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Harvard Management Company (2010)

In February 2010, Jane Mendillo gazed out of her 16th-floor office window at a cold Boston Harbor and reflected on the set of issues facing Harvard Management Company (HMC). Since her return to HMC as CEO in July 2008, Mendillo had successfully managed the endowment through the worst financial markets crisis in a generation. But that period had brought to the fore multiple issues facing Harvard's endowment, and she wanted the lessons from the crisis to inform the decisions at the HMC board's next meeting. The board members would soon be reviewing its policy portfolio along with the current positioning of the endowment. They were eager for an update on a variety of related issues, highlighted during the crisis, such as the allocation of the endowment between internal and external managers, the illiquidity of much of the endowment, the effectiveness of HMC's risk controls, and coordination with the university regarding its liquidity needs and risk tolerance.

The Role of the Endowment

Harvard University had been founded in 1636, and from the beginning its endowment played an important role in the financial structure of the institution. As of June 2009, the endowment totaled $25 billion. Each school within the university owned units in the endowment, much like an individual would own shares in a mutual fund, and received distributions from the endowment ("spending") in proportion to the units it owned. Aggregate endowment spending represented 38% of the university's budget and varied widely across the schools, ranging from 15% for the School of Public Health to 87% for Radcliffe. In fiscal year 2009, endowment spending totaled $1.4 billion, or 4.1% of the value of the fund at the end of the previous fiscal year.

Within its decentralized financial and budgeting system, colloquially referred to as "every tub on its own bottom," Harvard sought to manage its endowment spending to provide relatively predictable cash distributions to the individual schools. Historical endowment spending is shown in **Exhibit 1**. The Harvard Corporation (the university's operational governing body) determined the spending rate each year according to the overall financial situation of the university and the collective needs of its individual schools, but balanced against the desire to maintain the endowment's long-term purchasing power. Given that the spending rate was targeted to stay within 3%–6%, annual returns on the endowment had a significant impact on the annual increases in total spending. In recent history, these annual increases had been as small as 3% and as large as 29%.

Professors André Perold and Erik Stafford prepared this case. It represents an update of the case "Harvard Management Company (2001)," HBS No. 201-129, written by Professor Jay Light. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

The general objective was to preserve the real value of the endowment (adjusted for Harvard's expense growth) and its income distribution in perpetuity. If, for example, in the long run the endowment was able to earn a 5.5% real return, annual gifts to the university continued to average about 1.5%, and Harvard expenses continued to grow at the higher education price inflation (HEPI)[1] rate, then the university could spend a maximum of 6% of the endowment annually. However, given the uncertainty associated with future real returns and gifts, it was prudent to set the annual spending rate closer to 5%. In the short run, of course, the inflation rate and financial market returns could fluctuate widely, as could the expected needs of the institution. In the 1970s, for example, when inflation was rampant and financial markets had not performed well, the payout ratio was increased but spending increases were still generally smaller than inflation. This put significant pressure on the schools' operating budgets. Conversely, in the latter part of the 1990s, when financial markets rose dramatically, spending as a percentage of the endowment's market value declined for a period until several years of substantial spending increases restored the payout ratio to the target range. In the last several decades, spending as a percent of endowment value had been as high as 5.8% and as low as 3.3%, averaging 4.4%.

While Harvard's endowment was considerable (in fact, the largest in the United States), the institution, like all other universities, was not without its financial concerns. A 30-year-long contraction of federal support for education and research, rising faculty salaries, increasing needs of student financial aid, the need to maintain and renovate an aging physical plant, and the desire to restrain tuition increases so as to keep a quality education within reach of middle-income Americans were a set of financial pressures to which no American university, including Harvard, was immune. In addition, plans had been made involving significant new investments in capital projects, especially in Allston, where Harvard was planning a major expansion of its campus. But the market impact of the crisis in 2008–2009 had led to significant belt-tightening across the university, and these longer-term plans were put on hold while the Harvard Corporation worked on prioritizing initiatives.

The asset allocation of the endowment thus needed to be importantly connected to the more general ongoing discussions of the university's financial condition. If a new asset allocation policy could yield greater expected long-run returns from the endowment, it might support greater spending rates and contribute substantially to alleviating current financial pressures (for example, by allowing smaller tuition increases and/or greater faculty salaries). However, such an allocation would inevitably come with more risk, and risk appetites were understandably cautious, given the steep losses of the previous year.

HMC's Organization

HMC was founded in 1974 to provide management for Harvard's endowment, pension assets, working capital, and trusts. HMC currently employed about 180 people, including 40 investment professionals, and had an annual operating budget of $67 million. An organization chart is shown as **Exhibit 2**.

The History of the Asset Mix

Before 1990, the endowment's asset allocation was fairly simple—primarily a mix of U.S. stocks and bonds with small allocations to foreign markets and alternative assets such as private equity and real estate. It had a smaller weighting in U.S. and foreign stocks, relative to comparable institutions, and a larger weighting in cash and private investments. Under Jack Meyer, the CEO of HMC from

[1]HEPI had historically averaged about 1% over the consumer price index (CPI).

1990 to 2005, Harvard began an extended set of analyses and discussions with various constituencies of the university about return goals, risk tolerance, and the concept of a policy portfolio that would serve as a target for long-term allocation of assets. Meyer believed that a policy portfolio should be based on long-term return and risk assumptions, not short-term forecasts of market sentiment. The policy portfolio was the portfolio that Harvard should hold under "neutral" conditions, when managers had no idea which way the stock market would move, what would happen to interest rates, or which classes of securities were cheap or dear.

The policy portfolio also served as a performance benchmark. Its performance was calculated using the returns on index benchmarks for the underlying asset classes—referred to as *beta*. The return that the endowment produced in excess of the policy portfolio benchmark, or *alpha*, represented the value added (or subtracted) of active management.

The original policy portfolio had been reviewed annually by the board since 1992, and had been expanded to include additional asset classes and modified over time. **Exhibit 3** shows the policy portfolio in 1992 and its evolution since then. **Exhibit 4** shows the policy portfolio as of July 2009 for fiscal 2010, along with the performance benchmarks for each asset class.

The Hybrid Model

Unlike most universities, which relied on external management for 95%–100% of their endowments, Harvard used a hybrid model. In July 2009, 33% of the endowment was managed by investment professionals working internally at HMC, while 64% was invested with various external managers. Both kinds of managers sought to generate alpha. (The remaining 3% was in cash.)

The externally managed portion had grown considerably over time, as shown in **Exhibit 5**. A prime cause of this shift was manager spinouts. A number of HMC's internal managers and their teams had left over the years to form their own firms, and in almost all cases they continued to manage significant assets for HMC post-spinout, albeit with advantageous fee arrangements for Harvard. Most of those spinouts went on to become highly successful hedge funds or private investment firms.

In 2010, internally managed assets comprised primarily publicly traded instruments. (The exception was the natural resources portfolio composed of long-term direct investments in timber and agricultural land selected and controlled by investment professionals employed within HMC.) Internally managed assets were allocated by asset class into different portfolios, each run by a team headed by a senior portfolio manager. In general, the managers tended to be quantitatively oriented, opportunistic, price-sensitive investors. They maintained contact with and received ideas and trade suggestions from a wide variety of market participants located throughout the world. They were individually responsible for developing ideas and structuring a portfolio in their own domain (e.g., emerging market equities) but were more recently also encouraged to work together and challenge, test, critique, and enhance one another's ideas.

The specific alpha-generation techniques varied across asset classes and portfolio managers, but there was a common investment theme of finding two or more related assets mispriced relative to one another, then buying the cheap asset, selling the expensive asset, and eliminating as much ancillary risk as possible, the objective being to produce excess returns that had little to no correlation with underlying market returns. If portfolio managers could act on a particularly interesting "arbitrage" idea in size, they would not be averse to substantial long and short positions to capture the potential of a small mispricing in a big way. Harvard's AAA credit rating often allowed them to accomplish this more effectively than other investors could. Not only were HMC managers able to

finance large positions, but HMC was a preferred counterparty for derivative transactions, which were sometimes a key link in the overall process.

With respect to external managers, HMC had 86 relationships with firms that traded in public instruments (mostly hedge funds), in addition to a similar number of funds focused on private investments (primarily private equity and real estate). As **Exhibit 6** shows, investing in external hedge funds was a relatively recent phenomenon for HMC, with external allocations back in 1998, for example, going almost entirely to private investments. Jane Mendillo had become somewhat skeptical of the value of manager proliferation, and she questioned whether it might make more sense for Harvard to concentrate on a smaller number of the best external funds.

Mendillo had thought a lot about the benefits and complications of a hybrid internal/external model. To begin with, the hybrid model was exceptionally cost-effective. External managers typically charged base fees of 1%–2% per annum, while HMC's expenses associated with internal management (before incentive payouts) were less than a quarter of that. In addition, internal managers earned considerably lower performance-based compensation: they received a lower share of profits than the typical 20% for external managers, and they got paid only when they outperformed market benchmarks. By contrast, external managers usually received performance-related fees on returns in excess of zero. Also, some of the performance-related compensation earned by internal managers was deferred, so in the case of future losses by these managers, Harvard could claw back the previously earned but unpaid compensation. This was unusual in the world of investment management. Unfortunately, however, the compensation of the top internal managers was disclosed publicly, and it opened HMC to unfavorable press focused negatively on the costs of internal management.

External management also had issues of transparency and illiquidity. Mendillo was working with her external management team to get better transparency into the specific exposures in the portfolios of Harvard's external managers, but there was frequently less complete information on the risks inherent in externally managed portfolios than in internally managed ones. Issues of illiquidity arose from lockup periods, redemption notice periods, and the uncertainty surrounding fund term changes (especially during the crisis). Access to much of the externally invested money could be gained only over an extended period. By contrast, since the internally managed funds were mostly invested in actively traded public markets, those portfolios could be converted to cash quickly if needed. They also offered far greater transparency and control. Even the longer-term investments in timberland and agriculture land provided liquidity benefits relative to external, commingled fund investments in private equity and real estate. Direct ownership of these natural resource assets provided complete discretion over when to sell the assets, shortening the time to liquidity from five years or more to less than a year in most cases.

While the benefits of internal management could be significant, for certain asset classes and strategies it was unrealistic for HMC to hire enough people to manage all of its exposure in-house. And in cases where she saw truly exceptional talent in the world of external management, Mendillo was eager to have that talent applied to Harvard's portfolio.

Endowment Performance

Harvard measured the value added through active management of the portfolio by comparing the performance of the actual portfolio with that of the policy portfolio, a weighted average of passive market benchmarks. Harvard also measured how much value its asset allocation process (the policy portfolio) added (or subtracted) over a more traditional approach. Harvard did this by comparing the endowment's performance to the return on a portfolio that was invested 60% stocks and 40% bonds.

In addition, HMC's board sometimes wanted to compare the endowment's performance to that of other, similar investment portfolios.

Exhibit 7 shows the performance of HMC relative to a 60% stock/40% bond portfolio as well as to the Trust Universe Comparison Service (TUCS) median endowment return, while **Exhibit 8** shows the annual breakdown of the last 10 years of endowment returns compared to both the policy portfolio and the median endowment. Over the last 10 years, HMC's active management had outperformed the policy portfolio by 4.4% per year, translating into many billions of dollars of added value. Over the long term, the portfolio had soundly outperformed both a 60% stock/40% bond portfolio as well as the TUCS median, and this outperformance improved over time. The average outperformance versus the endowment median over the last 46 years, for example, was 1.8% per year, and it had been continually improving, with the outperformance being 5.8% annually over the last 10 years. This could be explained by improved alpha generation and the movement over time of the endowment into less efficient asset classes, which yielded higher returns than traditional assets.

Another factor in Harvard's performance arose from the use of leverage historically in HMC's active management of the endowment, even including a –5% allocation to cash in the policy portfolio. In the years leading up to the financial crisis of 2008, this explicit leverage had grown to 7%, and additional leverage within asset classes and leverage caused by asset class shorts brought the total leverage to approximately 20%. This added leverage was beneficial in up-markets but significantly hurt performance as the markets took a turn for the worse. Mendillo's predecessor, Rob Kaplan, who had overseen HMC as an interim CEO, had begun to reduce leverage in mid-2008, and Mendillo quickly moved to reduce it further.

Liquidity Concerns

Over the prior decades, Harvard had benefited from the high returns it was earning on its investments in illiquid asset classes, and, as shown in **Exhibit 9**, investments in illiquid assets steadily grew over time. **Exhibit 10** shows that, by June 2009, 74% of the assets would take longer than a month to liquidate, and 44% would take at least five years to be liquidated. **Exhibit 11** shows that uncalled capital commitments to private investments had reached a peak of $11 billion in 2008.

When Mendillo arrived at Harvard in 2008, she was concerned that illiquid assets were no longer priced to offer meaningful excess returns, and she became concerned that Harvard could be overexposed to these types of investments. In addition, there were increasing pressures to satisfy the cash needs of the university for its day-to-day operations. Longer-term cash needs would become even more significant, particularly if the university resumed the large expansion into Allston.

Additional liquidity pressures had recently arisen in connection with a series of large interest-rate swaps that the university had entered into in 2004. The swaps capped interest costs on future debt issuance at a certain rate, but they also created a situation in which HMC needed to post collateral on the swaps on the university's behalf whenever interest rates decreased. Mendillo discovered that there had been a lack of communication between the university and HMC with regard to financial risks—such as the ones posed by these swaps—although coordination with the university had improved significantly since then.

In the fall of 2008, illiquidity and leverage caused considerable strain for the endowment as financial markets moved down in concert and interest rates decreased (causing the collateral needs for the debt swaps to go up). Liquidity management and related risks had quickly become Mendillo's primary focus. This focus included examining the contracts HMC had in place with each external manager and analyzing the liquidity options for each fund, as well as creating regular reports that

Mendillo and the board could use to view the sources and uses of liquidity on an ongoing basis. The reports included monthly projections of capital calls and distributions related to private equity and real estate; **Exhibit 12** shows HMC's projected monthly outflows and inflows for 2010.

Mendillo sought to balance current liquidity needs against the fact that there were many illiquid investment opportunities coming out of the crisis that promised superior returns. Once the current crisis abated and the university's immediate liquidity needs were satisfied, the endowment would be in a better position to take advantage of such opportunities.

In the wake of the crisis, Mendillo had begun to ponder whether Harvard, rather than being an investor with one long-term horizon (and some short-term cash needs), had a range of horizons, some nearer-term, some medium-term, and some longer-term. Mendillo suggested to the board that the policy portfolio should perhaps reflect this spectrum of horizons. She felt that liquidity management should be no longer an adjunct to, but rather an integral part of, portfolio management alongside risk management, including the management of balance sheet leverage.

Risk Management

HMC's risk management team continually measured the risk of the portfolio under normal and stressed market conditions. Among the numerous reports they provided on a regular basis were the Top 10 Country Exposure report, shown in **Exhibit 13**, and the Value at Risk (VaR) report, shown in **Exhibit 14**, both representing risk exposures in normal circumstances.

The risk management team also measured the risk of the portfolio to losses under extreme stress environments. HMC historically evaluated the response of the portfolio to extreme environments by conducting stress tests based on the October 1987 market crash and on the dramatic widening of arbitrage spreads in the fall of 1998. Mendillo felt that a wider range of stress tests needed to be run to better understand how the portfolio might behave under unusually difficult market conditions. **Exhibit 15** summarizes the absolute and relative performance of the endowment under eight different scenarios of market stress, along with the return assumptions by asset class in each scenario.

Mendillo paid close attention to the results of these stress tests because they were designed to reveal weak points in the portfolio. If she felt that there was too high a concentration of risk associated with a particular scenario, she would seek to understand the costs and benefits of purchasing hedges or insurance to counter some of the stress to the portfolio in that scenario. Purchasing insurance rather than forcing managers to cut exposure allowed the managers to leave many of their strategies in place, while cushioning endowment losses if that scenario were to come to pass. These hedge/insurance positions were placed in a house overlay account.

Mendillo was nevertheless wary of overreliance on the accuracy of the stress reports. HMC usually did not, and could not, know the exact positions of each external manager at a given time, and the risk management team had to rely on estimates of how certain parts of the portfolio would behave in each scenario. Aggregating these lagged, infrequent, imprecise, and possibly inconsistent estimates across external and internal portfolios required a lot of subjectivity.

Asset Allocation of Comparable Institutions

As part of the preparation for the annual policy portfolio discussion, HMC collected information each year on the current asset allocation policies of four other nationally prominent research-oriented universities; this information is shown in **Exhibit 16**. Virtually all of the assets of these other universities were 100% managed by outside firms, including conventional institutional managers as

well as hedge fund and private investment managers. Compared with the average of its peers, Harvard's policy allocation to public equities was relatively high, its allocation to private equity was relatively low, and its allocation to absolute return (hedge funds) was also on the low side.[2] Mendillo questioned the relevance of these comparisons, as the definitions of asset classes and investment strategies was highly variable across institutions.

The Optimal Portfolio Allocation Study

In order to enrich the more general asset allocation discussion, the HMC staff conducted a theoretical optimal portfolio analysis. There were two essential steps. First, long-term assumptions were made about the real return (relative to the CPI), risk, and correlations of 12 asset classes. Second, an optimization algorithm would specify the "efficient frontier" of possible asset combinations, that is, the set of portfolios that would provide the maximum expected return for a given level of risk and, conversely, the minimum risk for a given level of expected return.

The capital market assumptions that were used in the analysis are shown in **Exhibit 17**. In the process of generating appropriate assumptions, the HMC staff examined both the long- and short-term historical records of each asset class in terms of risk, return, and correlation. They also talked with a number of consultants and investment management firms that specialized in this type of analysis to gain their input. Finally, they adjusted the assumptions somewhat to correspond to current market conditions and tried to ensure that the inter-asset comparisons made intuitive sense. For instance, the current real return on domestic equity was 5.75%, so foreign equity, which had exchange-rate risk in addition, would need to earn a higher return (of 6.25%), and the real return on emerging market equities would need to be even higher, at 7%, to compensate for additional risks (e.g., political risk).

Given the asset class assumptions, the optimization algorithm produced the efficient frontier shown in **Exhibit 18**. The optimizer sought to hold substantial positions in natural resources, inflation-indexed bonds, and absolute return (hedge funds). The optimizer also wanted to use a significant amount of leverage. Mendillo and the HMC staff felt that some of the optimal portfolios were too nontraditional to be acceptable. They decided to constrain the asset class exposures to within plus or minus ten percentage points of the Policy Portfolio weights to see how the optimizer would respond. **Exhibit 19** shows the results of this constrained optimization.

By constraining the optimal portfolio analysis, Mendillo and her staff were well aware that they were in effect overriding their own risk and return assumptions—estimates that the group had been thinking long and hard about, and over many years. However, the efficient frontier was quite sensitive to the relative structure of input assumptions, particularly when 12 asset classes were involved, and it was difficult for anyone to confidently prescribe assumptions about future capital market returns. On the other hand, the optimizer provided important information on how the various asset classes interacted. It could be useful in determining which way the portfolio should be tilted relative to peer institutions.

The Issues

In addition to the questions of market risk and return, there were a number of broader philosophical issues relevant to the selection of a policy portfolio. In the past decade, there had been a

[2]The term *absolute return allocation* refers to externally managed hedge funds only, ignoring some pure alpha strategies employed by internal managers, primarily in fixed income.

significant shift of assets from internal to external management. Was the current split between internal and external assets optimal? What was the right number of external funds Harvard should invest in, weighing the benefits of diversification against the higher costs and risks of monitoring a larger number of investments? With respect to liquidity, was the endowment now appropriately positioned? Should there be a liquidity benchmark in addition to the policy portfolio benchmark? With respect to overall risk posture, should the fact that endowment spending now accounted for more than a third of the total university budget (up substantially over the past two decades) influence the endowment's risk profile? Should Harvard care about its own asset allocation policies compared with those of similarly situated universities? Was the current asset mix too reliant on asset classes such as hedge funds, private equity, natural resources, and real estate, some of which might not offer the same high returns in the future as they had in the past? Indeed, were the asset class distinctions that Harvard employed still meaningful?

To prepare for a robust board discussion around these topics, Jane Mendillo had led a series of discussions with board members and colleagues, taking deeper dives into particular asset classes, analyzing exposures, decomposing leverage, and scrutinizing strategies. The questions were perhaps more difficult than they had been in many prior annual reviews, but the answers now were especially important for the economic health of the university.

Exhibit 1 Harvard University's Historical Endowment Spending

Fiscal Year	Endowment Value ($millions)[a]	Endowment Spending ($millions)[b]	Annual % Increase in Spending	Endowment Spending as a % of Endowment[c]	Endowment Spending as a % of Total Harvard Budget
1980	1,491	74	4	5.6	15
1981	1,623	77	4	5.1	14
1982	1,617	82	7	5.1	14
1983	2,307	95	15	5.8	14
1984	2,188	105	11	4.6	15
1985	2,695	111	6	5.1	14
1986	3,435	118	6	4.4	13
1987	4,018	125	6	3.6	13
1988	4,156	135	7	3.3	13
1989	4,479	149	11	3.6	13
1990	4,651	180	21	4.0	15
1991	4,646	193	7	4.2	17
1992	5,087	207	7	4.5	17
1993	5,733	225	9	4.4	17
1994	6,151	260	16	4.5	19
1995	7,002	283	9	4.6	19
1996	8,606	307	8	4.4	20
1997	10,688	332	8	3.9	21
1998	12,741	394	19	3.7	24
1999	13,882	430	9	3.4	24
2000	18,233	556	29	4.0	28
2001	17,594	615	11	3.3	28
2002	16,900	749	22	4.8	32
2003	18,589	771	3	5.1	31
2004	21,849	808	5	4.9	31
2005	25,193	855	6	4.5	31
2006	28,590	933	9	4.3	31
2007	34,252	1,044	12	4.3	33
2008	36,194	1,201	15	4.1	35
2009	25,369	1,443	20	4.1	38

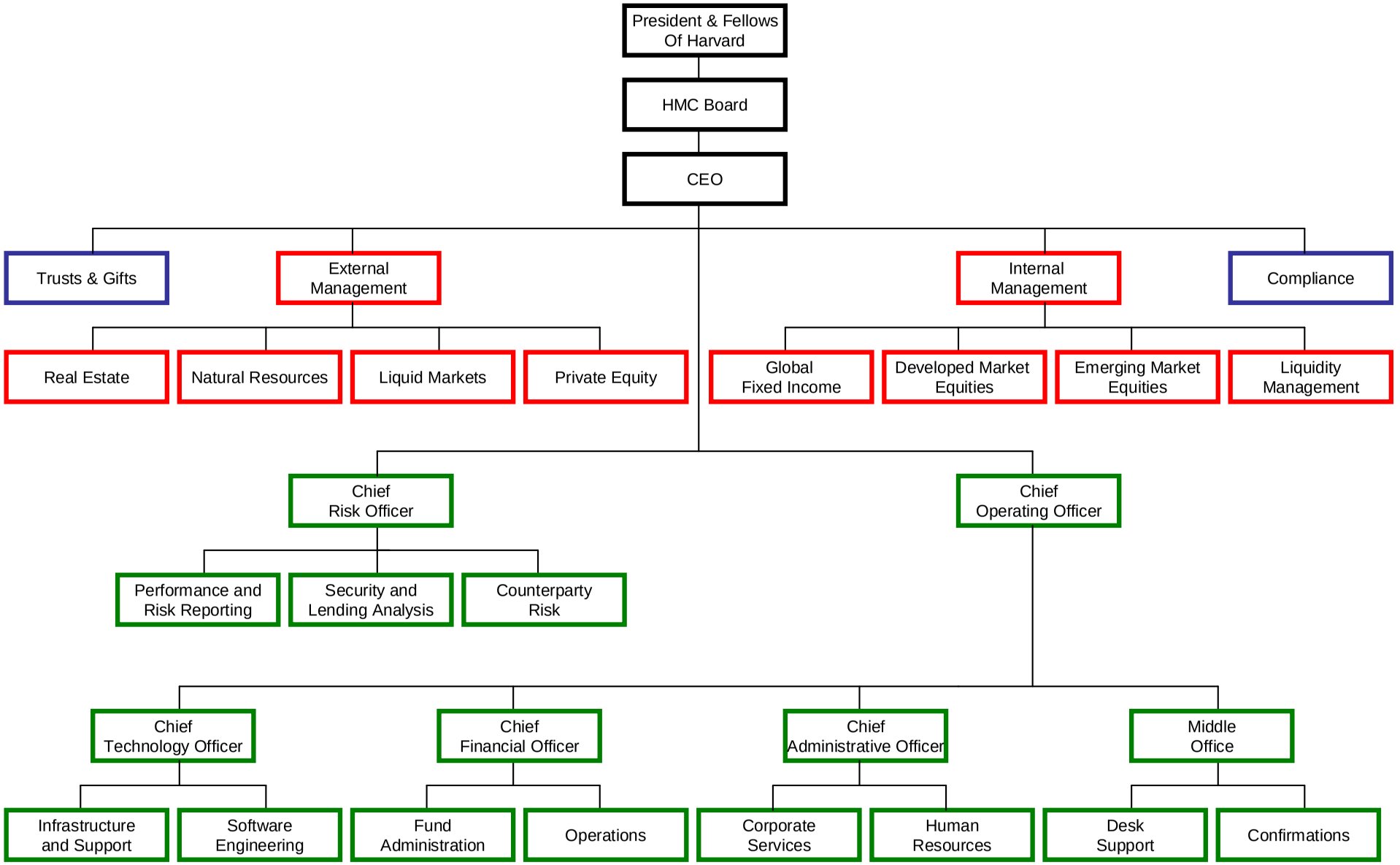
Source: Company documents.

[a]General investment account portion only.

[b]Income distributed.

[c]Calculated as a percentage of the previous year's endowment value; includes the effect of certain special income distributions.

Exhibit 2 Harvard Management Company Organization Chart (abridged)



Source: Company documents.

Exhibit 3 Harvard University's Historical Asset Mix

	1992	1996	2000	2004	2008	2010
Domestic equities	40	36	22	15	12	11
Foreign equities	18	15	15	10	12	11
Emerging markets	-	9	9	5	10	11
Private equities	12	15	15	13	11	13
Total	**70**	**75**	**61**	**43**	**45**	**46**
Absolute return[a]	-	-	5	12	18	16
High-yield	2	2	3	5	1	2
Commodities[b]	6	3	6	13	17	14
Real estate	7	7	7	10	9	9
Total	**15**	**12**	**21**	**40**	**45**	**41**
Domestic bonds	15	13	10	11	5	4
Foreign bonds	5	5	4	5	3	2
Inflation-indexed bonds	-	-	7	6	7	5
Cash	(5)	(5)	(3)	(5)	(5)	2
Total	**15**	**13**	**18**	**17**	**10**	**13**

Source: Company documents.

[a]Includes external managers whose portfolios are invested such that their performance is less sensitive to particular market indices and it can best be evaluated as an "absolute return" rather than some return relative to a market.

[b]Including both commodities and natural resources.

Exhibit 4 Harvard Management Company's Policy Portfolio and Benchmarks, Fiscal 2010

	Policy (%)	Benchmark
Domestic equities	11	86% S&P 500, 4.5% S&P 400, 9.5% Russell 2000
Foreign equities	11	MSCI EAFE Investable Market Index
Emerging markets	11	MSCI EM Index
Private equities	13	Cambridge Associates Weighted Global (+US) Composite
Total Equities	**46**	
Absolute return	16	Cambridge Associates Fund of Funds Median
High-yield bonds	2	75% Citigroup High-Yield Market Index, 25% JP Morgan GBI-EM Diversified Index
Commodities[a]	14	Weighted Average S&P GSCI Index, DJ-UBS Commodity Index, NCREIF Timberland Index
Real estate	9	NCREIF Property Index, Leverage Adjusted
Total	**41**	
Domestic bonds	4	Barclays Treasury Index
Foreign bonds	2	J.P. Morgan Non-U.S. Gov't Bond Index
Inflation-indexed bonds	5	Barclays US TIPS Index
Cash	2	One-month LIBOR
Total Fixed Income	**13**	

Source: Company documents.

[a]Including both commodities and natural resources.

Exhibit 5 Harvard Management Company, Percentage of Assets Invested with Internal and External Managers

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Internal[a]	69	61	62	74	62	62	55	49	43	38	34	33
External	26	33	36	32	46	43	43	52	61	68	73	64
Cash	5	6	2	(6)	(8)	(4)	2	(1)	(4)	(5)	(7)	3

Source: Company documents.

[a]Includes Natural Resources.

Exhibit 6 Harvard Management Company, Number of External Investments in Managers Trading Public Assets

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
6	8	10	11	15	14	18	23	35	62	86	62

Source: Company documents.

Exhibit 7 Long-Term Performance Results as of June 30, 2009 (average annual percentage returns)

Period	Harvard Endowment	60 Stock/40 Bond	Harvard Outperformance over 60/40	TUCS Median	Harvard Outperformance over TUCS
Last 46 years	10.3	8.6	1.7	8.5	1.8
Last 40 years	11.1	9.0	2.1	8.9	2.2
Last 30 years	13.0	10.2	2.8	10.1	2.9
Last 20 years	11.7	7.8	3.9	8.0	3.7
Last 10 years	8.9	1.4	7.5	3.1	5.8

Source: Company documents.

[a]Net of all fees and expenses.

[b]TUCS Median: Median performance of large funds (mostly pension funds and endowments) as measured by Trust Universe Comparison Service (TUCS).

Exhibit 8 Endowment Performance (% returns), 2000–2009

Fiscal Year	Harvard Endowment[a]	Policy Portfolio	TUCS Median[b]
2000	32.2	18.6	12.1
2001	(2.7)	(9.8)	(6.0)
2002	(0.5)	(4.5)	(5.9)
2003	12.5	8.3	4.3
2004	21.1	16.4	16.2
2005	19.2	14.2	10.5
2006	16.7	13.0	10.8
2007	23.0	17.2	17.7
2008	8.6	6.9	(4.4)
2009	(27.3)	(25.2)	(18.2)
10-year annualized rate	8.9	4.5	3.1

Source: Company documents.

[a]Net of all fees and expenses.

[b]TUCS Median: Median performance of large funds (mostly pension funds and endowments) as measured by Trust Universe Comparison Service (TUCS).

Exhibit 9 Harvard Management Company, Historical Percentage of Endowment Assets That Can Be Liquidated within Specified Time Intervals

	Days				
	0–5	**6–12**	**13–20**	**21–30**	**31+**
1995	49	18	6	2	26
1996	52	12	5	3	28
1997	57	13	3	3	25
1998	58	12	4	2	24
1999	55	10	3	1	30
2000	57	10	3	1	30
2001	64	4	0	0	31
2002	43	7	0	0	50
2003	46	5	0	0	49
2004	44	4	0	0	52
2005	36	9	1	0	55
2006	32	12	0	0	56
2007	25	2	1	0	73
2008	20	0	0	0	79

Source: Company documents.

Exhibit 10 Harvard Management Company, Percentage of Endowment Assets That Can Be Liquidated within Specified Time Intervals as of July 2009

Days					Years			
0-5	**6-30**	**31-90**	**91-180**	**181-365**	**1-2**	**2-3**	**3-5**	**5+**
24	2	1	7	6	9	4	3	44

Source: Company documents.

Exhibit 11 Harvard Management Company, Unfunded Commitments to Private Investments

Fiscal Year	Uncalled Capital ($ millions)
1998	1,189
1999	1,122
2000	1,374
2001	2,396
2002	2,736
2003	2,586
2004	3,458
2005	3,461
2006	7,218
2007	8,171
2008	11,028
2009	8,774

Source: Company documents.

Exhibit 12 Harvard Management Company, Projected Monthly Cash Inflows and Outflows for Fiscal 2010, as of June 30, 2009

	Outflows	Inflows
Jul-09	(166)	153
Aug-09	(987)	62
Sep-09	(323)	78
Oct-09	(267)	85
Nov-09	(120)	168
Dec-09	(273)	61
Jan-10	(1,037)	62
Feb-10	(143)	54
Mar-10	(319)	81
Apr-10	(79)	21
May-10	(81)	12
Jun-10	(166)	25
Total	**(3,961)**	**862**

Source: Company documents.

Exhibit 13 Harvard Management Company, Top 10 Country/Currency Exposure as of January 31, 2010 (as a percentage of endowment assets)

	Exposure
USA	50.3
Eurozone	6.9
Brazil	5.3
Japan	3.3
India	3.2
UK	2.6
New Zealand	2.6
China	2.4
Sweden	1.3
Canada	1.1

Source: Company documents.

Exhibit 14 Harvard Management Company, Absolute and Relative (to Policy Portfolio) VaR[a] of Asset Class Holdings, Expressed in Basis Points of Endowment Assets, as of January 31, 2010

	Absolute	Relative
Public Assets[b]		
Domestic Equity	72	8
Foreign Equity	59	12
Emerging Markets	64	16
Absolute Return	44	26
High-Yield Bonds	19	14
Commodities	21	0
Domestic Bonds	7	1
Foreign Bonds	5	2
Inflation-Indexed Bonds	9	2
House Overlay	9	9
Total Public	259	39
Private Assets[c]		
Private Equity	99	66
Real Estate	49	31
Natural Resources	30	33
Total Private	142	83
Total GIA	**369**	**94**

Source: Company documents.

[a]VaR: 1 week, 1.96 standard deviation move.

[b]Using daily return data for the previous 13 months, except for Absolute Return and High-Yield Bonds, for which monthly return data for the previous 3 years is used.

[c]Using quarterly return data for the previous 5 years.

Exhibit 15 Harvard Management Company, Absolute and Relative (to Policy Portfolio) Performance of Endowment under Various Market Stress Scenarios

		Deflation	Inflation	Strong Market Rally	US$ Loses Reserve Status	Stagflation	Buying Panic	Global Depression	Sep 2008 to Dec 2008
Returns on Asset Classes (%)	Domestic equities	(35)	25	40	(25)	(10.3)	58.5	(53.9)	(29.6)
	Foreign equities	(35)	25	40	(10)	(7.1)	62.5	(58.7)	(32)
	Emerging markets	(40)	30	50	(15)	(12.5)	73.3	(67.9)	(40.7)
	Private equities	(35)	15	25	(15)	(33.9)	25.1	(59.4)	(41.9)
	Absolute Return	(10)	7.5	15	(10)	(3.7)	20.6	(23.0)	(19.8)
	High Yield	(35)	0	25	(15)	(5.9)	46.2	(23.2)	(23.8)
	Commodities	(40)	40	30	20	30	25	(28)	(53.6)
	Natural Resources	(15)	10	10	5	3	8	(10)	(27)
	Real Estate	(25)	7.5	20	(5)	(23.6)	7.7	(39.8)	(30.4)
	Domestic Bonds	10	(10)	(10)	(15)	(2.9)	13.9	(5.0)	9.4
	Foreign Bonds	7.5	(7.5)	(10)	10	1.8	(3.5)	2.7	8.4
	Inflation-linked Bonds	(15)	15	7.5	(10)	20	13.3	(16.7)	(6.1)
	Cash	0	0	0	0	3.5	4	0	0
Portfolio Returns (%)	Absolute	(24.5)	14.3	22.8	(9.3)	(9.3)	30.6	(37.1)	(26.9)
	Relative (to Policy Port.)	1.3	(0.6)	(1.7)	0.9	0.2	(2.5)	2.4	1.5

Source: Company documents.

Exhibit 16 Asset Allocation of Peer Institutions: % in Various Asset Classes

	Harvard	University 1	University 2	University 3	University 4	Average of Four
Total Public Equity	33	23	25	35	28	28
Private Equity	13	25	21	12	20	20
Real Assets	26	22	29	23	20	24
Total Fixed Income	10	5	4	10	5	6
Absolute Return	18	25	21	20	27	23

Source: Company documents.

Exhibit 17 Harvard Management Company, Capital Market Assumptions: Real Return, Risk, and Correlations

	Real Return (%)	Risk [a] (%)	Correlations												
			Dom. Equity	For. Equity	Emer. Markets	Private Equity	Abs. Return	High Yield	Comm.	Nat. Res.	Real Estate	Dom. Bonds	For. Bonds	Infl - Indx.	Cash
Domestic Equity	5.75%	15.5%	1.00	0.85	0.75	0.80	0.60	0.60	0.30	0.10	0.40	0.00	0.00	0.15	0.10
Foreign Equity	6.25%	16.0%	0.85	1.00	0.80	0.65	0.60	0.60	0.35	0.15	0.40	0.00	0.20	0.10	0.10
Emerging Markets	7.00%	19.0%	0.75	0.80	1.00	0.60	0.60	0.60	0.40	0.20	0.40	(0.10)	0.00	0.00	0.00
Private Equity	6.75%	20.0%	0.80	0.65	0.60	1.00	0.60	0.60	0.15	0.10	0.20	0.00	0.10	0.10	0.10
Absolute Return	5.00%	11.0%	0.60	0.60	0.60	0.60	1.00	0.70	0.10	0.10	0.20	0.20	0.20	0.20	0.10
High-Yield	4.75%	14.0%	0.60	0.60	0.60	0.60	0.70	1.00	0.20	0.10	0.20	0.10	0.20	0.20	0.10
Commodities	4.50%	21.0%	0.30	0.35	0.40	0.15	0.10	0.20	1.00	0.10	0.00	0.10	0.10	0.40	0.00
Natural Resources	5.00%	10.0%	0.10	0.15	0.20	0.10	0.10	0.10	0.10	1.00	0.10	0.00	0.10	0.00	0.00
Real Estate	6.00%	15.0%	0.40	0.40	0.40	0.20	0.20	0.20	0.00	0.10	1.00	0.00	0.20	0.20	0.00
Domestic Bonds	1.75%	5.5%	0.00	0.00	(0.10)	0.00	0.20	0.10	0.10	0.00	0.00	1.00	0.70	0.60	0.30
Foreign Bonds	2.25%	5.8%	0.00	0.20	0.00	0.10	0.20	0.20	0.10	0.10	0.20	0.70	1.00	0.50	0.30
Inflation-Indexed	2.25%	5.1%	0.15	0.10	0.00	0.10	0.20	0.20	0.40	0.00	0.20	0.60	0.50	1.00	0.40
Cash	1.00%	3.5%	0.10	0.10	0.00	0.10	0.10	0.10	0.00	0.00	0.00	0.30	0.30	0.40	1.00

Source: Company documents.

[a]Standard deviation of returns.

Exhibit 18 Harvard Management Company Portfolio Allocation: 16 Different Portfolios along the Efficient Frontier

Risk & Return Characteristics			Allocations to Different Asset Classes (%)												
Expected Real Ret. (%)	Std. Dev. (%)	Sharpe Ratio[a]	Dom. Equity	For. Equity	Emer. Markets	Private Equity	Abs. Return	High Yield	Comm.	Nat. Res.	Real Estate	Dom. Bonds	For. Bonds	Infl - Indx.	Cash
4.5	5.90	0.59	0	0	0	3.0	18.9	0	1.5	34.1	13.1	2.0	6.6	32.2	(11.5)
4.6	6.06	0.59	0	0	0	3.1	19.5	0	1.5	35.1	13.5	1.6	6.9	33.2	(14.3)
4.7	6.22	0.60	0	0	0	3.3	20.0	0	1.5	36.0	13.9	1.1	7.1	34.2	(17.2)
4.8	6.38	0.60	0	0	0	3.4	20.6	0	1.6	36.9	14.2	0.7	7.3	35.3	(20.0)
4.9	6.54	0.60	0	0	0	3.5	21.2	0	1.6	37.9	14.6	0.3	7.6	36.3	(22.9)
5.0	6.70	0.60	0	0	0	3.7	21.8	0	1.6	38.8	15.0	0	7.7	37.3	(25.7)
5.1	6.87	0.60	0	0	0	3.9	22.3	0	1.6	39.7	15.4	0	7.7	38.1	(28.6)
5.2	7.03	0.60	0	0	0	4.0	22.8	0	1.7	40.7	15.8	0	7.7	38.9	(31.5)
5.3	7.20	0.60	0	0	0	4.2	23.4	0	1.7	41.6	16.2	0	7.7	39.7	(34.5)
5.4	7.37	0.60	0	0	0	4.3	23.9	0	1.7	42.5	16.5	0	7.7	40.6	(37.4)
5.5	7.53	0.60	0	0	0	4.5	24.5	0	1.8	43.5	16.9	0	7.7	41.4	(40.3)
5.6	7.70	0.60	0	0	0	4.7	25.0	0	1.8	44.4	17.3	0	7.7	42.2	(43.2)
5.7	7.87	0.60	0	0	0	4.8	25.6	0	1.8	45.4	17.7	0	7.7	43.1	(46.1)
5.8	8.04	0.60	0	0	0	5.0	26.1	0	1.9	46.3	18.1	0	7.7	43.9	(49.0)
5.9	8.21	0.60	0	0	0	5.2	26.9	0	2.1	47.3	18.8	0	6.9	42.8	(50.0)
6.0	8.39	0.60	0	0	0	5.3	27.7	0	2.5	48.4	19.7	0	5.7	40.7	(50.0)

[a]Sharpe Efficiency Ratio = (Expected Return – Return on cash) / (Standard Deviation).

	Constraints (%)		
	Lower	Upper	Policy
Domestic Equity	0	100	11
Foreign Equity	0	100	11
Emerging Markets	0	100	11
Private Equity	0	100	13
Absolute Return	0	100	16
High-Yield	0	100	2
Commodities	0	100	5
Natural Resources	0	100	9
Real Estate	0	100	9
Domestic Bonds	0	100	4
Foreign Bonds	0	100	2
Inflation-Indexed	0	100	5
Cash	(50)	100	2

Source: Company documents.

Exhibit 19 Harvard Management Company Portfolio Allocation: 8 Different Portfolios along the Efficient Frontier, but Constrained near the Current Policy Portfolio

Risk & Return Characteristics			Allocations to Different Asset Classes (%)												
Expected Real Ret. (%)	Std. Dev. (%)	Sharpe Ratio[a]	Dom. Equity	For. Equity	Emer. Markets	Private Equity	Abs. Return	High Yield	Comm.	Nat. Res.	Real Estate	Dom. Bonds	For. Bonds	Infl - Indx.	Cash
4.6	6.38	0.56	1	1.0	1.0	5.3	26	(5.3)	5.2	19	19	8.9	12.0	15.0	(8)
4.8	6.81	0.56	1	1.6	1.0	7.5	26	(4.1)	6.1	19	19	3.9	12.0	15.0	(8)
5.0	7.29	0.55	1	3.4	1.7	8.7	26	(3.8)	6.5	19	19	(0.6)	12.0	15.0	(8)
5.2	7.80	0.54	1	5.0	2.7	9.9	26	(3.6)	6.9	19	19	(4.9)	12.0	15.0	(8)
5.4	8.35	0.53	1	6.9	4.4	11.4	26	(4.6)	6.7	19	19	(6.0)	9.2	15.0	(8)
5.6	8.93	0.52	1	9.0	5.4	12.7	26	(4.6)	7.1	19	19	(6.0)	6.0	13.4	(8)
5.8	9.53	0.50	1	10.9	6.4	14.1	26	(4.5)	7.6	19	19	(6.0)	3.9	10.5	(8)
6.0	10.15	0.49	1	12.9	7.4	15.4	26	(4.3)	8.2	19	19	(6.0)	1.9	7.6	(8)

[a]Sharpe Efficiency Ratio = (Expected Return – Return on cash) / (Standard Deviation)

	Constraints (%)		
	Lower	Upper	Policy
Domestic Equity	1	21	11
Foreign Equity	1	21	11
Emerging Markets	1	21	11
Private Equity	3	23	13
Absolute Return	6	26	16
High-Yield	(8)	12	2
Commodities	(5)	15	5
Natural Resources	(1)	19	9
Real Estate	(1)	19	9
Domestic Bonds	(6)	14	4
Foreign Bonds	(8)	12	2
Inflation-Indexed	(5)	15	5
Cash	(8)	12	2

Source: Company documents.