategories will perform differently in many economic environments. Endowments make idiosyncratic choices to include or to exclude specific types of investments among this broad universe—and define their asset categories accordingly.

Second, many modern investment types and vehicles blend attributes across traditional category boundaries. Take the case of a private fund of senior credit debt instruments. These investments combine elements of fixed income (regular cash payments), private equity (capital tied up for five to seven-plus years), credit risks (counterparty difficulties), levered securities, and the risk of capital contributions under adverse circumstances. Where should these innovative products be placed? Facing these issues, endowments have chosen alternative solutions with varying asset-category definitions.

Another step in the evolution of asset allocation is the broad adoption of factor approaches to identify drivers of performance. For instance, the UVA endowment notes common factors within its combined private and public equity category. The private debt fund mentioned above might have equity, bond, and even currency factor exposure, as might more typical high-yield bond portfolios. The Harvard endowment (Blyth et al. 2016) employs factor-based methods in an attempt to unravel the complexity of the current investment universe. Other large institutional investors are working on similar concepts (e.g., Ang 2014).

A related approach is to segregate investments by their anticipated performance characteristics. The Berkeley endowment has chosen

this route. As discussed above, hedge funds might appear in any of Berkeley's four major asset categories—equities, excess returns, diversifying, and defensive, depending on the strategy of the fund. A potential advantage of this categorization is the facilitation of ex-post performance attribution relative to ex-ante assumptions. Did the fund or private deal live up to its initial promise? On the other hand, benchmarking and performance attribution may become more complicated under this unusual breakout.

In the end, we applaud the wide-ranging approaches taken to defining asset categories by university endowments. We expect that some of these experiments will be conspicuous successes and lead to emulation by other investors, some may be applicable to a small number of specific universities, and others may prove problematic and transient. Future research in this domain will help speed up the progression.

Amid a rapid rise in the range of investment alternatives and struggles to find associated paradigms for governance and oversight, large university endowments provide a reference point for best practices. Surveying public disclosures complements the broad approach of direct surveys like that of NACUBO. Self-reports lack full transparency and leave much unstated, but investors seeking to emulate the success of endowments will find useful insights. In particular, endowment self-reports provide templates for reinvigorating traditional asset categories, key elements of investment processes and reporting alike. ●

John M. Mulvey, PhD, is a professor of operations research and financial engineering and a founding member of the Bendheim Center for Finance at Princeton University. Contact him at mulvey@princeton.edu.

Margaret Holen, PhD, is a private investor and retired partner of Goldman Sachs, where she held leadership positions in the Strategies Group responsible for analytics in the firm's revenue divisions. She continues to serve as a member of the GS Foundation Investment Committee.

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Endnotes

1. In research conducted in the third and fourth quarters of 2015, we focused on reports for the fiscal year ending in 2014, which were the most recent and widely available at that time. We included reports from neighboring time periods when 2014 data was unavailable. The fifty reports found were among the largest seventy endowments. We excluded endowment information provided in audited financial statements of portfolio holdings absent supporting materials.
2. In a few cases, institutions list differing asset categories and allocations across different publications. In these cases, our summary tables and statistics note the asset allocation from the annual report.
3. See also, e.g., *Financial Times* January 25, 2016, "Richest U.S. Universities Reel in Donors," http://on.ft.com/1Upv4DT.
4. "Readers of previous Annual Report letters may observe that [the strategy section] of the annual letter has remained consistent—and will again this year. This is because as a long-term investor our investment strategy remains relatively constant while our implementation is flexible in order to take advantage of capital market opportunities" (UTIMCO 2014).
5. We found three endowments that did not fit neatly within the dominant norm or novel trends. Two of these indicate broad categories for "alternatives" (Indiana University Foundation and University of Kansas Endowment). The third has categories aligned with the dominant norm but with "inflation hedge" and "deflation hedge" in place of "real assets" and "fixed income" (University of Oklahoma Foundation), without supporting discussion.
6. For example, Princeton discusses an aggregate equity category covering public, private, direct, and absolute return. Harvard shows breakouts of private equity by geographic region in its performance discussion, granularity it excludes in its asset allocation specification.
7. The Harvard report that discusses the new framework is from the 2015 year-end; the allocation included in our survey was from 2014.
8. Three of the five categories in this paradigm would fall into the NACUBO aggregation for alternatives. Four of the endowments, among the thirty that conform to this paradigm, include an aggregation for alternatives across private equity, real asset, and absolute return categories (University of California System, University of Illinois, Wellesley, and University of Rochester).
9. A similar grouping is used by University of Washington, which presents an aggregate capital appreciation category that aligns with Princeton's equity aggregation. UC Berkeley groups all but its defensive categories together under a theme of "risk assets."
10. Though the importance of excellent third-party managers is broadly emphasized by the reports in our survey, few provide any insight into the selection process.
11. It is unclear from the public reports if the institutions include all commodities-related equities in this combined category, or, if they do, what adjustments are made to their equity category benchmarks to reflect that.
12. Duke's $7-billion endowment is managed by a stand-alone firm, Duke University Management Company, known as DUMAC, which manages Duke's assets along with those of a few associated institutions. Duke reports on its endowment in a separate dedicated publication, "Duke University's Endowment Snapshot," which at two pages is substantially more compact than Stanford or Princeton's (Duke 2014). DUMAC also provides a relatively terse web page titled "Risk Management" (Duke 2016) that highlights the benefits of diversification and the portfolio's high Sharpe ratio (1.12 vs. 0.38 for its benchmark over a twenty-five-year period).
13. Like Duke, Harvard presents an equity aggregation that includes public and private along with a commodities category, though the latter consists solely of direct exposures and was being phased out of the portfolio.
14. This is a common breakdown. For example, the NACUBO–Commonfund survey (NACUBO 2015) separates core fixed income from distressed debt/high yield.
15. UC Berkeley, technically the endowment of the University of California, Berkeley Foundation, provides an unusual degree of disclosure. It publishes an annual report and its investment policy document along with a separate policy overview document that it describes as a "supporting narrative" for its investment process (BEMCO 2014a, 2014b, 2014c). Like other institutions discussed here, it has a dedicated management company, though Berkeley's endowment is significantly smaller, at $1.5 billion as of June 30, 2014, and has had a modest return history.
16. Though its asset categories are defined broadly, Berkeley's annual report notes that its holdings in the defensive bucket consist exclusively of bonds and cash (BEMCO 2014a). They also set and justify a benchmark portfolio: 83.5 percent global equities and 17.5 percent treasury bonds.
17. Another example with some resemblance to this paradigm is Pennsylvania State University. It presents four aggregates: growth combines private and public equity; inflation spans TIPS, commodities, natural resources, and real estate (like Texas Teachers); defensive contains only nominal bonds; and diversifying contains a single hedge fund category (Pennsylvania State University 2014).
18. UVA's foundation endowment, with $6.9 billion, is managed by a dedicated company, the University of Virginia Investment Management Company, or UVIMCO. UVIMCO reports on endowment management in a twenty-page annual publication, with roughly fourteen pages devoted to separate chapters on investment strategy, investment policy, risk management, and investment performance. It is among the most extensive and substantive discussions in our sample. UVIMCO's 2015 report includes a page on operational due diligence and its 2014 report features an interview with the chief financial officer.
19. In the words of UVIMCO's Chief Executive Officer Larry Kochard, the organization's "core competency [is] selecting exceptional managers" (UVIMCO 2015).

Appendix A: Table of Endowments Following the Current Norm

Count	Institution	Assets (million)	Total # of Categories*	Equity	Private Equity	Real Assets	Absolute Return	Fixed Income
1	Yale University	$23,900	8	2	1	2	1	1
2	Stanford University	$21,446	6	1	1	2	1	1
3	Princeton University	$20,996	7	3	1	1	1	1
4	University of Notre Dame	$9,810	5	1	1	1	1	1
5	University of Michigan	$9,731	8	1	2	2	1	1
6	Northwestern University	$9,704	8	2	1	1	1	1
7	University of Pennsylvania	$9,582	8	3	1	2	1	1
8	University of Chicago	$7,546	8	1	2	2	1	1
9	Emory University	$6,681	6	1	1	1	1	1
10	Rice University	$5,528	7	1	1	2	2	1
11	Dartmouth College	$4,468	6	2	1	2	–	1
12	Vanderbilt University	$4,086	7	1	1	2	1	1
13	New York University	$3,500	4	1	–	1	1	1
14	Michigan State University	$2,545	7	3	1	1	1	1
15	University of Wisconsin	$2,319	5	1	1	1	–	1
16	California Institute of Technology	$2,270	7	2	1	1	1	1
17	Amherst College	$2,149	4	1	–	1	1	1
18	Boston College	$2,131	6	2	1	1	1	1
19	University of Rochester	$2,100	6	1	1	1	1	1
20	University of Minnesota	$1,900	5	1	1	1	1	1
21	Wellesley College	$1,834	6	2	1	1	1	1
22	Carnegie Mellon University	$1,800	9	3	1	1	1	1
23	Smith College	$1,756	5	1	1	–	1	1
24	University of California, Los Angeles	$1,733	7	1	1	2	1	1
25	Tufts University	$1,590	4	1	–	1	1	1
26	Southern Methodist University	$1,466	6	1	1	1	1	1
27	Georgetown University	$1,461	4	1	–	1	1	1
28	Case Western Reserve University	$1,381	5	1	1	1	1	1
29	University of Delaware	$1,310	4	1	1	–	1	1
	Total AUM, Avg # of Categories	**$166,723**	**5.9**	**1.4**	**0.9**	**1.2**	**0.9**	**1.0**
		Avg Allocation		**39%**	**18%**	**13%**	**20%**	**9%**
		Avg Allocation ($-wgtd)		**31%**	**22%**	**17%**	**20%**	**8%**

* Note: Included in the total number of categories but excluded from the detailed columns: Thirteen have separate cash categories (Yale, Michigan, Northwestern, University of Chicago, Emory, Vanderbilt, Wisconsin, Caltech, Rochester, Carnegie Mellon, Smith, UCLA, Southern Methodist). Additionally, three categories extend from the norm: University of Chicago includes "inflation protection," Carnegie Mellon includes "other," and Rice includes "opportunistic."

Appendix B: Themes from Investment Discussions

Quotes from institutions illustrating broad themes noted in the Stanford and Princeton disclosures:

- Dartmouth (2014, p. 5): "Dartmouth's portfolio reflects a commitment to bottom-up manager selection and maintains an awareness of risk and return characteristics at the portfolio level."
- Rice (2014): "Manager selection is essential to outperforming and Rice seeks to partner with the best investment managers in each asset class."
- University of Notre Dame (2015): "[Our] long-standing investment philosophy is anchored in three core principles: diversification, partnering with the highest quality managers in each asset class, and liquidity."

- University of Pennsylvania (2015, p. 2): "The evolution of [University of Pennsylvania]'s asset allocation towards a stronger equity orientation, greater diversification, and more inefficient markets has been steady over time."
- Carnegie Mellon (2014, p. 11): "Within the last 10 years, the university's long-term strategic allocation strategy shifted from one based on traditional, publicly held investments to one focused on allocation to nontraditional or alternative investments, such as private equity, hedge funds and private real asset funds."
- Yale (2014, p. 1): "Because investment management involves as much art as science, qualitative considerations play an extremely important role in portfolio decisions. The definition of an asset class is quite subjective, requiring precise distinctions where none exist. Returns, risks, and correlations are difficult to forecast."
- Wellesley College (2014, p. 12): "The Investment Committee and Investment Office team regularly review the expectations upon which the Policy Portfolio is based, with the goal of refining target allocations in order to improve the portfolio's risk/return characteristics."

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IMCA®
INTERNATIONAL

5619 DTC Parkway, Suite 500
Greenwood Village, CO 80111
Phone: +1 303-770-3377
Fax: +1 303-770-1812
www.IMCA.org

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