The Appropriate Withdrawal Rate: Comparing a Total Return Trust to a Principal and Income Trust

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Editor's Note: Modern Portfolio Theory has become a customary tool used by investment professionals and, as such, constitutes an industry standard prudent fiduciaries cannot ignore. Further, the Prudent Investor Rule and Modern Portfolio Theory are inextricably intertwined. We have elected to publish four articles in consecutive editions of ACTEC Journal, *this current article being the last, in order to provide our readership with an understanding of Modern Portfolio Theory, demonstrate the necessity of applying this theoretical construct in accordance with the Prudent Investor Rule and apply this theory to other pertinent issues surrounding the administration and litigation of portfolios managed by fiduciaries. Sequential publication eliminates the need to redevelop Modern Portfolio Theory and other concepts in each article.* ACTEC Journal *readers will have the option of reviewing earlier articles to clarify any points of interest in subsequent articles.*

The first article, "Modern Portfolio Theory and the Prudent Investor Act", appeared in the ACTEC Journal, *Vol. 30, No. 3 (2004) and provided a foundation for understanding the underpinnings of Modern Portfolio Theory and how it should be applied under the Prudent Investor Rule. The second article, "Using a Trust's Investment Policy Statement to Develop the Portfolio's Appropriate Risk Level", appeared in the* ACTEC Journal *Vol. 30, No. 4 (2005), and emphasized the importance of developing an individualized Investment Policy Statement and how it can be used to develop an appropriate risk tolerance for the trust portfolio. The third article in this series "Computing Market Adjusted Damages in Fiduciary Surcharge Cases Using Modern Portfolio Theory" appeared in the* ACTEC Journal *Vol. 31, No. 1 (2005) and discussed the evolution of market adjusted damages and the appropriate process for assessing damages. We hope this series of articles has proved to be beneficial to our readers.*

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I. Introduction

Tom Harold swiveled his desk chair so he could look out the window from his office on the 33rd floor. Tom did this often when he was troubled. The city skyline view allowed him to put into perspective any of his concerns.

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Earlier in the week, Tom had a telephone conversation with Doris Winthrop, the widow of his best friend, Jared Winthrop. Jared had died unexpectedly at a relatively young age. Prior to his death, Jared had appointed Tom, with his concurrence, as successor trustee for his then revocable trust. The trust named his current wife, Doris, as income beneficiary and two sons from his first marriage as remainder beneficiaries. The trust language was rather standard and Tom, given his background in the investment industry, was comfortable with his ability to manage the trust in a professional manner. He was quite conversant with the requirements of Restatement (Third) of Trusts, the Prudent Investor Rule (Rule), the Uniform Prudent Investor Act (Act), and the Uniform Principle and Income Accounting Act (2001) (UPIAA).

During their conversation in early April 2005, Doris had complained bitterly about her most recent quarterly income distribution and the income she received during 2004 from the $15 million in trust assets. Under the trust's terms, her income disbursements were limited to traditional fiduciary accounting income. Given the interest rate downturn and relatively low dividend yield generated by equities, the trust's income had been declining since Jared's death three years ago. Currently the income from interest and dividends was approximately three percent of the trust's asset value. In their conversation, Doris indicated a strong desire for the trust's portfolio to be reallocated heavily toward debt, allowing for a larger dollar income distribution.

Adding to Tom's concern was the attitude of Jared's two sons toward their stepmother. Their relationship with Doris could be described as dysfunctional at best. He knew they would oppose vigorously any portfolio reallocation that increased Doris' income at the expense of their remainder interest upon her death —which, according to actuarial tables, was approximately twenty years hence.

Tom believed the trust's current asset allocation served the interests of both income and remainder beneficiaries reasonably well as required by his fiduciary duty of impartiality. He realized the portfolio's allocation was weighted somewhat toward income producing assets (debt and real estate investment trusts or REITs) to provide income for Doris and he thought any further weighting in that direction would be unfair to the remainder beneficiaries.

As Tom pondered the situation, he contemplated "total return investing" as a possible solution. Under the total return concept, he could invest the portfolio without concern as to whether the return came from income or appreciation. Upon advice of counsel, Tom understood in his jurisdiction he had available two alternative approaches: the power to adjust income and principal; and, conversion to a unitrust.

Based on §103 and §104 of UPIAA, Tom was confident that he had the power to make equitable adjustments and he decided to investigate this total return approach. However, he had always been a little unsure about the "Coordination with the Uniform Prudent Investor Act" section of UPIAA's Prefatory Note. Because he kept a copy of UPIAA on his desk, he picked it up and began to read a portion of that section:

> The law of trust investment has been modernized. See Uniform Prudent Investor Act (1994); Restatement (Third) of Trusts: Prudent Investor Rule (1992) (hereinafter Restatement of Trusts, 3d: Prudent Investor Rule). Now it is time to update the principal and income allocation rules so the two bodies of doctrine can work well together. This revision deals conservatively with the tension between modern investment theory and traditional income allocation. The starting point is to use the traditional system. If prudent investing of all the assets in a trust viewed as a portfolio and traditional allocation effectuate the intent of the settler, then nothing need be done. The Act, however, helps the trustee who has made a prudent, modern portfolio-based investment decision that has the initial effect of skewing return from all the assets under management, viewed as a portfolio, as between income and principal beneficiaries. The Act gives the trustee a power to reallocate the portfolio return suitably. To leave a trustee constrained by the traditional system would inhibit the trustee's ability to fully implement modern portfolio theory.[1]

Tom understood the intent of the section and had a reasonably sound understanding of Modern Portfolio Theory (MPT). However, he did not have a good grasp on how to determine the appropriate withdrawal rate for the current beneficiary and comport with his impartiality duty.

Tom decided to consult with John Dowd, a financial expert. During their conversation, John requested Tom send to him a copy of the current portfolio's holdings, the year-end statements for the past three years, a

[1] Uniform Principal and Income Act, Prefatory Note (amended last 2001).

copy of the trust document, and the trust's investment policy statement (IPS). John promised to provide Tom an analysis within the next three weeks. That analysis is the subject of the remainder of this article.

Section II presents the feasible set of assets from which the Efficient Frontier was constructed as of the end of March 2005. The development of a proposed portfolio is discussed and the proposed and current trust portfolios are examined relative to the Efficient Frontier. Section III describes the simulation results of the current and proposed portfolios under the assumption of different withdrawal rates. Section IV identifies the crossover rate as the withdrawal rate that matches the ending expected values of the current and proposed portfolios. Section V discusses the need for periodic review of the trust portfolio and the withdrawal rate. Section VI summarizes an approach for determining the appropriate withdrawal rate for a total return trust.

II. The Efficient Frontier and the Financial Expert's Proposed Portfolio[2]

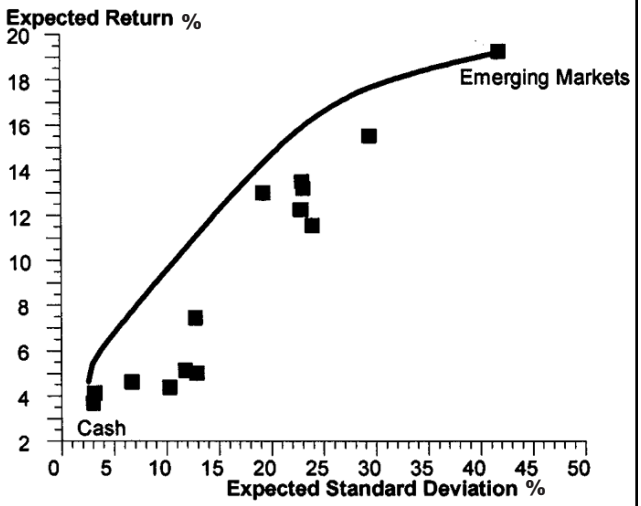
A. **The Feasible Set.** Upon receiving and reviewing the information from Tom, John created an Efficient Frontier as of the end of March 2005. He determined the asset classes and their corresponding benchmark indexes, shown in Chart II.1, which John determined to be appropriate under the circumstances, as the feasible set for constructing the Efficient Frontier.

Chart II.1
Feasible Set
Asset Classes and Their Benchmark Indexes

Asset Class	Benchmark
U.S. Large Cap Growth	S&P/BARRA 500 Growth
U.S. Large Cap Value	S&P/BARRA 500 Value
U.S. Mid Cap Equities	S&P MidCap 400
U.S. Small Cap Equity	Russell 2000
International Equities	MSCI EAFE
Emerging Markets	S&P/IFC Composite
Real Estate	NAREIT – Equity
U.S. Intermediate Gvt Bonds	Ibbotson Associates US IT Gvt Bonds
U.S. Short Term Gvt Bonds	Ibbotson Associates US 1 yr Treasury
U.S. High Yield Bonds	Lehman Bros. High Yield Index
U.S. Long Term Gvt Bonds	Ibbotson Associates US LT Gvt Bonds
Municipal Bonds	Lehman Bros. 20 yr Municipal Bonds
International Bonds	Solomon Bros. Non-US 1 yr Gvt Bonds
U.S. Cash Equivalent	Solomon Bros. 90 Day T-Bills

B. **The Efficient Frontier.** The Efficient Frontier that results from the feasible set is shown in Chart II.2.[3]

Chart II.2
Feasible Set of Indexes and Their Efficient Frontier as of March 2005



C. **Actual and Proposed Portfolios.** John examined the current trust portfolio as of March 2005 and assigned each of the assets in the portfolio to a specific asset class. The composition of the current trust portfolio, in terms of dollars and percentage of the total portfolio, is shown in Chart II.3. He noted the portfolio asset allocation had not changed significantly over the past three years and he was comfortable using the current allocation.

After reviewing the IPS and assessing the required return contained in the policy statement, John located a portfolio on the Efficient Frontier containing an expected return, and thus expected risk, higher than the level indicated in the current IPS.[4] John deemed increasing portfolio expected return and risk as consistent with the concept of total return investing. If the trust was allowed to distribute income and principal to the income beneficiary, the portfolio would no longer be constrained to invest a large percentage of its assets in low-return, income-producing securities. After examining the composition of the proposed portfolio, its location relative to the Efficient Frontier, and its associated expected risk, John was comfortable in selecting the proposed portfolio shown in Chart II.3.

[2] A discussion of the underpinnings of Modern Portfolio Theory and its connection to the Prudent Investor Act appears in the first article in this series.

[3] Other than the two end point asset classes, Cash and Emerging Markets, the asset classes in the feasible set are not labeled in Chart II.2. This was done to avoid clutter in the chart. The unlabeled boxes in the chart represent the remaining 12 asset classes considered as part of the feasible set.

[4] The use of the trust's investment policy statement to assist in determining the appropriate risk level for a trust is presented in the second article in this series.

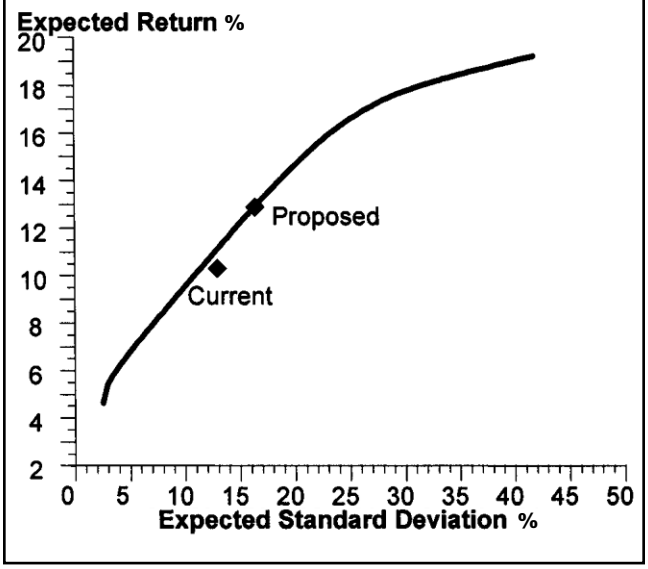
Chart II.3
Current and Proposed Portfolio Allocations as of March 2005

Asset Class	Current Portfolio $	%	Proposed Portfolio $	%*	Change %
U.S. Large Cap Growth	1,500,000	10			-10
U.S. Large Cap Value	4,500,000	30	2,410,500	16	-14
U.S. Mid Cap Equities			2,874,000	19	+19
International Equities	1,500,000	10	1,092,000	7	-3
Emerging Markets			2,554,500	17	+17
Real Estate Investment Trust	3,000,000	20	3,711,000	25	+5
U.S. Long Term Gvt Bonds	3,000,000	20			-20
International Bonds			2,358,000	16	+16
U.S. Cash Equivalent	1,500,000	10			-10
	$15,000,000	100%	$15,000,000	100%	

*Note: Percentages are rounded.

The current and proposed portfolios relative to the Efficient Frontier John created are displayed in Chart II.4.

Chart II.4
Actual and Proposed Portfolios Relative to the Efficient Frontier as of March 2005



D. **Preparing for the Simulation.** John's next step was to compare the current and proposed portfolios by simulating returns over a twenty year investment horizon—Doris' life expectancy. In preparing the simulation, John noted the trust had passed all income to Doris. Tom had also managed the trust such that historically all capital gains had been offset by capital losses and the portfolio did not incur capital gains taxes. Though perhaps slightly unrealistic, for illustrative purposes John assumed the trust would continue not to be liable for capital gains taxes. Neither would it be liable for income taxes as it was expected all net income would be distributed within the anticipated withdrawal amount. He also gathered statistics (expected returns, standard deviations, and correlations) on the performance of the asset classes in Chart II.3 for the period 1991 through March 2005.[5]

III. Simulation of Investment Returns

A. **Purpose of the Simulation.** John used a simulation to help him compare the current and proposed trust portfolios and to determine a new withdrawal rate that balanced Doris' need for current distributions with her stepsons' desire for capital growth. Towards this end, John's simulation was designed to identify the maximum withdrawal rate, or crossover rate, such that the remainder beneficiaries' expected ending value of the proposed portfolio is not less than the expected ending value of the current portfolio at its current 3% withdrawal rate. John realized that to generate a crossover rate, the proposed portfolio must offer a higher expected return and, thus, more risk than the current portfolio. John's proposed portfolio, shown in Chart II.3, met this criterion.

B. **Inputs to the Simulation.** Because an investment return simulation requires values for each constituent asset class to describe a portfolio's future path, John used the historical asset class statistics to build forecasts. He knew asset class returns should not be forecast independently, however, because MPT recognizes the importance of the relationships between them.[6] John simulated short-term interest rates and

[5] The historical record of the indexes varies from 80 to 13 years. In this case the shortest index began in 1991.

[6] For example, the simulation assumes small cap stocks will have a higher expected risk and return than large cap stocks. Though large cap stock returns might be higher than small cap stock returns in any one period, they should not be systematically higher over time. Similarly bonds are assumed to have a lower average expected risk and return than stocks. The simulation also assumes that all assets have correlations that are stable on average.

used the relationship between those short-term rates and the asset classes in the feasible set to build scenarios of returns for the actual and proposed portfolios over twenty years.[7]

C. **Simulation Results.** John's simulation produced 500 return scenarios.[8] Chart III.1 summarizes these scenarios by listing the 95th through the 5th percentile of the returns to the two portfolios over the 500 scenarios. As John expected, the proposed portfolio outperformed the current portfolio at every level.

Chart III.1
Simulated Return Percentiles
20 Year Horizon

Percentile	Current	Proposed
95th	14.07%	17.68%
75th	11.38	14.10
67th	10.74	13.13
50th	9.59	11.67
33rd	8.45	10.29
25th	7.82	9.33
5th	5.17	6.16

D. **Withdrawal Rates.** Chart III.2 compares the distribution of the ending values for the two portfolios at the current 3% withdrawal rate.

Chart III.2
Simulated Ending Value Percentiles
at the End of a 20 Year Horizon
3% Annual Withdrawal Rate

Percentile	Current	Proposed
95th	$113,422,505	$211,678,496
75th	70,393,831	114,043,398
67th	62,761,548	96,165,775
Expected	*57,937,192*	*91,984,784*
50th	50,933,540	74,116,761
33rd	41,300,823	57,806,309
25th	36,759,138	48,599,335
5th	22,346,198	26,966,459

John noted across the entire distribution the proposed portfolio had higher simulated ending values after twenty years than the current portfolio.[9] As expected, these results were consistent with his construction of the proposed portfolio with a higher expected return than the current portfolio. The chart indicated also the proposed portfolio had a wider range of possible outcomes, reflecting its higher risk.

E. **Target Expected Ending Values.** John's targets for the simulation were a series of expected ending values for the proposed portfolio at different withdrawal rates that bracketed the expected ending value of the current portfolio ($57,937,192) at the 3% withdrawal rate. He knew that as the withdrawal rate increased the expected ending value naturally falls. Chart III.3 shows John's simulation results with different withdrawal rates.

Chart III.3
Distributions of Possible Ending Values
for the Proposed Portfolio
at Different Withdrawal Rates
at the End of a 20 Year Horizon

	Withdrawal Rates		
Percentile	4%	5%	6%
95th	$172,054,770	$139,544,962	$112,927,348
75th	92,695,815	75,180,909	60,840,467
67th	78,164,672	63,395,431	51,303,019
Expected	*74,766,314*	*60,639,193*	*49,072,522*
50th	60,242,975	48,860,044	39,540,196
33rd	46,985,647	38,107,693	30,838,811
25th	39.502,111	32,038,173	25,927,027
5th	21,918,655	17,777,118	14,386,207

In reviewing Chart III.3, John observed that with a 5% withdrawal rate, the simulation produced an expected ending value of $60.6 million. With a 6% withdrawal rate it produced an expected ending value of $49.1 million. The current portfolio's ending expected value is $57.9 million with a 3% withdrawal rate. Therefore, a withdrawal rate between 5% and 6% from the proposed portfolio would provide Doris with additional income while leaving the stepsons no worse off in terms of the expected ending portfolio value twenty years hence. Thus the crossover rate is between 5% and 6%.

[7] Many possible simulation techniques exist to take account of all these relationships. Most of the investment-oriented simulations use a variation of the Monte Carlo approach, so named because it uses a random number generator (like a Roulette wheel) to create investment scenarios. Our goal is not to explain the detailed calculations of the simulation – different experts may very well come to different results because they use different inputs – but to show how the results could be used.

[8] In general the more scenarios the more accurate is the simulation in terms of reducing the variability of results. The number of scenarios used here is reasonable for expository purposes and should be determined on a case-by-case basis.

[9] The expected value, the probabilistic expectation of all the possible ending values, is not equal to the median because the empirical distribution is not symmetric.

IV. The Crossover Rate

A. **Identifying the Crossover Rate.** John next created Chart IV.1, summarizing the simulations. It shows the expected ending values of the current and proposed portfolios under different withdrawal rate assumptions.

Chart IV.1
Determination of the Crossover Rate Based on Different Withdrawal Rates and Expected Portfolio Values at the End of a 20 Year Horizon

Withdrawal Rate	Expected Value Current Portfolio	Expected Value Proposed Portfolio
3%	$57,937,192	$91,984,784
4%	47,092,031	74,766,314
4.5%	42,421,907	67,351,728
5%	38,193,976	60,639,193
5.215%	36,540,394	57,937,192
6%	30,908,635	49,072,522

At a withdrawal rate of 5.215% the expected ending value of the proposed portfolio was equal to $57.9 million, the targeted ending value. He elected to recommend to Tom that he propose a 5% withdrawal rate to the beneficiaries. John had a number of reasons for recommending a withdrawal rate slightly less than the crossover rate. First, the increase in the withdrawal rate from 3% to 5% represented a significant, immediate increase in annual income for Doris of $300,000 or 67% from her current level. Second, Doris' stepsons would realize that the expected value of the proposed portfolio in twenty years would be almost $2.7 million ($60.6 - $57.9) larger at a 5% withdrawal rate than the expected value of the current portfolio with a 3% withdrawal rate. Although John recognized the proposed portfolio carried more risk, he thought the stepsons would agree to the change in withdrawal rate because their interest in terms of expected value would be increased. Finally, the 5% withdrawal rate was within the 3% - 5% range often considered reasonable by some fiduciaries and, perhaps, a safe harbor in some jurisdictions.

B. **Another Advantage of the Proposed Portfolio.** John noted that Chart IV.1 also underscores one of the advantages of moving to the proposed portfolio. If the current portfolio is maintained and the withdrawal rate increased to 5%, the expected value twenty years hence falls to $38.2 million from $57.9 million, almost a $20 million decline. Changing the portfolio composition avoids the problem of increasing the withdrawal rate to satisfy the income beneficiary without regard to the ultimate impact on remainder beneficiaries.

V. Periodic Review

A. **Annual Reviews.** John realized implementation of the proposed portfolio and new withdrawal rate should not be put into practice and forgotten. Over time capital markets change. What appears to be appropriate policy given currently available information may not hold into the future. Therefore, he planned to recommend a formal review of the portfolio's asset allocation and the withdrawal rate be undertaken, preferably each year.[10]

B. **Potential Adjustments to the Withdrawal Rate.** John also intended to stress to Tom the importance of explaining to the trust's beneficiaries what might happen in the future. For example, if capital markets declined for an extended period, then to maintain impartiality among the beneficiaries either a) Doris would have to accept a lower withdrawal rate, b) the remainder beneficiaries would have to accept a lower ending expected value, c) the trust portfolio's composition would have to be reconstructed resulting in a higher level of expected return and risk, or d) a combination of the above.

VI. Conclusions

A. **Impartiality**. Tom finished reading John's report and was somewhat relieved it provided support for his total return investing solution. The problem of balancing Doris' current distribution requests and the stepsons' interest in maximizing their remainder value would always remain. Though he was confident about implementing John's recommendation for the portfolio's allocation, his concern was getting the beneficiaries to agree so as to avoid potential acrimony and possible litigation. Because the proposed portfolio carried more risk than the current portfolio, Tom was concerned that a 5% withdrawal rate might be perceived as favoring unfairly the current beneficiary at the remainder beneficiaries' expense.

B. **Return and Risk.** Tom began to formulate how to present the new investing and withdrawal approach to the beneficiaries. He was particularly pleased that the charts in John's report were, for the most part, formulated in terms of dollars. Tom had always found that in explaining outcomes to financially unsophisticated people, dollar figures had much more meaning than percentages. He wanted to present his recommendation as a potential "win-win" situation for all parties, but he was not certain the stepsons would believe they benefited from the proposed portfolio allocation and a 5% withdrawal rate. Tom was concerned the stepsons would not perceive much gain to themselves, particularly in light of higher risk in the proposed portfolio.

[10] This recommendation is consistent with the need for a periodic review of the IPS suggested in the second article of this series.

C. **Withdrawal Rates, Fairness and Compromise.** The withdrawal crossover rate determination of 5.125% was extremely helpful to Tom in setting an upper limit to the new withdrawal rate. But, to pursue his win-win strategy, the proposed withdrawal rate would have to be, as John suggested, less than the crossover rate. In examining Chart IV.1, Tom was pleased that John had presented a 4.5% withdrawal comparison of expected portfolio values. At a 4.5% withdrawal rate, Doris would receive a substantial increase in annual income, at least initially, from $450,000 to $675,000. The expected value of the portfolio in twenty years would be $67.4 million as compared to the expected value under the current portfolio allocation and 3% withdrawal rate of $57.9 million. Tom planned to explain to the beneficiaries that this arrrangement was subject to change depending upon an annual review. Nevertheless, he was hopeful both sides would agree to compromise and accept his porposed changes.