Evaluating Spending Policies in a Low-Return Environment

If a low-return environment is ahead, what type of spending policy will provide the appropriate short- and long-term support?

TIAA Endowment & Philanthropic Services

Managing an endowment for both long-term intergenerational equity and short-term budgetary support presents challenges. Recent financial markets have further complicated this tension, as many organizations anticipate lower portfolio growth in the future.

While some organizations have incorporated lower return expectations into their forecasts, many of these same institutions have found it difficult to reduce their spending rates. According to recent National Association of College and University Business Officers (NACUBO) studies of endowment performance, most institutions have increased their endowment spending despite earning lower returns.[1] This dynamic could endanger the long-term viability of some of these institutions and represents one of the biggest concerns of nonprofits today.

This expected 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 critical to managing an endowment in these uncertain times. As has always been the case, a sustainable spending policy balances the competing objectives of providing a consistent flow of income to the operating budget, while also safeguarding the real value of the endowment over time. Given expectations of lower future returns, institutions should focus on spending policies that provide better predictability around spending as well as intergenerational equity.

We focus this analysis on two of the most common spending policies in use today:

1. The most common payout methodology, the **moving average (MA)** model
2. The "**snake in the tunnel**" (SIT) model, a formula used by a smaller (but growing) number of institutions

We evaluate both policies using 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 more effective at promoting payout stability from one year to the next, while also fostering superior endowment growth over the long term. Our analysis suggests that a spending policy based on the SIT model will likely be less sensitive to equity returns, making it the preferred spending policy in the sustained low-return environment anticipated by many.

The Moving Average Spending Policy

Market value-based spending policies are the spending formulas most commonly used by endowments today. Typically, the payout is based on a moving average (MA) of the endowment value over several years, e.g., 5% of a 3-year moving average. As compared with using one data point to calculate annual spending, the MA rule helps smooth the volatility of distributions year-over-year and lessens the drop in spending during acute market events.

We first focused our research on the MA spending rule to understand its sensitivity to the chosen payout rate. We ran a model for a hypothetical $100 70% equities/30% bonds policy portfolio with 1% alpha[2] that incorporates the traditional 3-year MA spending formula. Using simulations (see **Appendix 1**), we evaluated the outputs of 15,000 iterations across a 30-year time horizon.

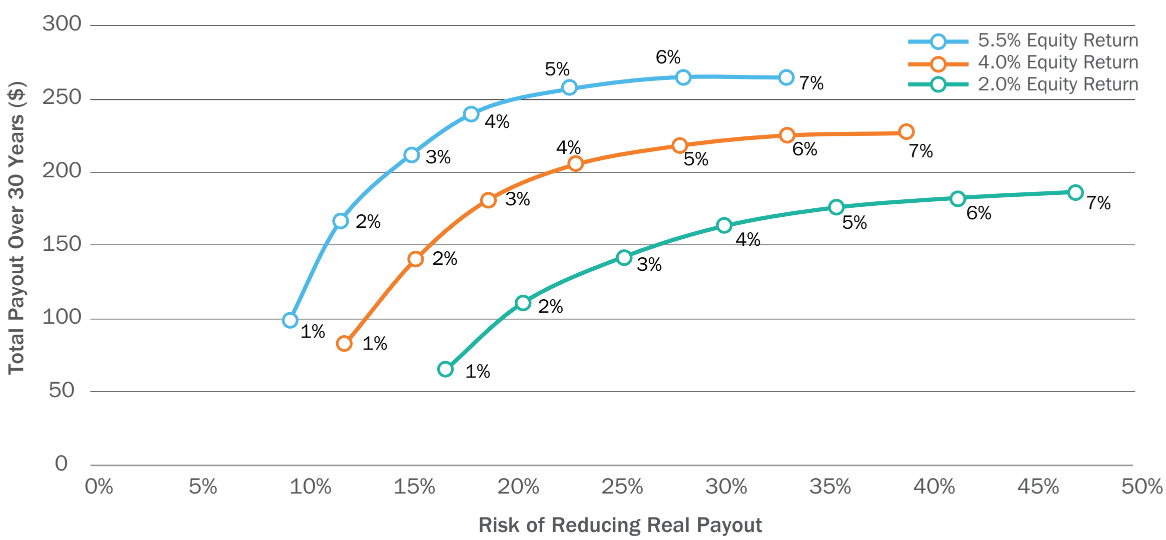
The trends displayed in **Table 1** demonstrate the importance of the payout percentage decision. The terminal value at year 30 dramatically decreases as the spending rate increases (see the second column), and the probability of the endowment losing real value dramatically increases as the spending rate increases (see the fourth column). Both trends suggest unacceptably low levels of operational support at lower spending rates and significant long-term shortfall risk at higher spending rates. While most institutions target a spending rate in the 4%–6% range, meaningful trade-offs are embedded even within this seemingly narrow range, especially in a sustained low-return environment.

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

% of 3-Year Moving Average	Nominal Terminal Value at Year 30 ($)	Total Payout Over 30 Years ($)	Prob. of Real Asset Value < $100 at Year 30	Prob. of Reducing Real Payout (Average Yr 5~30)	Total Payout Present Value ($) 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

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 assumptions (all return assumptions presented are real or inflation-adjusted). 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% real equity return environment, which is the base case embedded throughout this study. One can see here that the total payout over 30 years 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, however, is accompanied by a much greater increase in the risk of reducing real payout year-over-year. This flattened curve suggests that a 4% spending rate in the MA formula is a better choice (although most institutions use a 5% rate).

We can look further at the return sensitivity by comparing 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). This once again underscores the importance of selecting a moderate payout rate; even the 4% payout struggles in a low 2% real equity return environment (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 that assumes a higher 5.5% real equity return. The MA's sensitivity to equity returns suggests that this payout model might be problematic in a prolonged low-return environment.

Snake in the Tunnel Spending Policy

Some top-tier endowments have adopted an alternative spending rule, the snake in the tunnel (SIT) model. The SIT spending model aims to maintain budgetary stability by increasing the annual payout each year by a chosen inflation-linked rate. Intuitively, this approach more closely corresponds with how institutions budget expenses.

Importantly, the model also incorporates a market value-based element by establishing cap and floor boundaries outside of which the spending rate is not allowed to move (the so-called snake in the tunnel). We evaluated a model whereby the payout amount in dollars starts at a 5% spending rate and grows at 2.5% per year (HEPI)[3], within 3% to 7% of the endowment market value. The payout amount resets to 5% if the payout rate breaches either boundary. We use the same simulation framework as described in the previous section and start by comparing the SIT formula to the 3-year MA spending formula.

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 value, and total payout (see **Table 2**). However, what really makes the SIT model stand out as a better method is that it offers a much smaller risk of cutting real spending year-over-year. The probability of cutting the payout in the SIT method versus the MA rule (at 5% and 3 years) is 3% versus 23%—a meaningful difference. In other words, the SIT method has about one-eighth of the risk of having to make spending cuts as compared with the MA formula. As such, the nature of the SIT model provides much more stable, persistent, and predictable payout streams, which is valuable to budget offices and investment committees alike.

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

	Nominal Terminal NAV at Year 30 ($)	Total Payout Over 30 Years ($)	Prob. of Real Asset Value < $100 at Year 30	Prob. of Reducing Real Payout (Average Yr 5~30)	Total Payout Present Value ($) 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

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 payout risks across different equity return assumptions, we find that the MA spending formula is also much more sensitive to reductions in expected returns.

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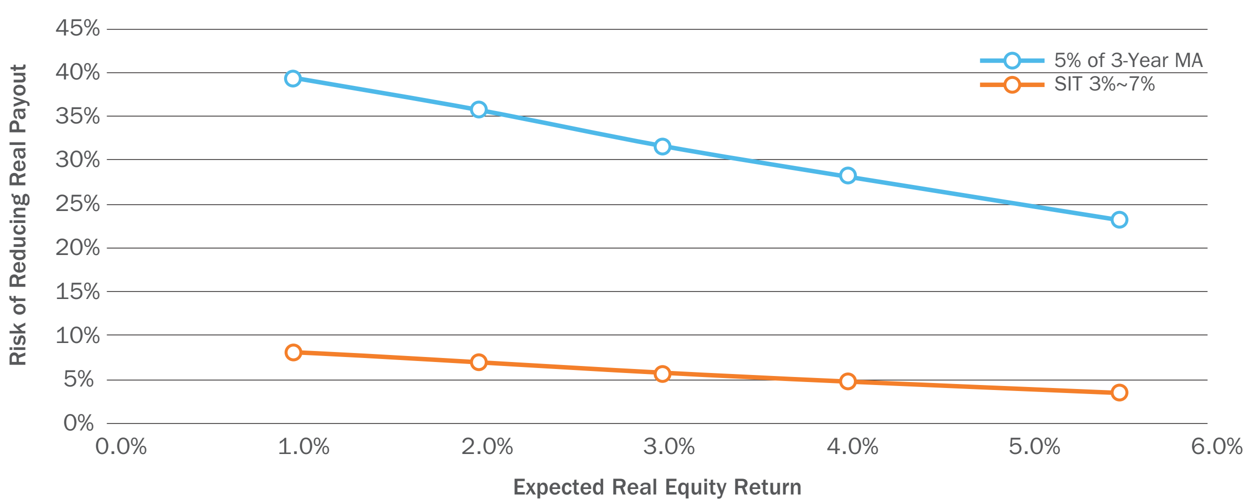
Figure 2 shows that at the lowest equity growth rate of 1%, the risk of having to reduce real payout using the MA method is about 30 percentage points higher than with the SIT formula. This spending drop could prove particularly disruptive, considering that reliance on the endowment payout could be especially high during times of market distress (as donations and other inflows tend to decrease during periods of market stress). The resiliency of the SIT method is a meaningful finding, considering concerns about future equity market returns. Although 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.

Figure 2: Effect of Different Return Assumptions



Analysis of SIT Bands

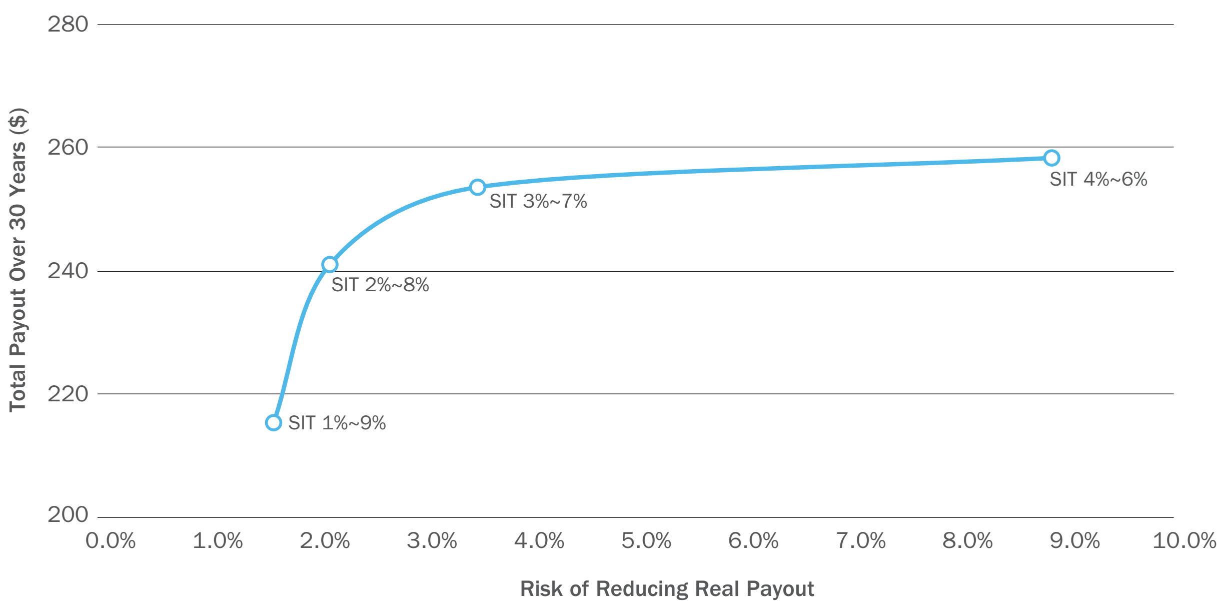
Just as the selection of the percentage payout is very important in the MA scenario, the selection of the boundaries for the SIT method is essential for maximizing the benefits of the model. Hitting the lower boundary means that the growth in the endowment value is significantly outpacing the payout rise rate, which is indicative of good endowment returns; breaching the upper boundary means having to cut spending for that year and is indicative of poor endowment returns. From the 5% midpoint, it takes a roughly 28.6% drawdown in the last year for the payout to hit the 7% upper bound (16.7% to hit the 6% upper band). While these bands should be customized up or down depending on the institution's unique needs, we analyzed a range of both tight and wide bands that center around 5% as a way to make a fair comparison with the more popular 5% MA spending rule.

We looked at the effects of widening the bands beyond the 4%–6% SIT boundaries, the tightest bands we studied. Reducing the lower bound from 4% to 3% increases the mean terminal value, reduces the long-term shortfall risk, and reduces the risk of cutting year-over-year real payout. The 3% lower bound means increasing the payout less during a very good year, which reduces the chance of cutting spending in the following years and it leads to a higher terminal value 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 from 6% to 7% slightly reduces the mean terminal value and increases long-term shortfall risk 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**).

Just as the selection of the percentage payout is important with the Moving Average rule, the selection of the boundaries for the Snake in the Tunnel method is significant to maximizing the benefits of the model.

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% band. With this band, the total payout over 30 years is approximately the same as with the 4%–6% band, but with considerably less year-over-year downside 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., 1%–9% and 2%–8%) because they likely lead to an insufficient level of financial support to the institution, with only marginal improvements in year-over-year downside risk in payout.

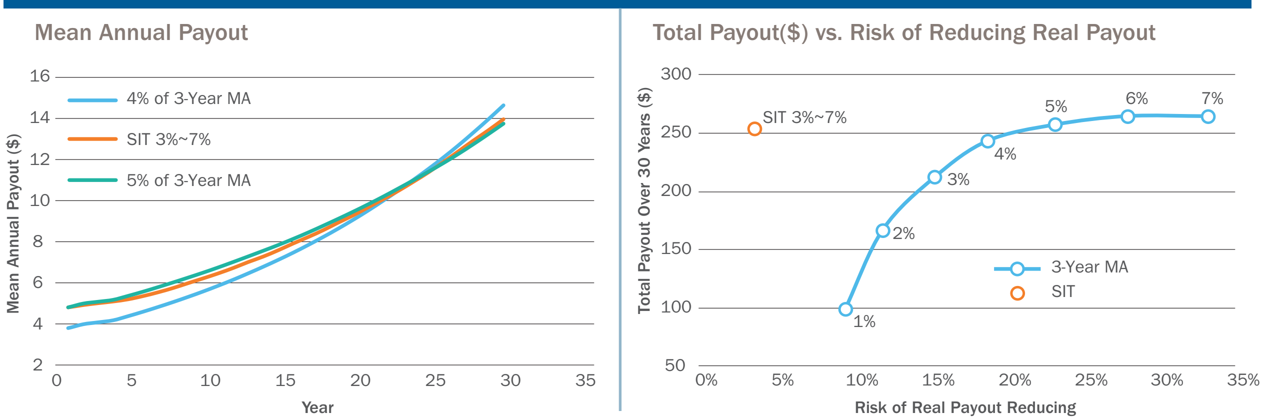
Figure 3: Total Payout vs. Risk of Reducing Real Payout at Different SIT Bands



We conclude our analysis of the 3%–7% SIT model by comparing it directly to the 4% and 5% MA models in an effort to show the short- and long-term impact of moving to the SIT model. Forecasted annual payouts of each model (**Figure 4, left**) show that the SIT spending rule follows a path between the 4% and 5% MA models. The implication is that the 3%–7% SIT can effectively feel like a 4% MA formula after a period of time, but it allows for 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 a SIT spending policy might present an easier way to downshift spending from a 5% rate, as it requires few short-term practical changes and does not result in 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, see **Table 2**), but does so with meaningfully less risk of having to cut spending year-over-year. These findings should provide confidence that a change in spending policy can be implemented without meaningfully disrupting the near- or long-term financial support to 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 objective of preserving the endowment's long-term purchasing power, while also making substantial and predictable annal payments to the operating budget. We analyzed two spending formulas that aim to accomplish this objective—one by spending a percentage of the moving average of market values over a period of time, and the other by making inflationary adjustments to spending within market value-based bands. We presented 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 also highlighted that key decisions reside within the larger policy choice as the selection of the target spending rate and the bands influences all of 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 observations of this paper:

1. With a MA spending policy, lowering the target spending 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 sustained low-return environment. While this finding is intuitive, it is nonetheless worth reiterating that relatively small downward adjustments in the spending rate will deliver considerable stability to the long-term endowment and predictability in annual spending.

2. A comparison of the MA policy and the SIT policy reveals that the latter approach might be a more prudent choice for the years ahead. Not only does it provide less year-over-year volatility in spending, but also the volatility 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 fall suggests that perhaps the MA model's biggest vulnerability has been concealed by extended periods of strong equity returns.

3. 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 fall. In this way, adopting a SIT policy can provide a smooth transition to an annual payout that is more predictable and sustainable for investment and budget officers alike.

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 Value at Year 30 ($)	Total Payout Over 30 years ($)	Prob. of Real Asset Value < $100 at Year 30	Prob. of Reducing Real Payout (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%

Endnotes

[1] Refer to the FY2016 and FY2017 NACUBO-Commonfund Study of Endowments reports, in particular.

[2] We combine all value-add from manager selection, tactical asset allocation, and illiquidity premia 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. Including 2017 data, 2.5% is the approximate average of the rate over the last 10 years.

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