Insights at Work

Evaluating Spending Policies in a Low-Return Environment

Many institutional investors are concerned that a low-return environment is ahead, forcing stakeholders to reevaluate the prudence of their investment and spending policies. We present a framework to assess spending policies, and also analyze two prominent spending models across a variety of short-term and long-term metrics. The results suggest that return-sensitivity is an important factor to consider. We also confirm that a downshift in spending may be sensible for some institutions, and offer one method to evolve a spending paradigm in a gradual and sustainable way.

TIAA Endowment & Philanthropic Services

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Introduction

Managing an endowment for both intergenerational equity and short-term support presents inherent complexities. Recent financial markets have further complicated this tension, as many organizations consider the implications of lower portfolio growth in the future. While some organizations have incorporated lower return expectations into forecasts, many of these institutions have found it difficult to reduce and align their spending targets in a commensurate way. In fact, according to the 2016 National Association of College and University Business Officers (NACUBO) study of endowment performance, most institutions have increased endowment spending despite lower returns.[1] Simply put, this dynamic could endanger the long-term viability of some of these institutions and represents one of the biggest concerns to many stakeholders in today's institutional world.

This low-return environment has ushered in a renewed focus on spending policies (of which there are many different types). A clearly defined and thoughtfully applied spending rule is a critical key to managing an endowment in these uncertain times. As has always been the case, a sustainable policy balances the contending objectives of providing a consistent flow of income to the operating budget and safeguarding the real value of the endowment over time. With concern about a future characterized by compressed returns, institutions should focus on spending policies that provide better predictability around spending and intergenerational equity.

We focus this paper's analysis on two of the most prominent policies in use today. The first is the most common payout methodology, using the moving average (MA) model. The second is the "snake in the tunnel" (SIT) model, a formula used by a smaller (but growing) number of institutions. We evaluate both policies along a variety of year-over-year and longer-term metrics. Our research has led us to encourage institutions to consider some permutation of the SIT model because it seems advantageous in both key areas of promoting payout stability from one year to the next and fostering superior endowment growth over the long term. Our analysis also leads us to believe that a spending policy based on the SIT model may be less sensitive to equity returns, hence a more robust spending policy in the sustained low-return environment anticipated by many.

The Moving Average Payout Method

Market-value-based spending policies are the most commonly used type of spending formula by endowments today. The most prevalent version of this spending orientation is to calculate the actual payout based on a moving average, typically over three years. As compared with using one data point or the endowment's current value to calculate annual spending, the MA paradigm helps smooth the volatility of distributions year-over-year and insulate spending variations during an acute market event.

We first focus our research on the MA calculation to understand its sensitivity to the chosen payout rate across a variety of characteristics. We run a model for a hypothetical $100 70% equities/30% bonds policy portfolio with 1% alpha[2] that incorporates the traditional 3-year MA spending model. Using simulations (Appendix 1), we evaluate the outputs of 15,000 iterations across a 30-year time horizon to draw interesting aggregated and time-series statistics for this spending paradigm.

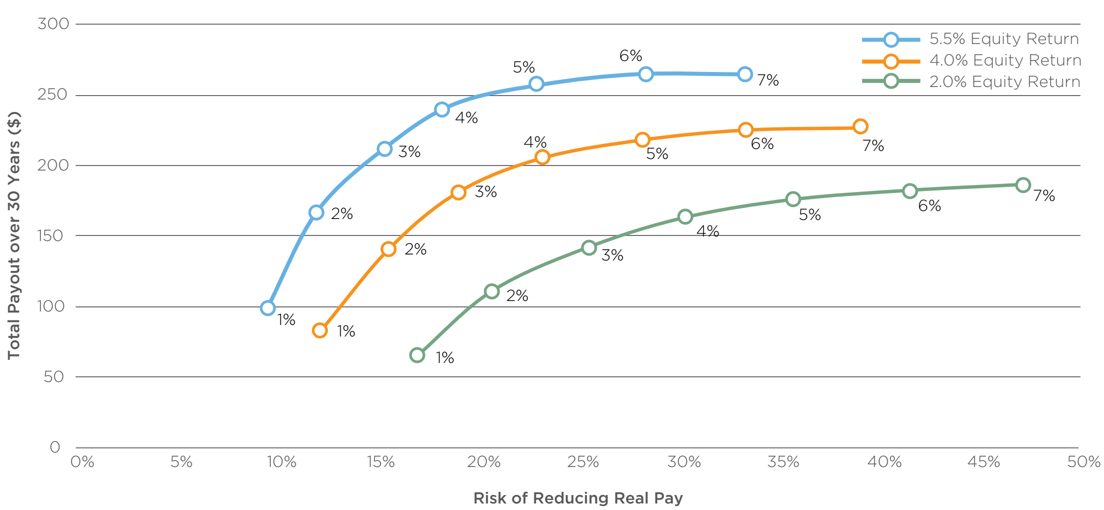
Table 1: The Impact of Different Payout Rates on the Moving Average Model

% of 3-Year Moving Average	Nominal Terminal NAV at Year 30 ($)	Total Pay over 30 years ($)	Prob. of Real Asset Value < $100 at Year 30	Prob. of Reducing Real Pay (Average Yr 5~30)	Total Pay Present Value ($) r= 3.0%
1%	908	99	1%	9%	55
2%	697	167	3%	12%	95
3%	527	213	9%	15%	123
4%	402	243	18%	19%	144
5%	297	257	33%	23%	155
6%	223	265	50%	28%	163
7%	164	265	68%	33%	167

The general trends displayed in **Table 1** demonstrate the importance of the payout percentage decision. The terminal NAV at Year 30, which dramatically decreases as the spending rate gets higher (see second column), and the probability of the endowment losing real value, which dramatically increases as the spending rate gets higher (see fourth column), both represent unacceptably low levels of operational support at the lower spending rates and high long-term shortfall risk at the higher spending rates. Although most institutions target a spending rate in the 4–6% range, meaningful trade-offs are imbedded even within this seemingly narrow range.

Figure 1 charts the 30-year total payout against the risk of having to reduce real payout (inflation adjusted) year-over-year across different real equity return expectations. The general trend across all return scenarios is the same: There are diminishing benefits beyond a certain payout rate threshold.

Figure 1: Payout Frontier Under Different Expected Returns



The top line of the graph in **Figure 1** represents a 5.5% equity return environment, which is the base case embedded throughout this study. One can see here that the total payout increases only marginally as the spending rate is increased from 4% to 6% (the 7% spend rate represents a slight decline in total payout, interestingly). This slight increase in total payout, though, is accompanied by a much greater escalation in the risk of reducing real payout year-over-year. This flattened curve suggests that a 4% spend rate in the MA paradigm is a more optimal choice (although most institutions use a 5% target).

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We further look at the return sensitivity of this trend by comparing each of the three lines against each other. Interestingly, the lower the equity return, the more stretched the frontier becomes (i.e., the higher payout rates increase the risk of reducing real payout year-over-year much more substantially at lower equity return levels). Whereas this once again underscores the importance of selecting a moderate payout rate, even the 4% payout strains in a lower equity return environment of 2% (the bottom line). In this return scenario, the 4% payout represents an increase of more than 10 percentage points in the risk of reducing real payout as compared with the base case with the higher equity return. The MA's sensitivity to equity returns introduces the significant concern that this payout model may be particularly problematic in a prolonged low-return environment.

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Snake in the Tunnel Payout

Having raised a few questions about the MA spending policy, we'd like to introduce for comparison a second payout formula that has been adopted by some top-tier endowments. The spending model aims to maintain budgetary stability by simply increasing the annual payout each year by a certain inflation-linked rate. Intuitively, this more closely corresponds with how most institutions budget expenses for future years. Importantly, the model also incorporates a market-value-based element by establishing cap and floor boundaries within which the spending rate is allowed to wiggle (the so-called snake in the tunnel, or SIT). As an example, we evaluate a mechanism whereby the payout dollar amount starts at a 5% spending rate and grows at 2.5% per year (HEPI)[3], within 3% to 7% of endowment NAV bands. The payout amount then resets to 5% if the payout rate breaches either boundary. We use the same simulation framework as described in the previous section and first compare the SIT mechanism with those metrics presented for the 3-year MA mechanism.

Table 2: Comparison of Snake in the Tunnel and Moving Average Models

	Nominal Terminal NAV at Year 30 ($)	Total Pay over 30 years ($)	Prob. of Real Asset Value < $100 at Year 30	Prob. of Reducing Real Pay (Average Yr 5~30)	Total Pay Present Value ($) r= 3.0%
5% of 3-Year MA	297	257	33%	23%	155
SIT 3%~7%	319	254	32%	3%	153
4% of 3-Year MA	402	243	18%	19%	144

The 5% 3-year MA and SIT 3%–7% payout models yield similar results across a few important metrics. Over the longer term, they have a similar level of shortfall risk, terminal NAV, and total payout (see **Table 2**). However, what really makes the SIT stand out as a better method is that it offers a much smaller risk of cutting real payout year-over-year. The probability of cutting the payout in the SIT method versus the MA (at 5% and 3 years) is 3% versus 23% — a meaningful difference. In other words, the SIT method has about one-eighth of the risks of having to incorporate spending cuts as compared with the MA system. As such, the nature of the SIT paradigm provides much more stable, persistent, and predictable payout streams, which is valuable to budgetary offices and investment committees alike.

Because the catalyst for this study is the concern over slowing economic growth and the probability of a sustained low-return environment, we evaluate each spending model's sensitivity to return expectations. By looking at real-pay risks across different equity return assumptions, we find that the MA model is also much more sensitive to expected return reductions.

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Figure 2: Effect of Different Return Assumptions

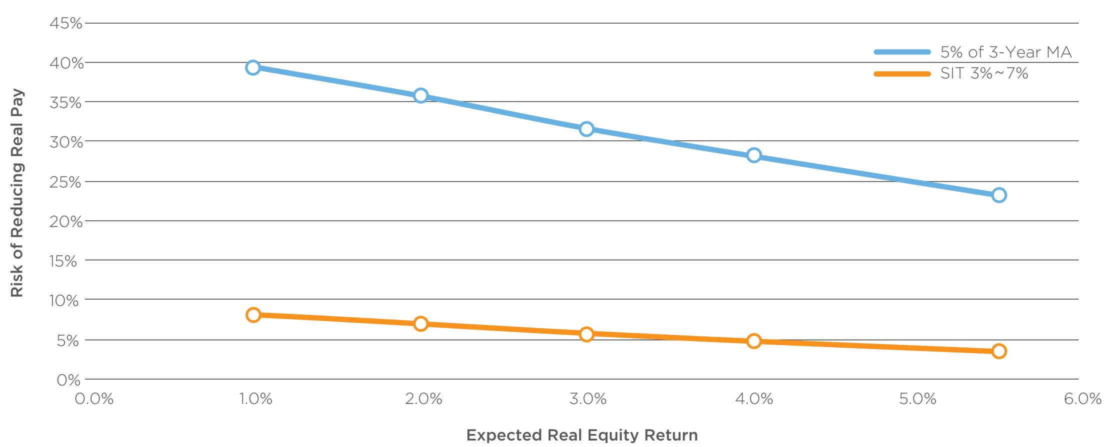

Figure 2 shows that at the lowest equity growth rate of 1%, the risk of having to reduce real pay using the MA method is about 30 percentage points higher than with the SIT dynamic. This spending drop could prove particularly disruptive, considering reliance on the payout could be especially high during times of market distress (as donations and other inflows are generally positively correlated with the market and therefore tend to decrease during periods of market strain). The resiliency of the SIT method is a meaningful finding, considering going-forward equity market concerns. Though the MA policy has been the standard over the past few decades, it seems that its vulnerabilities could be significantly exposed with lasting effects during a prolonged low-return environment.

Analysis of SIT Bands

Just as the selection of the percentage payout is very important in the MA scenario, the precise selection of the boundaries for the SIT method is also significant to maximizing the benefits of the model. Qualitatively, hitting the lower boundary means that the payout should be increased by more than just the cost rise, and it is indicative of good endowment returns; breaching the upper boundary means having to cut spending for that one year and is indicative of bad endowment returns. As a numerical example, from the 5% midpoint, it takes a roughly 16.7% (28.6%) drawdown in the last year for the payout to hit the 6% (7%) upper bound. These bands can be customized up or down, depending on the institution's unique needs, but we analyze a range of both tight and wide bands that center around 5% as a way to make a fair comparison with the popular 5% MA spending rule.

We look at the effects of adjusting the bands away from 4%–6% SIT boundaries (the tightest bands we study). Reducing the lower bound, e.g., from 4% to 3%, will increase the mean terminal NAV, reduce the long-term shortfall risk and reduce the risk of cutting year-over-year real pay. The lower bound means increasing payout less during a very good year, which reduces the chance of cutting in the following years and leads to higher terminal NAV through compounding. The portfolio is allowed to compound at a greater pace due to the decreased lower bound, and the higher reset spend rate (5%, in this case) is triggered later. Increasing the upper bound, e.g., from 6% to 7%, slightly reduces the mean terminal NAV and increases long-term shortfall risks but reduces the risk of cutting payouts even further. This is because in bad years, the upper bound is hit less often and spending is allowed to grow more (See Appendix 2).

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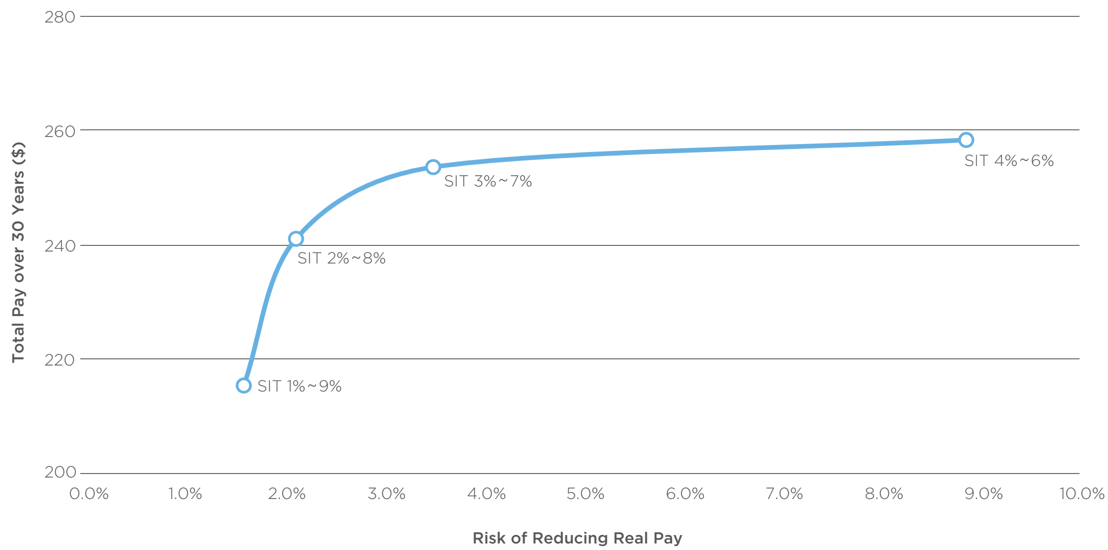
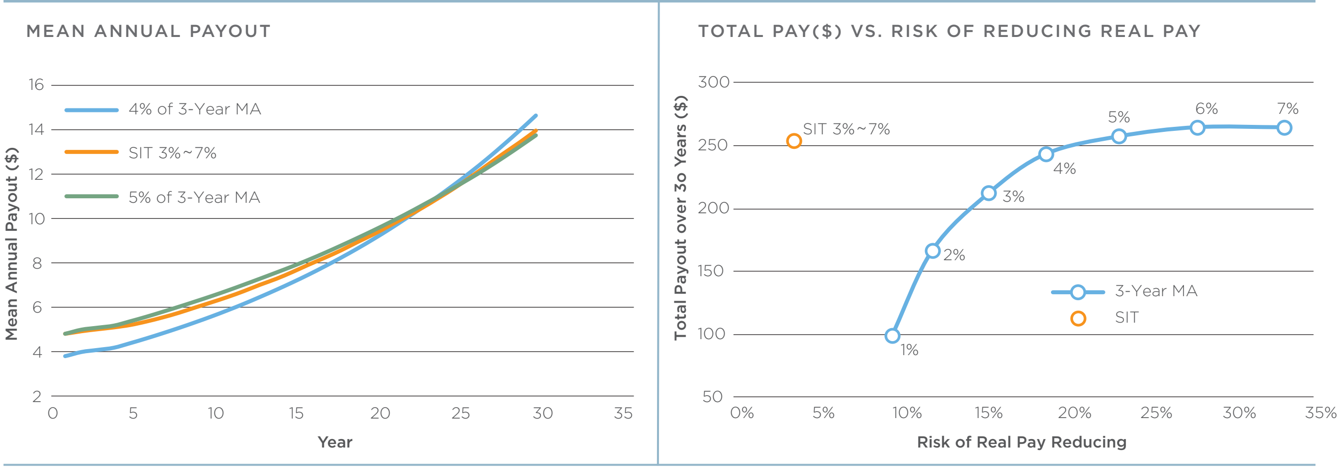
Figure 3: Total Pay vs. Risk of Reducing Real Pay at Different SIT Bands



The graph in **Figure 3** indicates that a 3%–7% band may be an optimal choice, as the risk curve flattens out meaningfully beyond the 3%–7% data point. In this paradigm, the total payout over 30 years is approximately the same as that of the 4%–6% choice, but with considerably less year-over-year downward risk in spending. We also observe that the wider the bands, the less frequently boundary conditions are met (and the less frequently spending is meaningfully changed). It is worth noting that bands can be "too wide" (i.e., the points for the 1%–9% and 2%–8% bands) because they lead to a likely insufficient level of financial support to the institution, with only marginal improvements in year-over-year downward risk in payout.

We conclude our analysis of the 3%–7% SIT model by comparing it directly with the 4% and 5% MA models, in an effort to show the short- and long-term impact of evolving to the SIT model. Forecasted annual payouts of each model (**Figure 4**, left), show that the SIT follows a path between 4% and 5% MA models. The implication here is that the 3%–7% SIT can effectively feel like having a 4% spending target after a period of time, but allows even more spending (in line with a 5% moving average) in the early years which can facilitate adoption. For an institution currently using the MA model, transitioning to an SIT spending policy may present an easier way to downshift spending from a 5% target, as it requires little short-term practical changes and does not entail an abrupt stepdown in spending. It also has better long-term results (**Figure 4**, right). Over a longer period of time, we see that the 3%–7% SIT provides a total payout in line with where the efficient frontier for the MA policy begins to flatten (at a 4%–5% spending rate, also see **Table 2**), but does so with meaningfully less risk of having to cut spending year-over-year. These findings should provide confidence that an alteration in spending policy can be implemented without meaningful disruption to the near-term or long-term financial support of the institution.

Figure 4: Transitioning to the Snake in the Tunnel Method



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Conclusion

Endowed institutions use a variety of spending methodologies, but most share the same dual mandate to preserve the endowment's long-term purchasing power while making annual payouts that are substantially supportive and predictable. We have analyzed two spending formulas that aim to accomplish this objective in different ways — one by taking the moving average of market values over a period of time and the other by making inflationary adjustments within market-value-based bands. We have presented a few metrics that are important to consider when evaluating a spending policy over the long term (total long-term payout, real shortfall risk, terminal value) and the short term (risk of reducing real payout year-over-year). We've also highlighted that key decisions reside within the larger policy choice, because the selection of the target spending rate and bands influences all these metrics.

Although a spending policy should be customized to the unique situation and needs of each institution, we encourage stakeholders to consider the three main takeaways of this paper.

- First, in the MA policy, lowering a target spend rate from 5% to 4% results in considerably less risk of the endowment losing real value over the long term and less risk that the endowment's real payout will be cut year-over-year, especially in a potential sustained low-return environment. While this finding is intuitive, it is nonetheless worth reiterating that relatively small downward adjustments in the spending target will deliver considerable stability to the long-term endowment and predictability in annual spending.

The fact that the MA policy demonstrates significantly larger risks of having to cut year-over-year real payouts as equity returns compress suggests that perhaps the model's biggest vulnerability could be concealed by extended periods of exuberant equity returns.

- Second, a comparison of the MA policy and the SIT policy reveals that the latter paradigm may be a prudent choice for the years ahead. Not only does it provide less year-over-year volatility in spending, but this characteristic is not meaningfully compromised by low equity market returns. The fact that the MA policy demonstrates significantly larger risks of having to cut year-over-year real payouts as equity returns compress suggests that perhaps the model's biggest vulnerability could be concealed by extended periods of exuberant equity returns.
- Third, a 3%–7% SIT policy offers an elegant mechanism to effectively adjust an institution's spending rate downward. At the beginning, it requires minimal practical changes to implement and provides annual spending in line with a 5% MA policy. It is only as the years progress and the portfolio (hopefully) grows that the effective spending rate will gradually compress. In this way, an SIT policy may provide a smooth evolution of annual payout that is more predictable and sustainable for investment and budgetary officers alike.

In sum, the recent investment environment has challenged many non-profit institutions, causing many to reexamine their policies in light of a likely low-return investment landscape ahead. We believe that now is a prudent time to evaluate internal procedures and that policies should be allowed to evolve or even change entirely if it is in the best interest of the institution those policies support.

Endnotes

[1] Source: "Educational Endowments Report -1.9% Return for FY2016 as 10-Year Return Falls to 5.0%," NACUBO, 1/31/2017, http://www.nacubo.org/Documents/about/pressreleases/2016%20NCSE%20Press%20Release%20FINAL.pdf.

[2] We combine all value-add from manager selection, tactical asset allocation and illiquidity premium into one combined measure of alpha.

[3] The Commonfund Higher Education Price Index ("HEPI") is an inflation index designed specifically to track the main cost drivers in higher education.

APPENDIX 1

Asset Class Return Assumptions

	Real Return	Volatility
Equities	5.5%	16.0%
Bonds	2.5%	4.0%
Inflation	2.0%	1.0%
Alpha	1.0%	3.0%

Asset Class Correlations

	Equities	Bonds	Inflation	Alpha
Equities	1.0	0.1	0.0	0.0
Bonds		1.0	-0.3	0.0
Inflation			1.0	0.0
Alpha				1.0

APPENDIX 2

Appendix 2: SIT Bands

	Nominal Terminal NAV at Year 30 ($)	Total Pay over 30 years ($)	Prob. of Real Asset Value < $100 at Year 30	Prob. of Reducing Real Pay (Average Yr 5~30)	Prob. of hitting lower bound	Prob. of hitting upper bound
SIT 3%~6%	335	251	28%	6%	4%	6%
SIT 3%~7%	319	254	32%	3%	3%	3%
SIT 4%~6%	293	258	33%	9%	9%	9%
SIT 4%~7%	284	265	37%	5%	8%	5%
SIT 2%~8%	354	241	32%	2%	1%	2%
SIT 1%~9%	403	215	34%	2%	0%	2%

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