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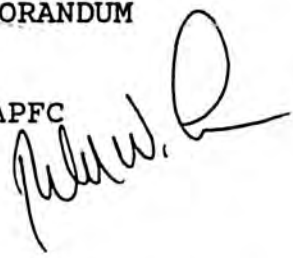
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MEMORANDUM

To: Byron I. Mallott
Executive Director, APFC

From: Ron Lorensen, STS&L 

Date: December 2, 1995

Re: Need for Proposed Constitutional Amendment to Permanent
Fund Provision to Implement Endowment Concept
Our File No.: 846.2

You recently asked me to address the question raised by Trustee Clark Gruening (November 17, 1995 memorandum) of whether an amendment to the constitutional provision dealing with the Permanent Fund (Art. IX, sec. 15, Alaska Constitution¹) was necessary to implement the endowment concept recommended by the State Long Range Financial Planning Commission ("the Commission") in its Final Report. Subject to one important qualifier, I think the answer is that a constitutional amendment is not legally necessary.²

¹ Art. IX, sec. 15 provides as follows:

SECTION 15. ALASKA PERMANENT FUND. At least twenty-five percent of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payment and bonuses received by the State shall be placed in a permanent fund, the principal of which shall be used only for those income-producing investments specifically designated by law as eligible for permanent fund investments. All income from the permanent fund shall be deposited in the general fund unless otherwise provided by law.

² Whether it might be desirable, as a matter of policy (or politics), to present the proposed shift to an endowment concept for the Permanent Fund to the voters, be it in the form of a

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Under Art. IX, sec. 15, the Fund's principal (i.e., receipts placed in the Fund, plus any additional monies appropriated to the Fund by the Legislature) may not be drawn upon for any reason--ever. The income of the Fund, on the other hand, is all available for transfer to the general fund, unless the Legislature provides otherwise by law.³ This distinction between principal and income under the constitution provides a clear dividing line in determining what part of the Fund may be paid out by the Legislature to be used for various governmental and other public purposes.⁴

This principal/income distinction does not play a specific role (or serve a particular function) under the endowment approach recommended by the Commission. The goal of endowment-type funds is to establish a rate of withdrawal of assets from the fund that, over the longer term, will maximize the amount available for expenditure while maintaining the purchasing power of the fund. This withdrawal or "payout"⁵ rate for a particular year is typically determined as a percentage of the fund's average market value over a specified number of preceding years. Once established, the payout rate remains constant from year to year, although subsequent experience with a fund's actual performance may lead to later adjustments or "fine-tuning" of the rate. The annual payout rate proposed by the Commission is four percent, applied to the Fund's average market value in the immediately preceding five years.

By looking at the Fund's market value as the basis for computing the annual payout, the distinction between principal and income becomes essentially irrelevant. This is because market value depicts the total value of the Fund's assets, whether they derive from principal or the income generated by it. The fact that the principal/income distinction would become irrelevant does not mean, though, that Art. IX, sec. 15 must be changed. Unless the constitutional provision as it now reads would preclude or otherwise interfere with implementation of the endowment concept

constitutional amendment, an advisory vote, or otherwise, is a question that is beyond the scope of this memorandum.

³ Which it has done, both by general law (e.g. the Permanent Fund Dividend Program under AS 43.23 and "inflation-proofing" under AS 37.13.145(c)) and by special appropriation.

⁴ To date, the principal uses of Fund income by the Legislature have been to "inflation-proof" the Fund and to pay annual Permanent Fund dividends to Alaskans.

⁵ This is the term used by the Commission.

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recommended by the Commission, there would be no legal need to amend it.

Certainly, the Legislature could enact a general law that provided both that all income of the Fund was to be retained in the Fund⁶ and that there would be an annual payout from the Fund to the general fund based on application of a fixed payout rate to the Fund's market value, averaged over a specific period. Nothing in the constitution would have to be changed in order for the Legislature to be able to do either of these things. However, there is at least a theoretical possibility that the computed payout amount for a particular year would exceed available income, necessitating an "invasion" of principal, which is not allowed under Art. IX, sec. 15.

In point of fact, this theoretical possibility is probably just that. Given that the payout is based on a five year average and that the Fund continues to grow each year through additional receipts, the actual payout in a year, expressed as a percentage of the Fund's market value in that same year, will almost certainly be less than four percent.⁷ At the same time, the Fund's historical earnings rate is substantially above four percent. Under the endowment approach, the excess earnings would be left with the Fund, quickly accumulating a substantial cushion of "retained earnings"⁸ from which the payout could be satisfied if necessary.⁹

Rather than amend the constitution to deal with this theoretical conflict, the Legislature could address it as part of

⁶ This provision would be necessary to reverse the effect of Art. IX, sec. 15 that all income of the Fund is to be deposited in the general fund, unless otherwise provided by law.

⁷ The only time this would not be true would be when the market value of the Fund had declined to or below its average value over the previous five years. The Fund has never experienced such a significant loss in value.

⁸ In retaining all income in the Fund by general law, the Legislature might wish to create a separate retainage account in the Fund into which the income would be deposited in order to provide for this cushion, rather than automatically convert retained income into "principal."

⁹ In this regard, it would probably be instructive to perform a historical analysis of the Fund's performance to evaluate whether and how the constitution's proscription against using principal would have been implicated if the endowment concept had been applied to the Fund since its inception.

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an enactment implementing the endowment/annual payout concept. This could be done by a provision saying that the payout for a year would be either the amount computed by applying the payout rate to the Fund's average market value for the specified number of preceding years or the amount of income available for distribution (i.e. without "invading" principal), whichever is less. If this kind of safeguard were incorporated into legislation utilizing the Permanent Fund as an endowment, the potential conflict with the present constitutional provision would be avoided, and there would be no legal need to amend it.

I hope this memorandum has been responsive to your inquiry. If you or any of the Fund's Trustees have any questions about it or would like to discuss the issue further, please do not hesitate to contact me.

cc: Jim Baldwin, AAG
Department of Law

November 27, 1995

**Alaska Permanent Fund Corporation
Board Workshop**

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Executive Vice President

**Alaska Permanent Fund Corporation
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Endowment Management A Primer

Our objective in this segment of the report is to outline the investment policy questions confronting overseers of endowment assets. We will briefly describe key management issues, basic investment concepts and modern endowment management practices and trends.

Purpose

Endowments typically represent the permanent funds of an educational or other institution. They are designed to provide revenues that will support the institution forever. Conceptually, most would argue that the level of support should be neutral from an intergenerational perspective. In other words, the support provided current operations should be maintained in perpetuity.

Goals

The goals implicit in an endowment's basic purpose are to preserve principal and to provide a meaningful and stable flow of revenue to help fund operations. These two basic goals inherently conflict. It also is obvious that both presume attainment in inflation adjusted terms. Preservation of principal is actually preservation of purchasing power. Maintaining a meaningful and stable contribution to operations dictates a revenue stream that grows with inflation.

The table below illustrates the effect of inflation on purchasing power.

<u>Inflation Rate</u>	<u>Time to Half Purchasing Power</u>
2%	36 Years
3%	24 Years
4%	18 Years
5%	14 Years
6%	12 Years

Mr. David Swensen, Chief Investment Officer of Yale University, illustrates the conflict between the dual endowment goals by contrasting two extreme distribution (spending) policies: "On one hand, if the institution could spend only the real returns generated by the portfolio, asset purchasing power could be maintained perfectly. Assume investment returns are 10% in one year and inflation is 4%. If the 6% real return on endowment value is distributed to the operating units and the 4% attributable to inflation is reinvested in the endowment fund to maintain purchasing power, all constituents are satisfied. In the following year, assume that investment returns are only 2% and inflation is 7%. Now the institution faces a serious problem. Compensation for inflation requires a 7% reinvestment in the endowment, but the fund only generated a return of

2%. The endowment manager cannot go to the operating units and ask for 5% rebates to maintain the purchasing power of assets. Thus, a policy that seeks to maintain asset purchasing power without exception is not feasible.

The other policy extreme, pursuing the goal of providing a completely stable flow of resources to the operating budget could be accomplished by spending a fixed amount that is increased each year by the amount of inflation. In the short-term, the flow of resources from the endowment to the operating budget will be perfectly stable and quite predictable. Under normal market conditions, such a policy might not be harmful. In a period of sustained declines in endowment market value, however, spending at a level independent of the value of assets could cause a loss of capital that would permanently damage the endowment fund.

A spending policy must be devised that addresses the conflicting objectives of preserving purchasing power and providing a stable flow of resources to the operating budget. Most institutions achieve the balance by determining a sensible long-term target rate of spending and applying that rate to a moving average of endowment market values."¹

Historical Perspective

Managing an endowment portfolio provides a fiduciary challenge similar to that of managing a trust in which there are distinct income beneficiaries and remaindermen. Taking actions to enhance the income beneficiary's return works to the disadvantage of the remaindermen and the converse, emphasizing growth penalizes the income beneficiaries. Prior to 1970, many, if not most, endowments had spending policies that were linked to income. Managers attempted to balance conflicting interests by investing a portion of the fund's assets for growth and a portion for income generation. The Ford Foundation, in 1972, published a study that strongly advocated the use of a "total return" investment approach and a market linked spending policy. While the timing of the study was unfortunate and many of its conclusions criticized, the basic principles have achieved wide spread acceptance among major endowments and foundations.

A 1992 Survey of Educational Endowments conducted by NACUBO found the following spending policies:

<u>Spending Rule</u>	<u>Percentage</u>
Spend all Current Income	17.4%
Spend a Percent of a Moving Average Market Value	48.4%
Spend a Percent of Prior Year Spending	5.7%
Determine Spending Rate Each Year	13.8%
Other Spending Rule	<u>14.7%</u>
Total	100.0%

¹ References throughout to Mr. Swensen are to: David F. Swensen, *AIMR Seminar Proceedings Investment Policy: Endowment Management*, Association for Investment Management and Research, 1994, Pgs. 30-40.

The extensive reliance on a spending policy that is independent of income is consistent with the heavy reliance that private educational endowments and foundations have placed on equity oriented investments and a "total return" investment philosophy.

It, however, should be noted that public sector funds, of which there are comparatively few, tend to employ spending policies that are linked to income (or realized return). There have been attempts to shift toward market linked approaches but they have not achieved notable success. Some opine that a primary factor slowing acceptance in the public arena is the heavy historic emphasis placed on fixed income assets. Movement away from an income based distribution approach might result in lower current distributions, a frequently unacceptable consequence.

Callan assisted the New Mexico State Investment Board evaluate the implications of a proposed constitutional change that was unsuccessful, but which may provide useful insight. Realized return from the State's Tax Severance Fund is added to the State's General Fund. Realized return from the State's Permanent Fund is used to support education. The proposed constitutional change would have changed spending from a realized return basis to a percent of moving average market value approach. Since current distributions exceeded the proposed moving average percentage, the proposed change also included a transitional element that stipulated that each year's spending had to, at a minimum, be 102% of the prior year level. The consequence of this feature was that perceived benefits of the change (in terms of inflation protection) were not likely to be realized for more than a decade. The proposed change also included provisions that would have liberalized the current legal list investment approach. Some opponents felt that limitation on spending was unnecessarily inflexible, that it would tie the hands of future state legislatures and administrations. Others were concerned that the 102% of prior year spending rule would result in an invasion of principal. Still others were concerned with the broadening of permissible investments. Supporters of the change felt that the current "realized return" distribution policy resulted in too heavy an emphasis on fixed income securities. They also argued that pressure to increase current earnings increased in periods of low interest rates. Some supporters of the change felt that achievement of a strategic asset allocation policy that would be consistent with maintenance of purchasing power could not be accomplished with the current spending approach. They noted that in the 1960's and 1970's, the funds failed to keep pace with inflation and, in fact, were distributing corpus. They viewed the 1980's and early 1990's as an extraordinary investment environment.

In the final analysis, proponents argued that something like a 50/50 asset mix policy was essential for attainment of long-term goals and that such a policy could best be implemented and maintained if distribution levels were determined independently from short-term earnings (i.e., a percentage of market value related approach). Opponents, while agreeing with the heavier than historic equity targets, argued that there was not need to change the constitution to implement the strategic asset mix target.

Essential Conclusion

Regardless of the approach utilized to determine distributions, it is obvious that inflation is the primary obstacle to achievement of long-term objectives. It is, therefore, apparent that some

portion of average current earnings must be retained to preserve purchasing power. For example, presume an all bond portfolio, steady inflation of 4% and a coupon return of 7%. If all earnings were distributed, the fund would, in effect, be distributing 4% of principal each year. If 5% of year-end market value were distributed, there would be a 2% average erosion of purchasing power corpus.

To achieve the dual long-term goals, the distribution policy must be reasonable and consistent with the fund's investment policy. For example, either an income based distribution policy or a market value linked spending policy combined with a risk averse short-term fixed income investment policy, will fail to preserve purchasing power. An income based spending approach combined with an 80% equity related investment policy probably would result in a comparatively low and volatile distribution stream.

As the survey of spending policies noted earlier demonstrates, comparatively few endowments and foundations rely on an income based spending approach.

Endowment Investment Practices

Major endowments and foundations tend to be comparatively aggressive investors. The 1995 Money Market Directory found that less than 35% of endowment and foundation assets were allocated to fixed investments. Public pension funds typically had 40-45% allocation to comparable investments. It also should be noted that the endowment and foundation universe is comparatively small and can be dominated by the investment practices of the larger entities. The Money Market Directory included the following:

	<u>Number</u>	<u>Assets</u>
Corporate Plans	45,554	\$1,698 billion
Union	1,520	240 billion
Government	1,1678	1,239 billion
Endowment	816	116 billion
Total	49,057	3,293 billion

Mr. Swensen, of Yale, explains the comparatively high equity orientation by opining: "The tension between the goals of an endowment can be relaxed by investing for high rates of return. Hence, investment with an equity bias is the first tenet of endowment investment philosophy."

He, however, also emphasized the importance of diversification. For example, he notes the dismal performance of equities in the early 1930's and expresses a view that a heavy equity policy probably would not have survived. He rationalizes Yale's very heavy equity orientation by stating that: "Diversification without the opportunity costs of investing in fixed income can be achieved by identifying high-return asset classes that are not highly correlated with domestic marketable securities."

According to Mr. Swensen, Yale's Asset Allocation and Expected After Inflation Return Targets were:

<u>Asset Class</u>	<u>Target Weight</u>	<u>Expected After-Inflation Return</u>
U.S. Bonds	15.0%	2.0%
U.S. Stocks	22.5%	6.0%
Non-U.S. Stocks	12.5%	6.0%
Private Equity	20.0%	14.0%
Absolute Return	20.0%	7.0%
Real Estate	<u>10.0%</u>	<u>6.0%</u>
Total	100.0%	7.2%

Yale's spending rate was recently raised from 4.5% to 4.75%.

Yale's investment policy, based on Callan's experience, is significantly more aggressive than most. However, other major educational endowments such as Harvard and Stanford also employ comparatively aggressive strategies.

Major endowments have been particularly receptive to the use of "private equity" (including leveraged buyout, management buyout, and venture capital funds). Many have been receptive to non-traditional investment strategies such as "merger" arbitrage, investment in distressed securities, and "market neutral" investment approaches.

Obviously APFC cannot currently pursue investment approaches utilized by these educational endowments. Current law limits overall equity exposure and precludes the types of arrangements that are the norm for investing in private equity. Statute also precludes the use of many of the instruments and techniques that are employed in the absolute return category (e.g., short selling, futures, options, and derivatives).

Comparison of the Impact of Distribution Policies on Growth and Spending

The long-term returns achieved from equity and high quality fixed investments are well known and documented. In sum, equity investments have far outpaced fixed investments, albeit with greater volatility.

What is less well documented but critically important is the impact of alternative distribution policies on long run growth.

To examine this question, in conjunction with staff, we developed two alternative distribution rules. They were:

1. 1/2 of average five year total return is distributed.
2. 4% of average five year market value is distributed.

Using Ibbotson Associates return data, we then modeled three alternative investment policies. The policies were:

1. 50% equity (S&P 500) and 50% bonds (Salomon Brothers High Grade Long-Term Corporate)
2. An aggressive policy (70% equity), and
3. A conservative policy (30% equity).

For each of the three investment policies, we calculated market values and annual distributions (spending). For each, we used data from 1926, for the past 40, 30, 20, and 10 year periods. We considered the multiple timeframes to minimize the risk of drawing conclusion that had a particular time period bias.

The distribution rule based on 1/2 of five year average earnings is similar to, but different from, APFC's actual distribution pattern. Your distributions are based on "realized" return not total return. Thus, the distributions associated with our model are more volatile than those that you have actually observed. However, in a true economic sense, the total return approach utilized is very meaningful.

Data limitations precluded the use of international equities, real estate and broader measures of the bond market. Inclusion of these additional asset categories should dampen overall observed volatility but not distort the conclusions of the analysis.

Graphs portraying the results of the analysis for the 50/50 policy follow this text. Results for the aggressive and conservative policies are presented in the Appendix.

Review of the output demonstrates the following conclusions:

1. The policy of distributing half of average return erodes the growth in assets relative to the market value based distribution policy when returns are high. As should be expected, the greater spending in these periods does not allow as much reinvestment to take advantage of subsequent market returns.
2. The second conclusion is that the return based distribution policy leads to more volatile cash flows than the market value policy.
3. Whichever policy produces lower initial spending produces greater subsequent market values (growth). On balance, the 4% spending policy produced lower spending than the half return policy, and, therefore, fund growth was greater with the market value spending approach.

Several other points pertaining to the historic analysis are noteworthy. Regardless of spending policy, the asset growth and long-term spending are greater with higher equity commitments. At the 50/50 investment policy, there were extended periods where the half return policy produced higher market values. However, for the entire period and for the 40, 30, 20, and 10 year periods, the market value distribution approach resulted in higher ending market values. Market value differences were greater with the more aggressive policy and mixed with the more conservative investment policy.

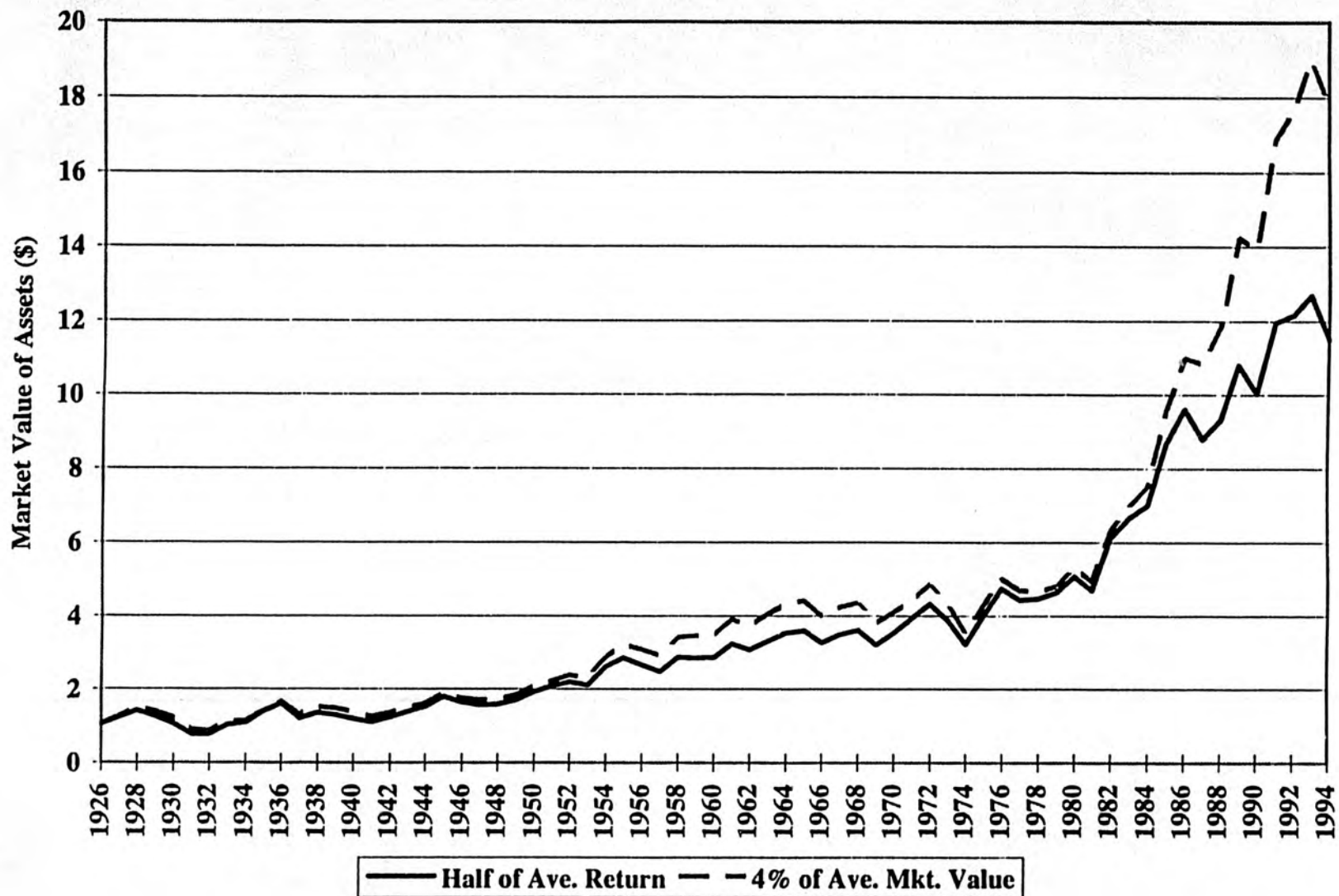
Technical Note: In order to develop spending comparisons in the initial five years for each comparison, we used averages of increasing duration. Spending in the initial year was based on the first year market value, in the second year on the average of the first and second year market values, and so forth. In order to make the comparison apples-to-apples, we followed the same procedure for calculating the average returns. These assumptions have the greatest impact on shorter timeframes by introducing additional time period bias.

Other Conclusions

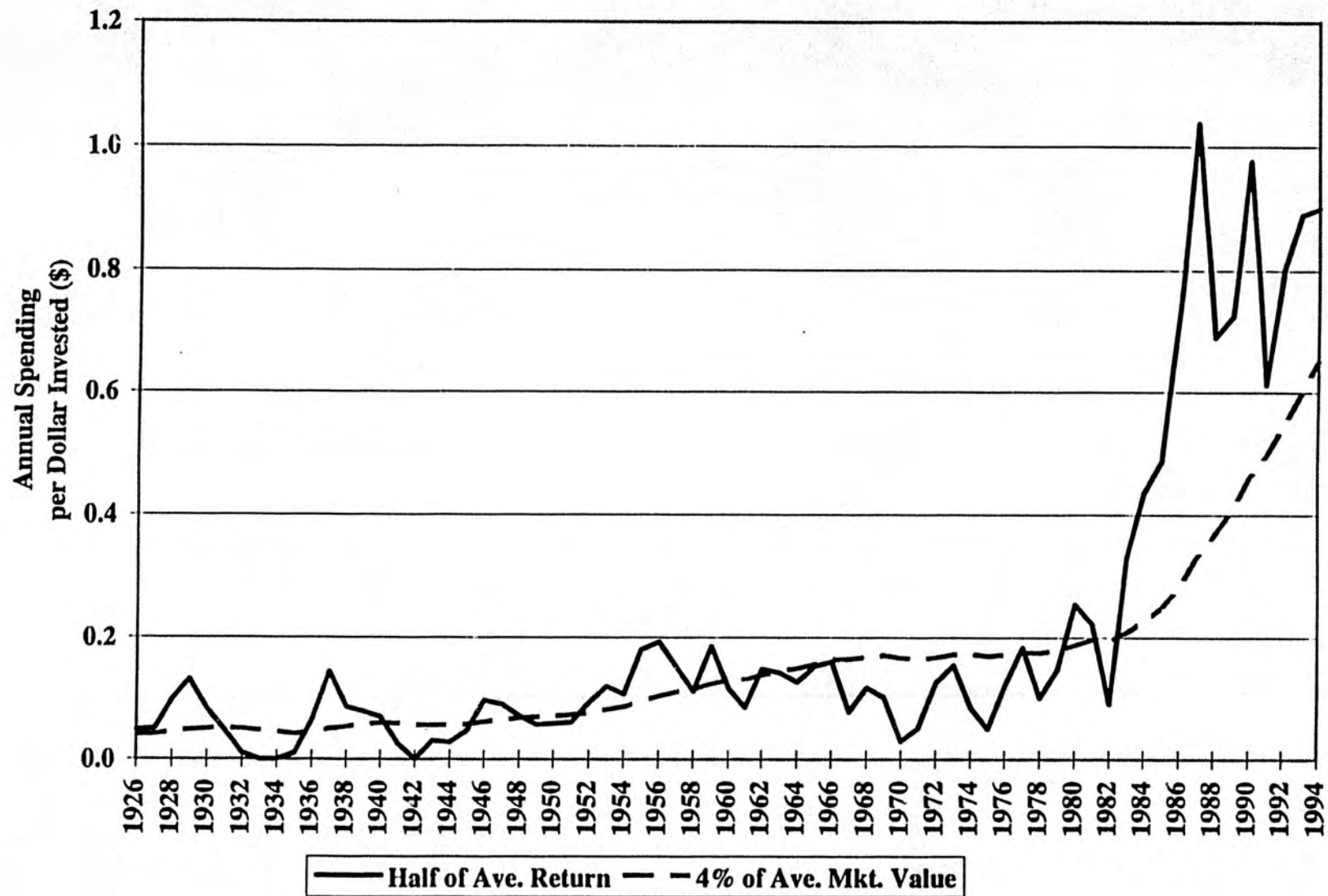
While not apparent from the analysis, we believe the following additional observations are important:

1. Long run returns have been positive, thus, lengthening the period used for averaging (e.g., from 5 to 7) tends to reduce the effective distribution. Lower distributions result in more rapid asset growth. Conversely, shortening the averaging period would result in larger distributions, thereby retarding asset growth.
2. The magnitude of the impact on asset growth would vary significantly with the investment policy and the time period considered.

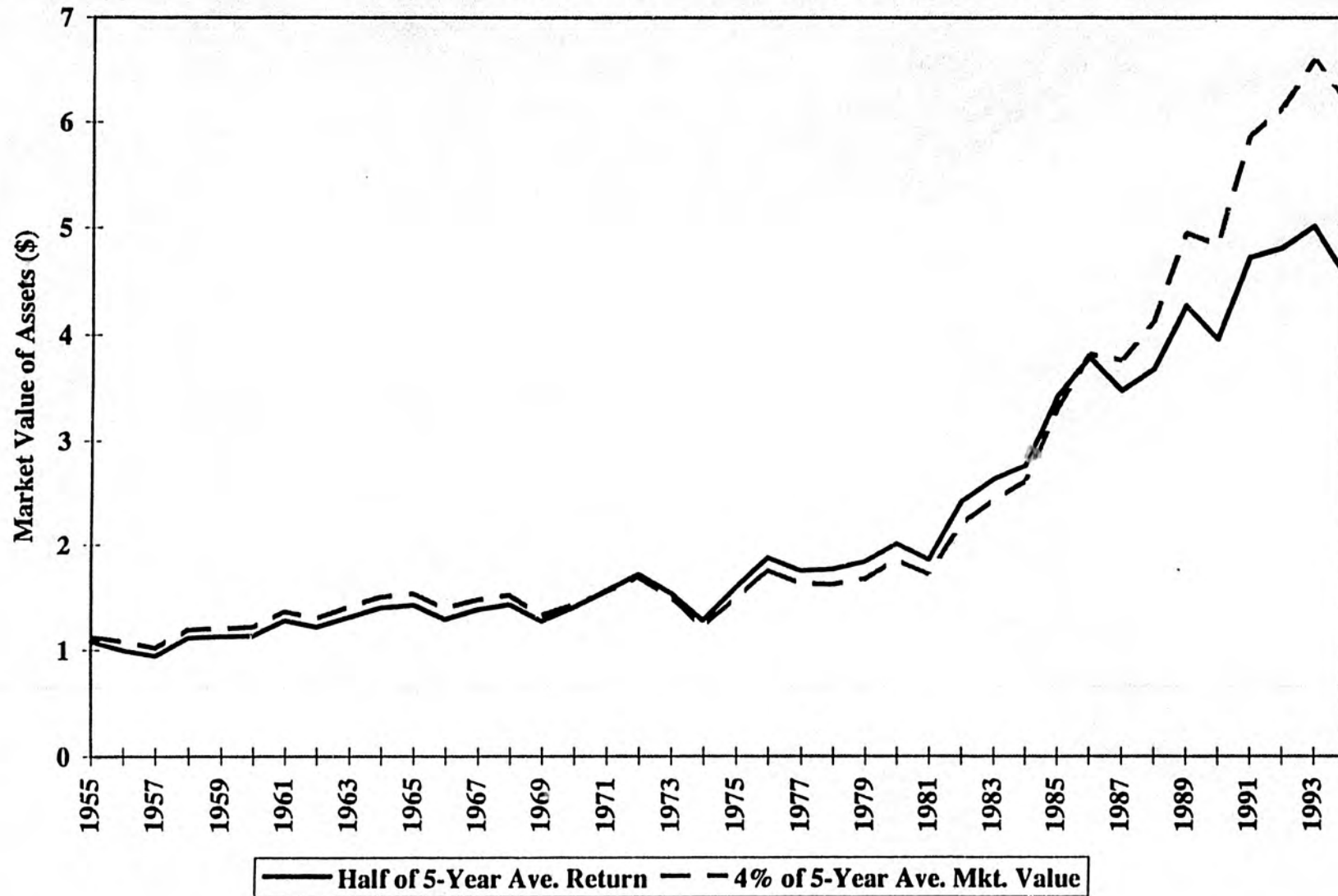
Market Value of Assets Comparison For 50/50 Allocations



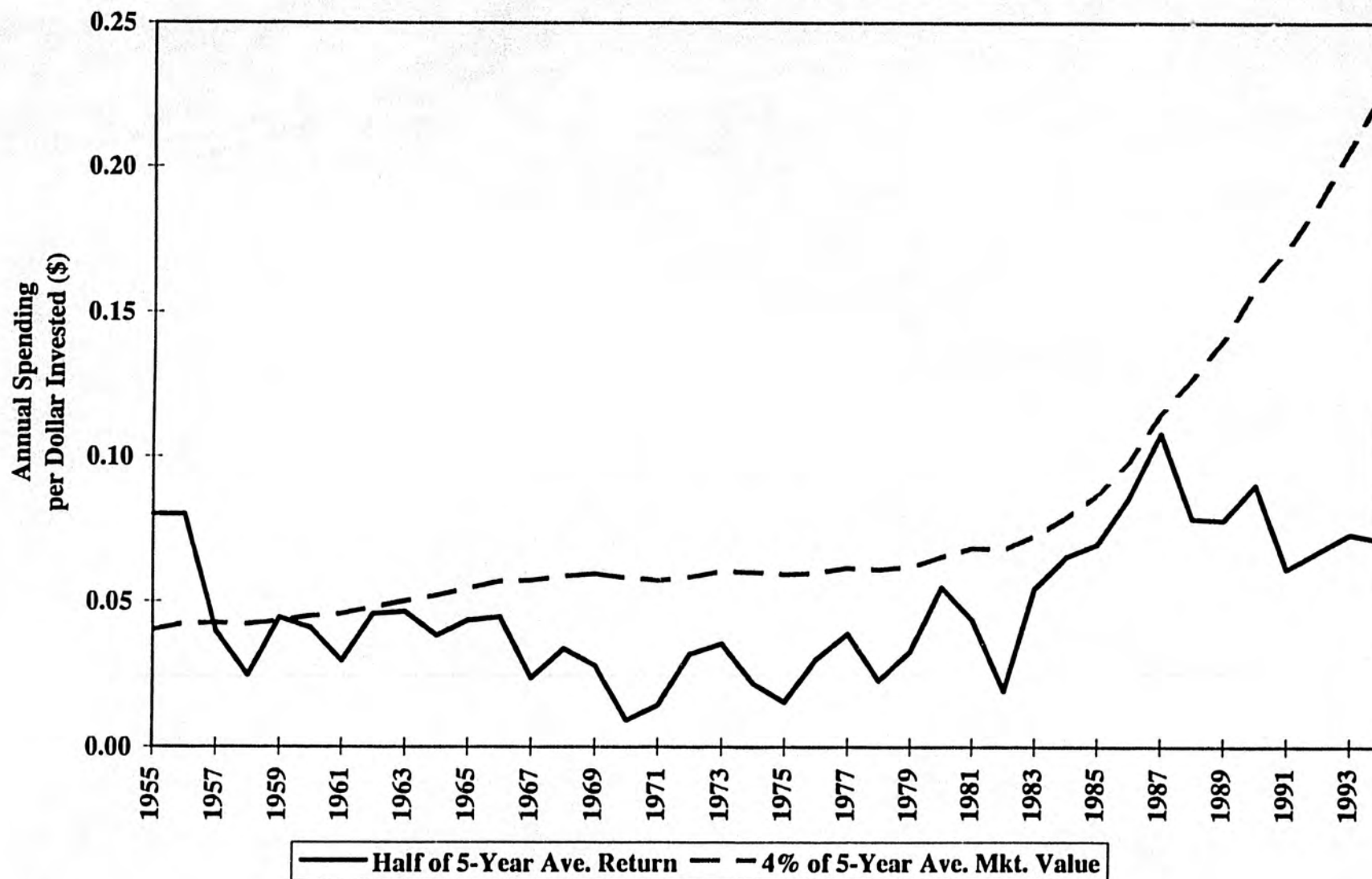
Spending Comparison For 50/50 Allocations



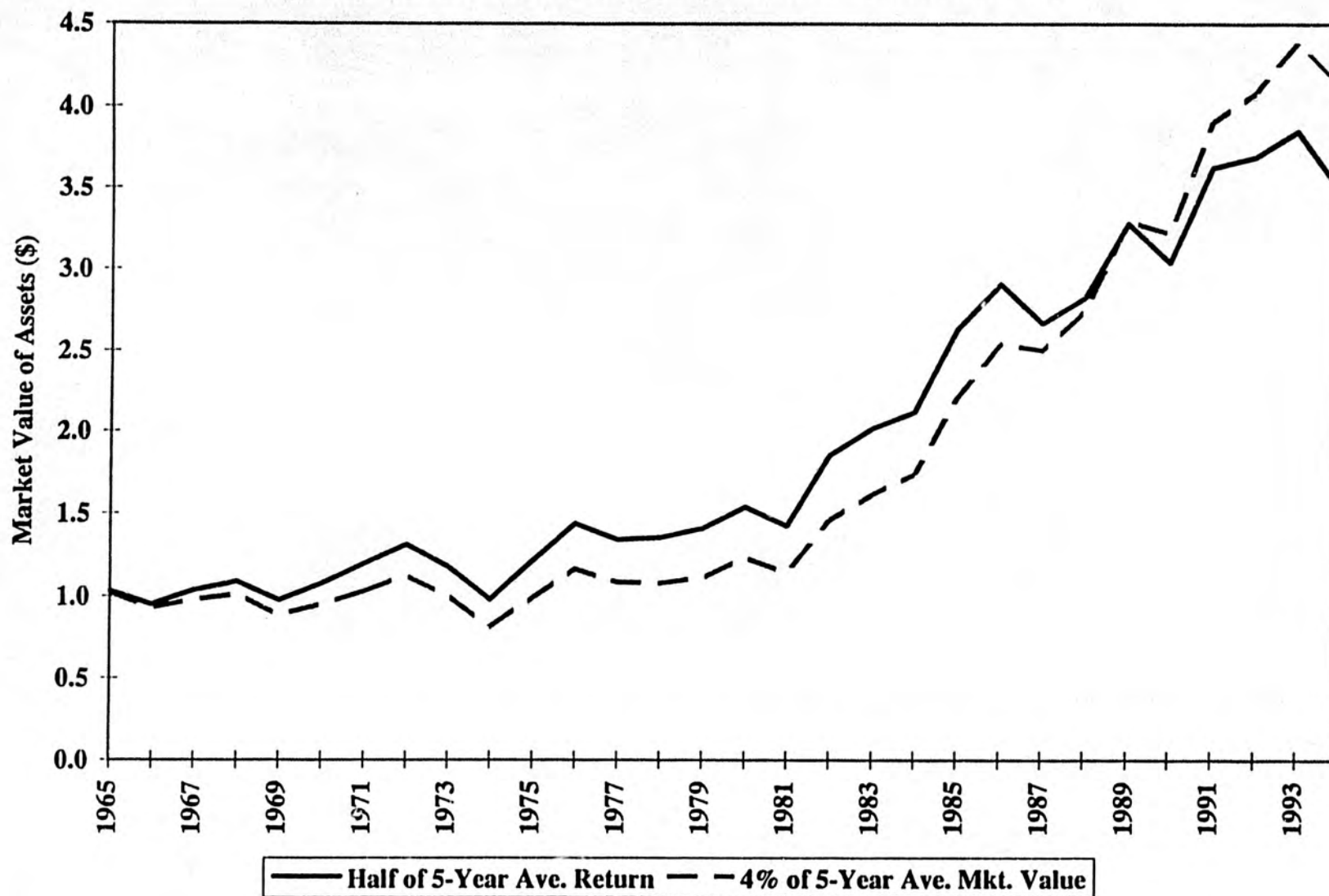
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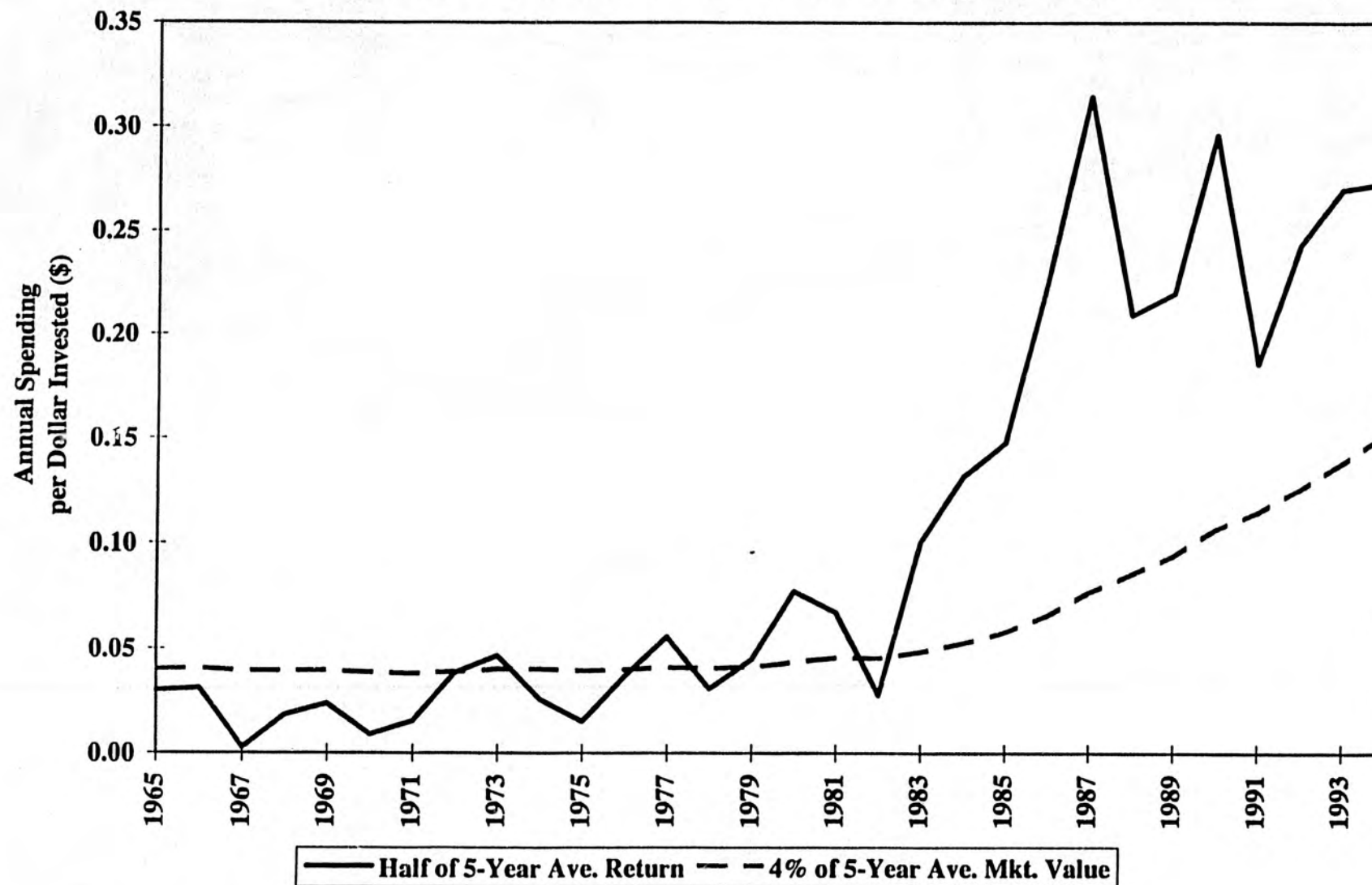
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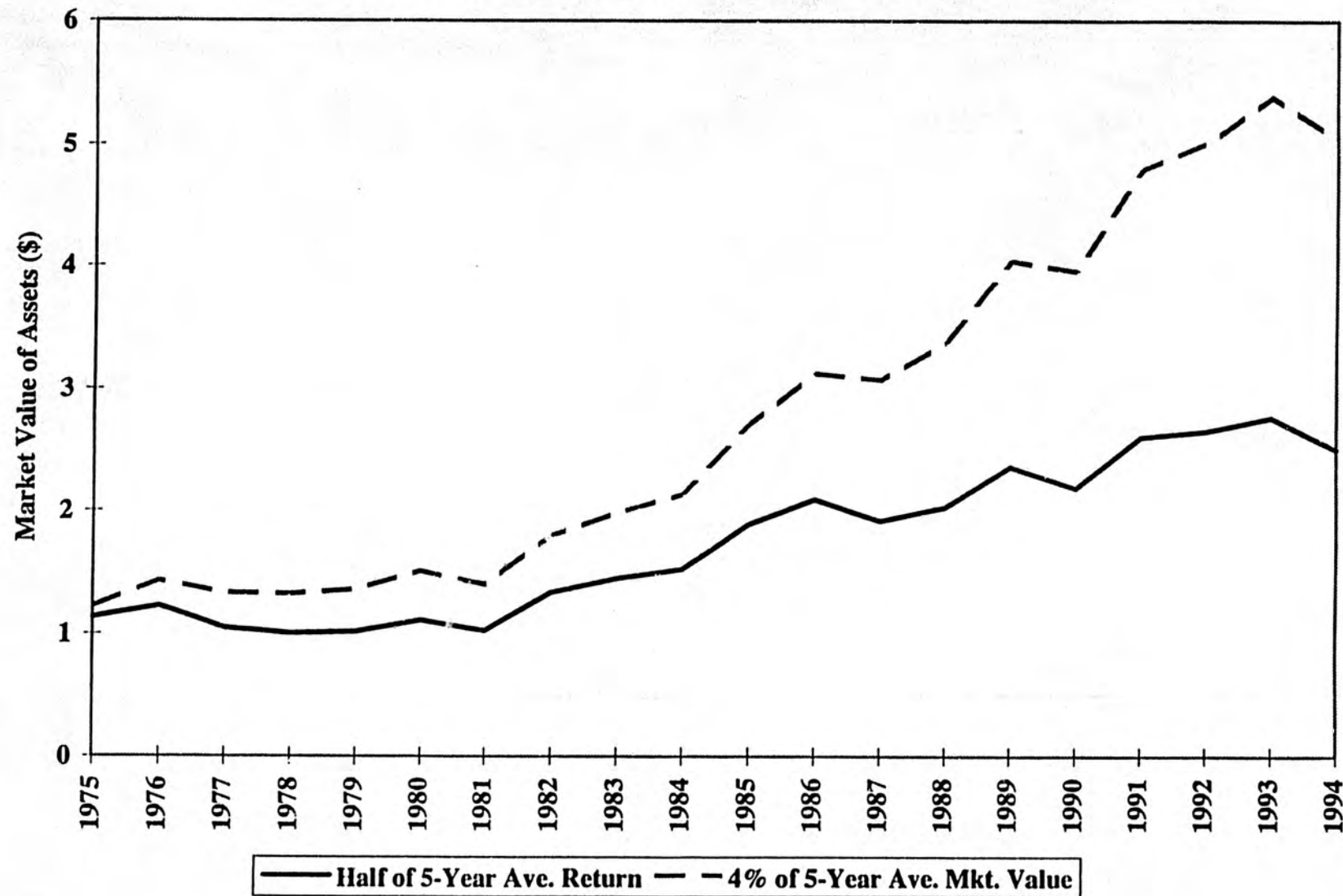
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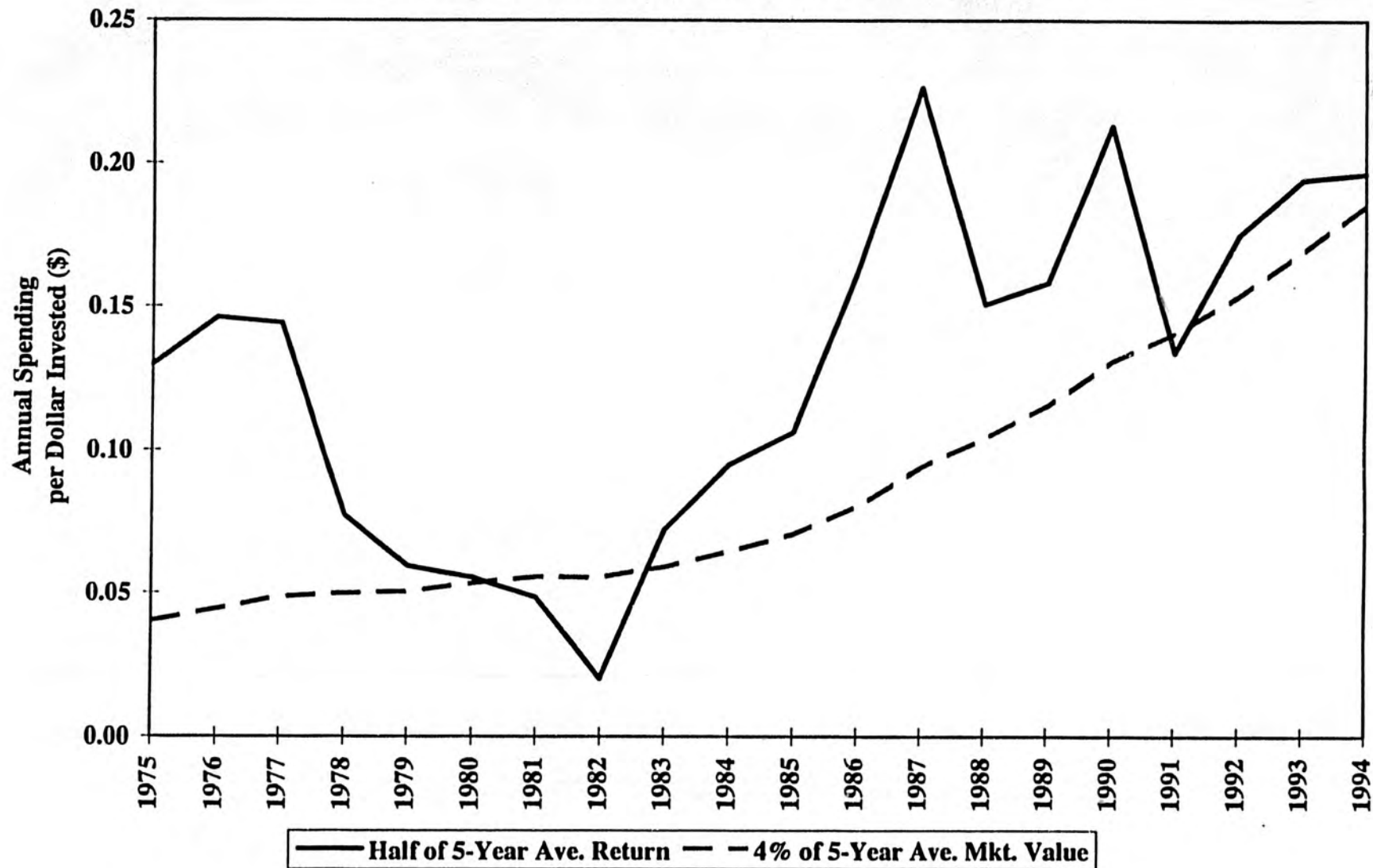
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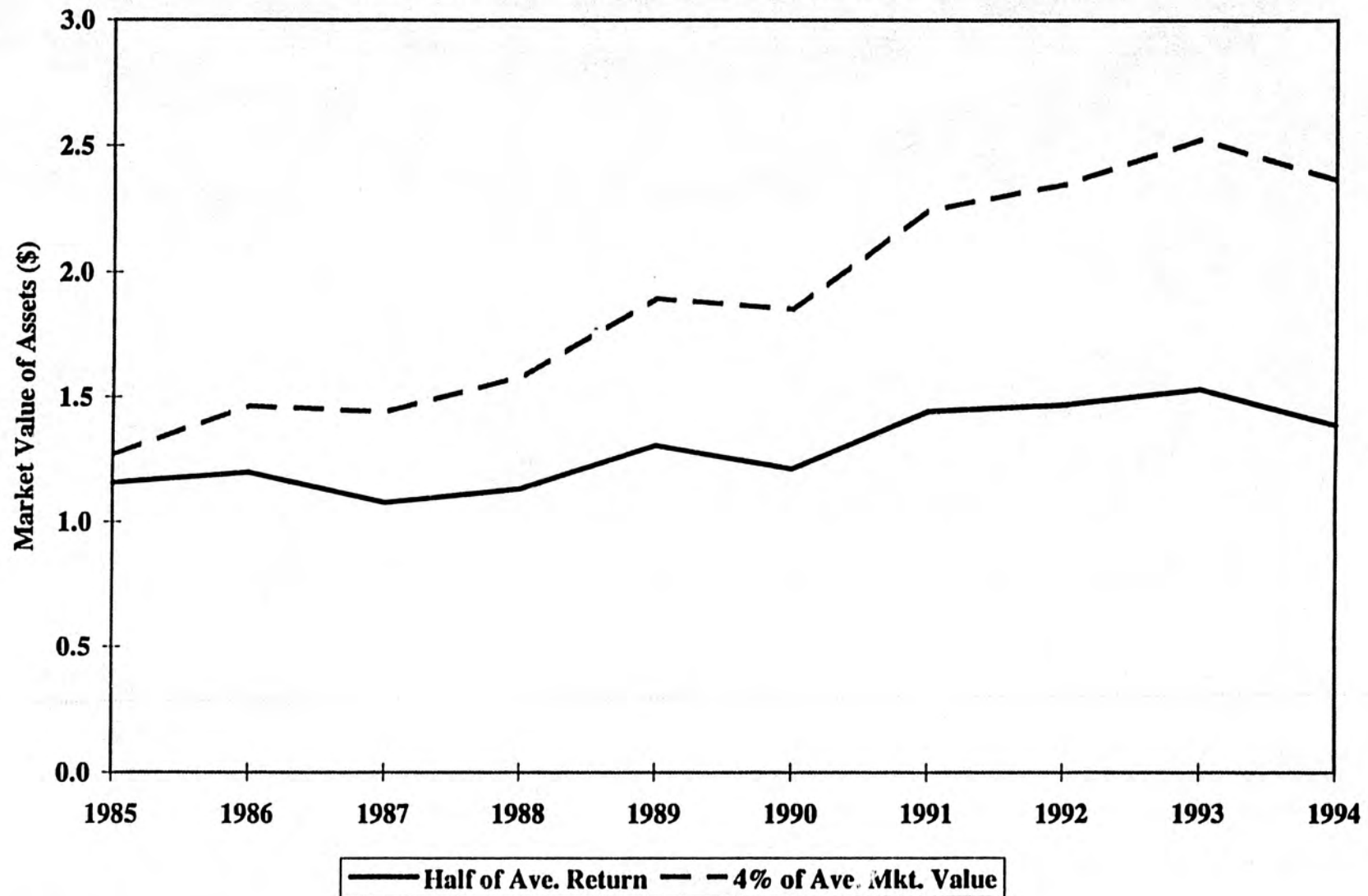
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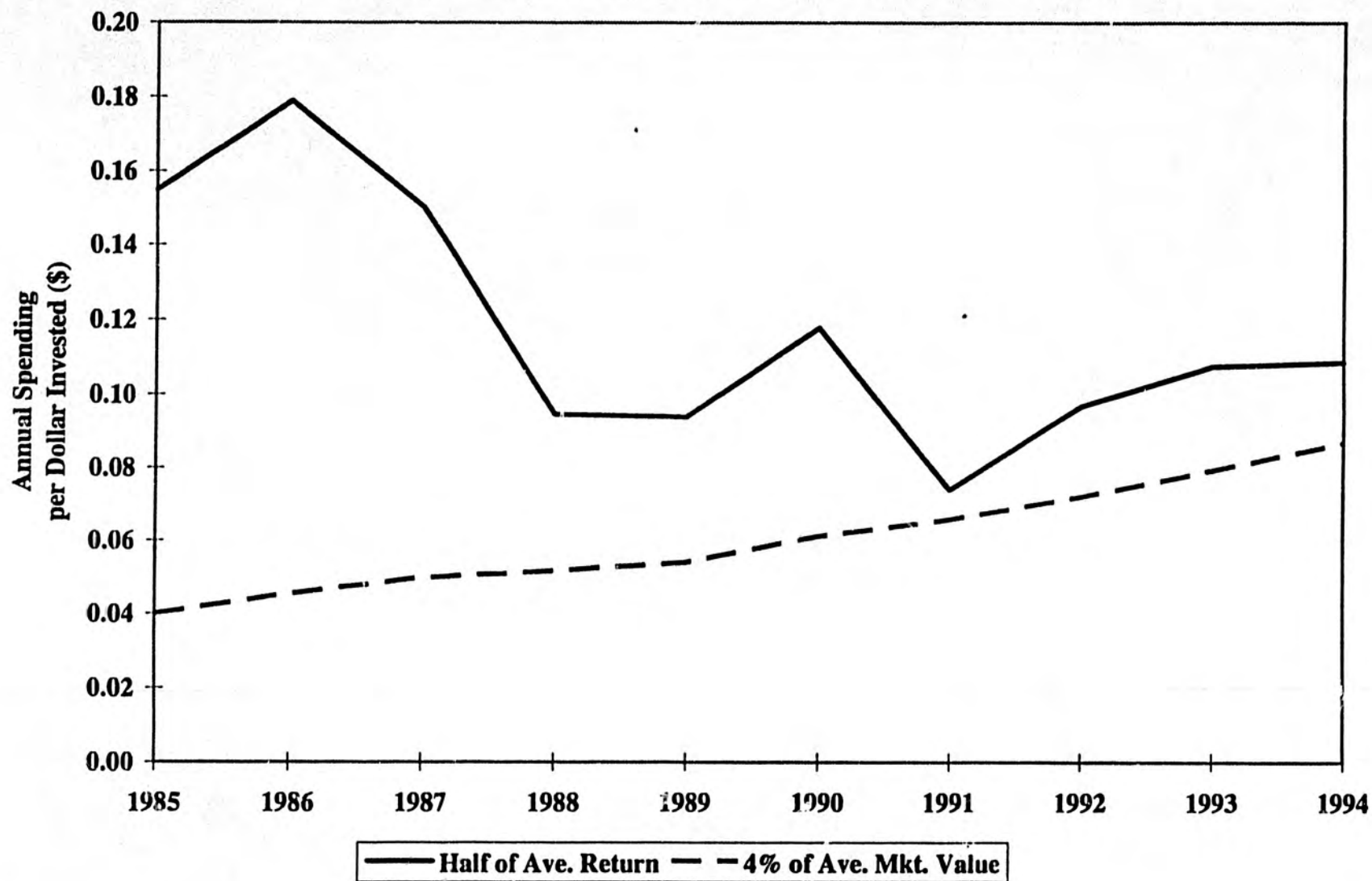
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Market Value of Assets Comparison For 50/50 Allocations 10 Years Ended 12/31/94



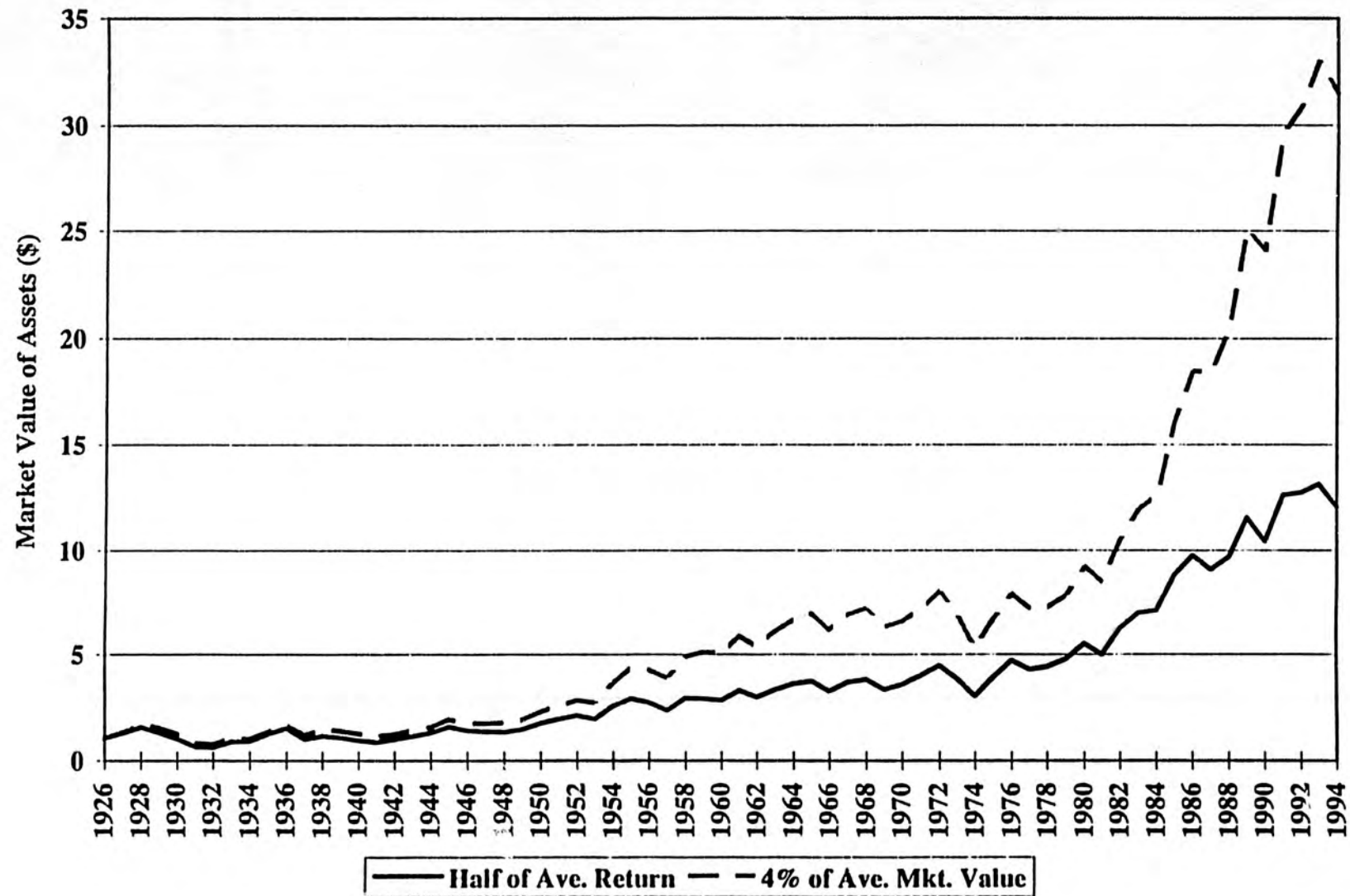
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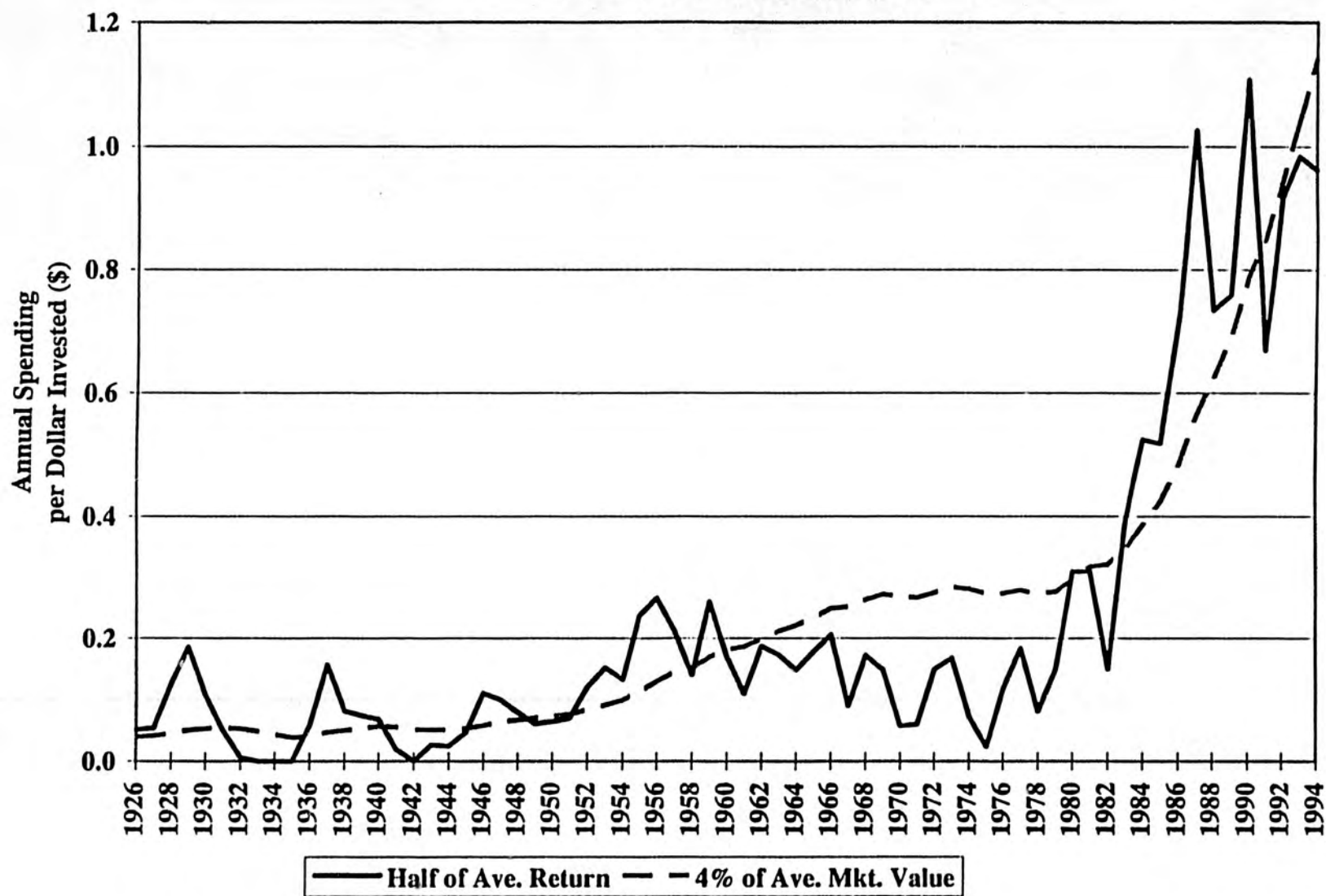
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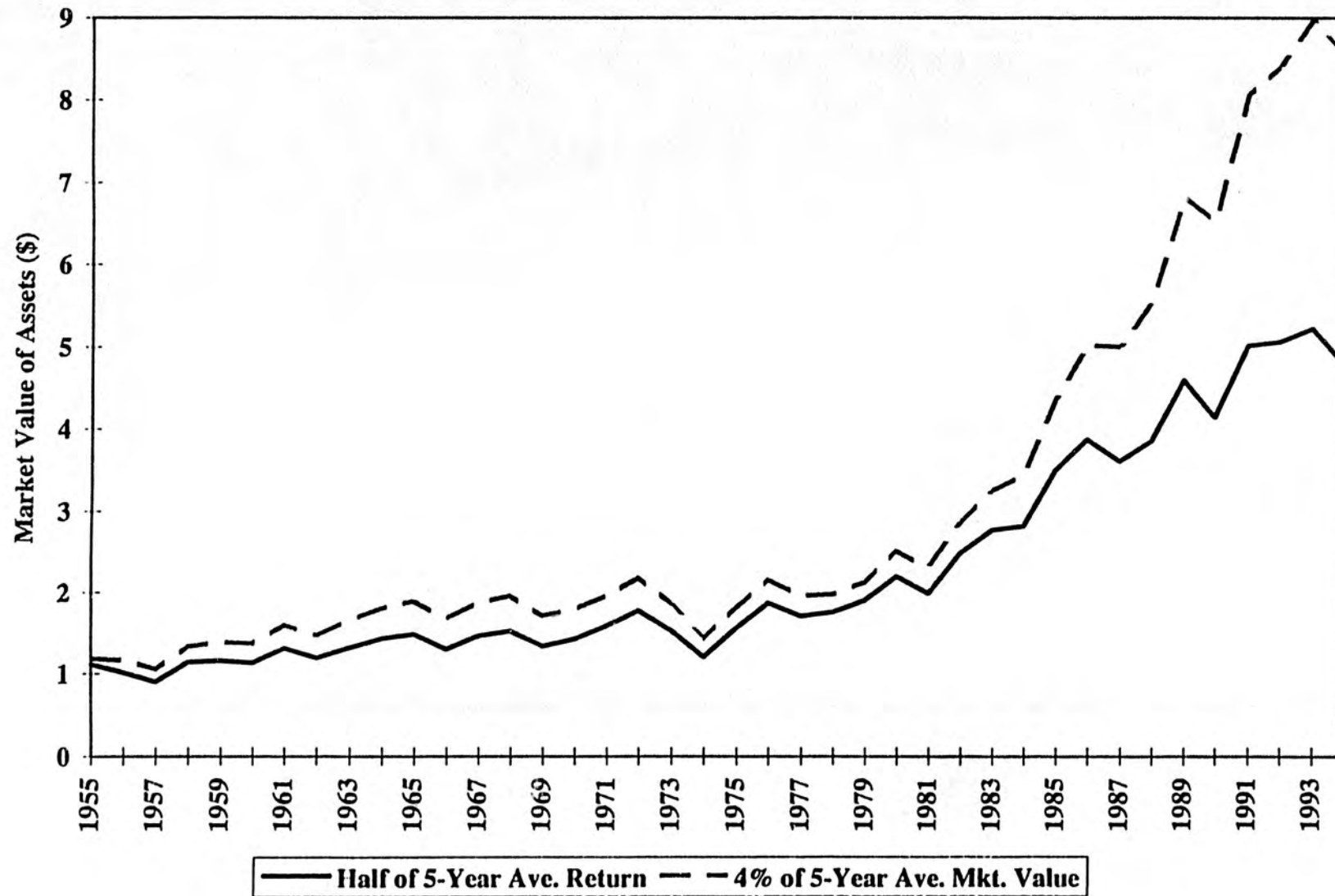
Market Value of Assets Comparison For 70/30 Allocations



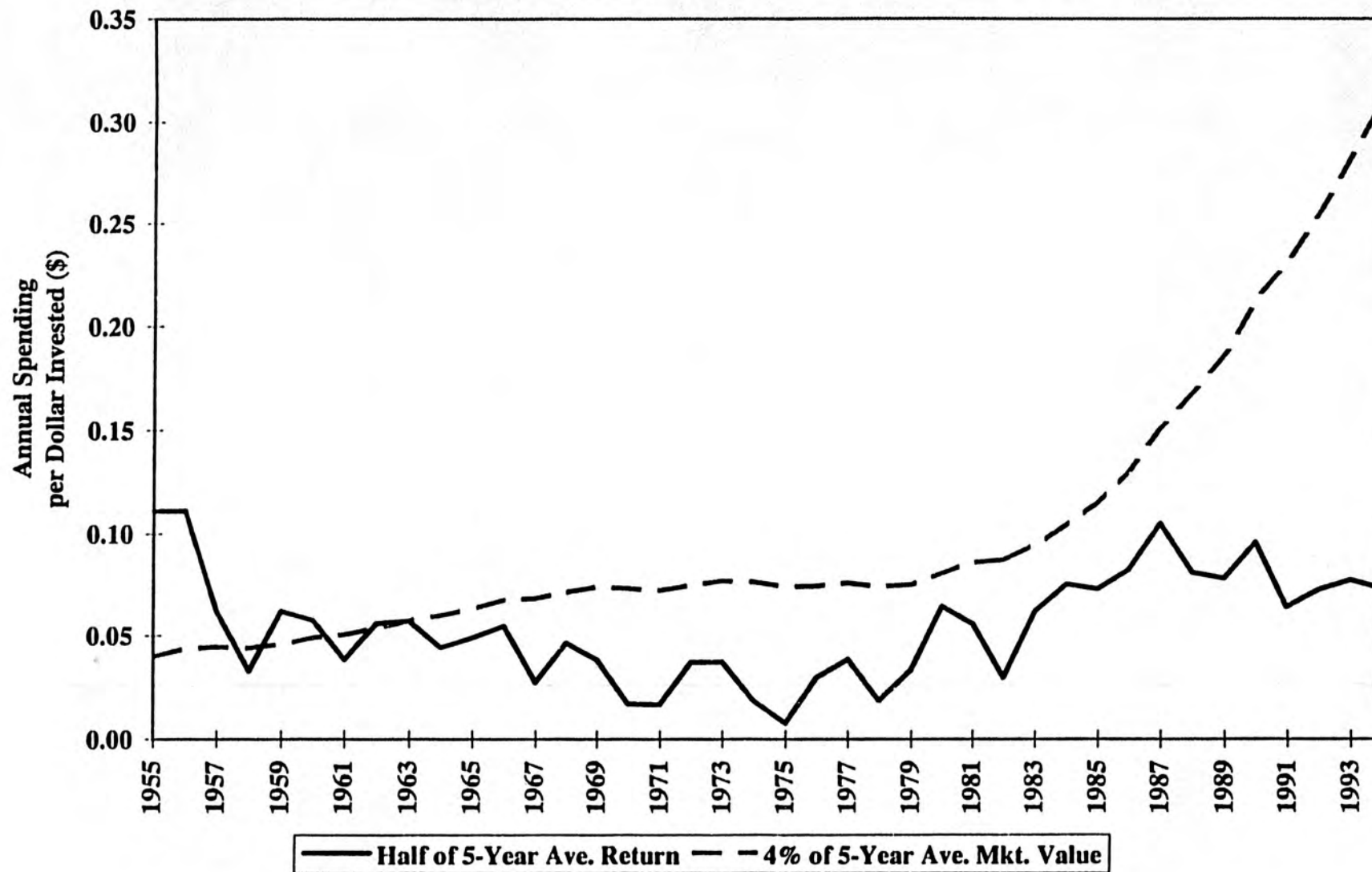
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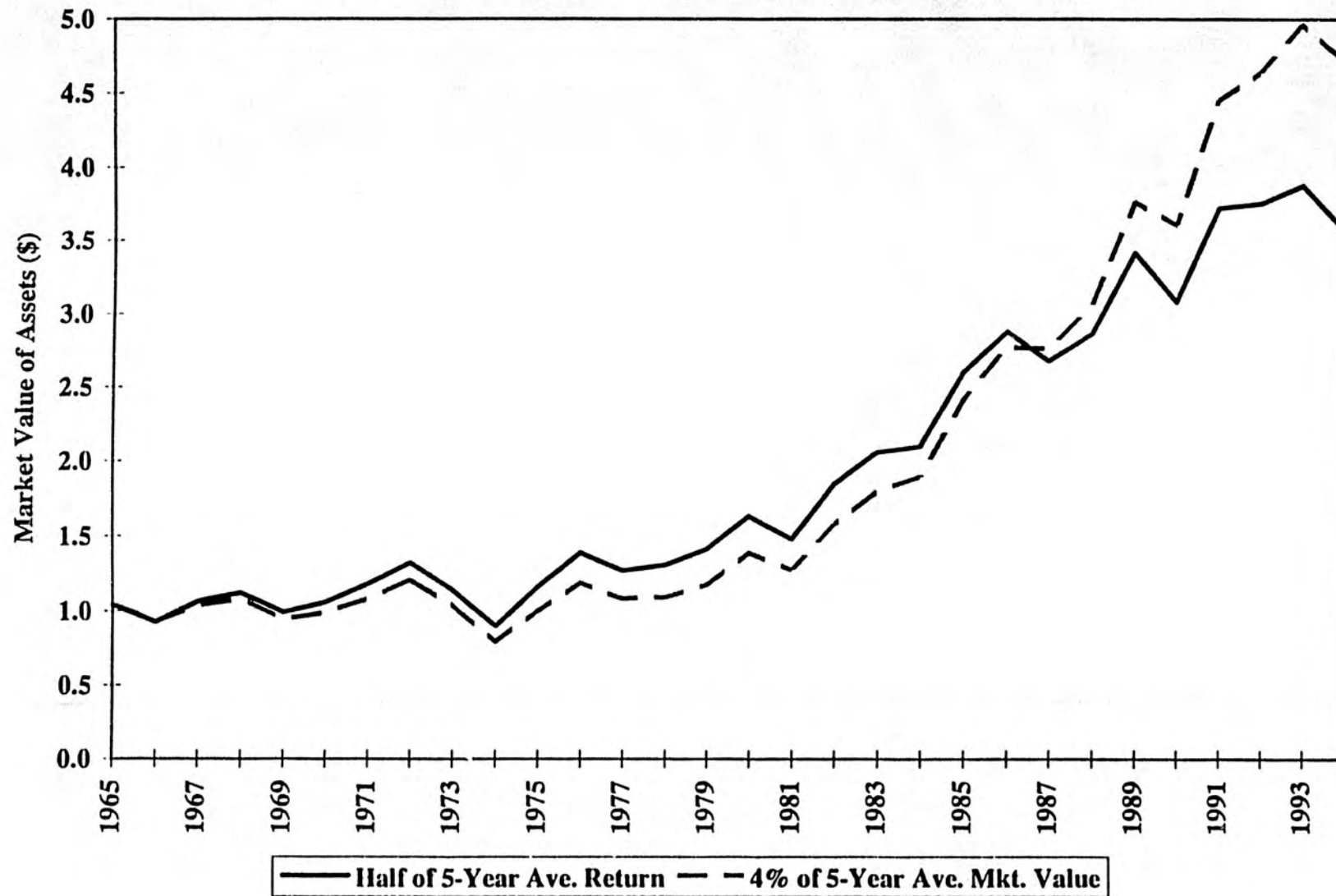
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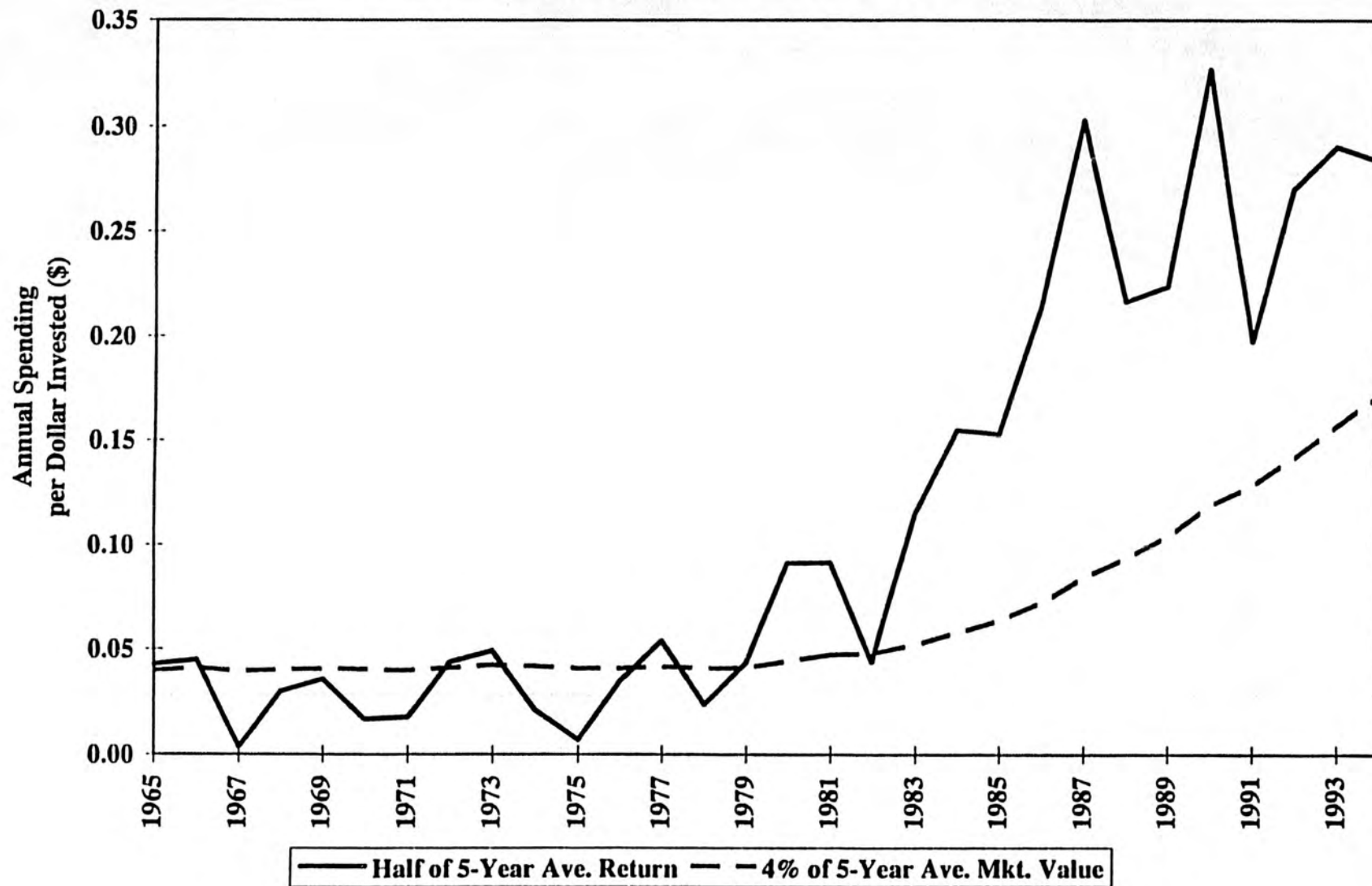
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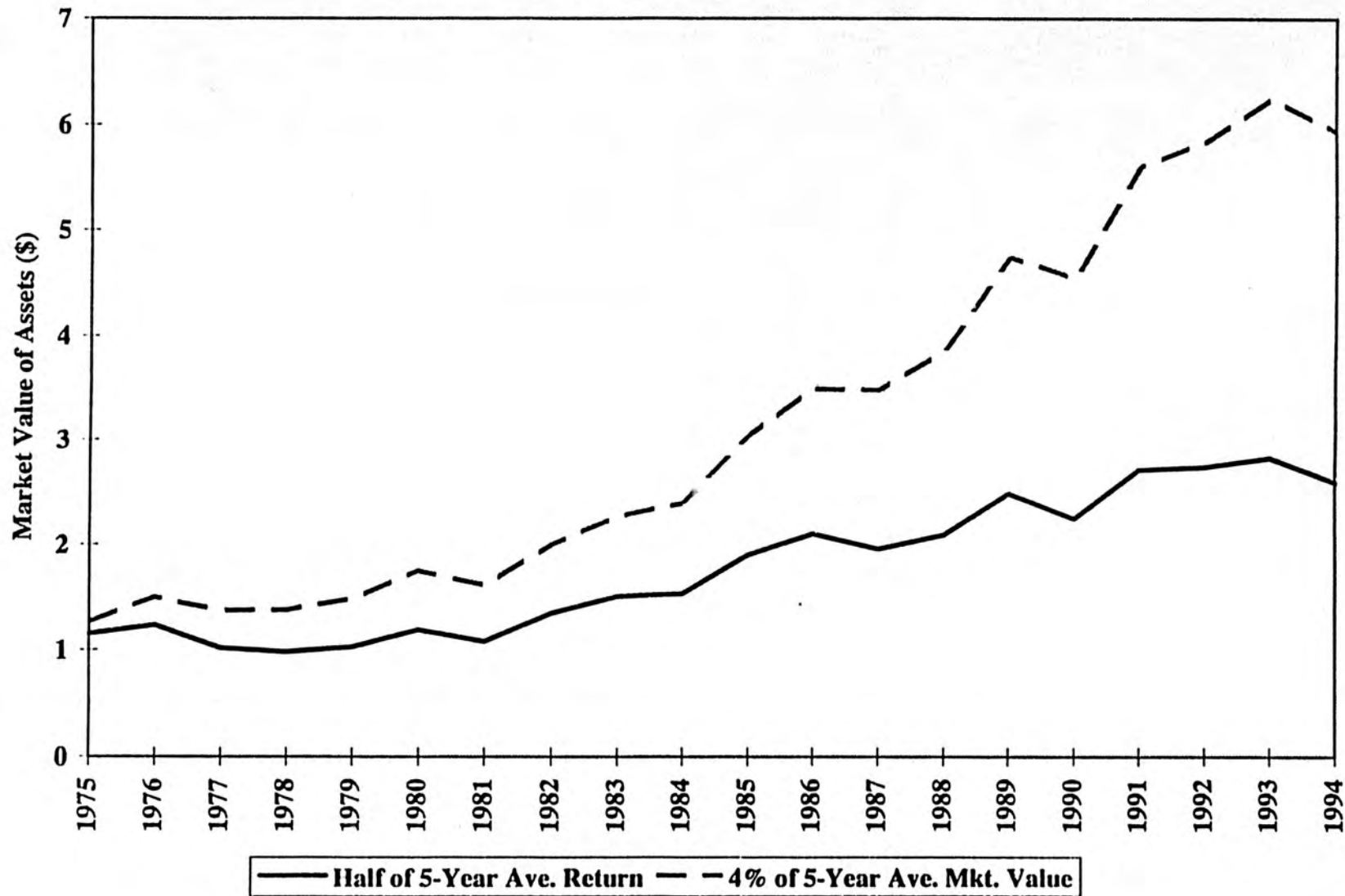
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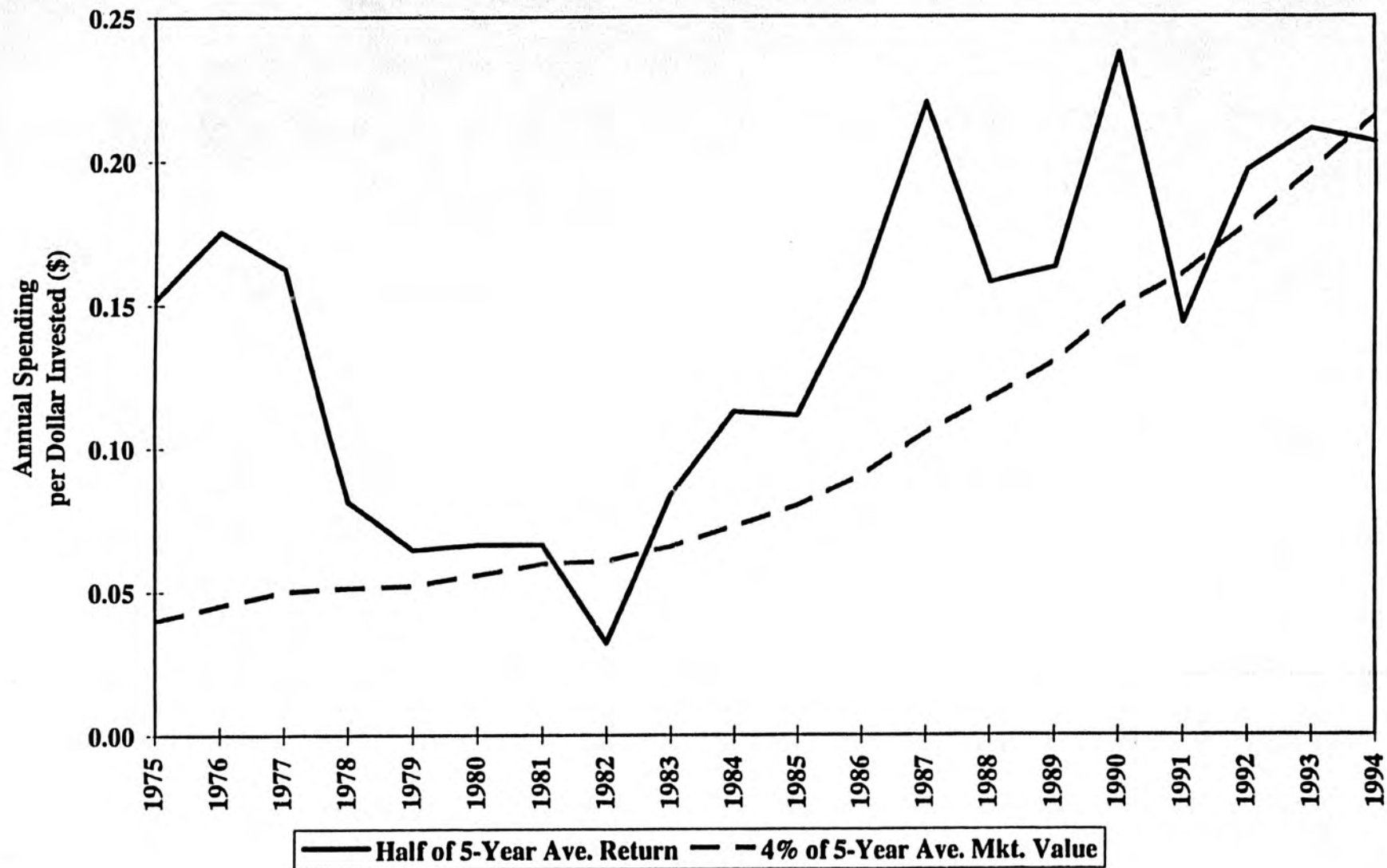
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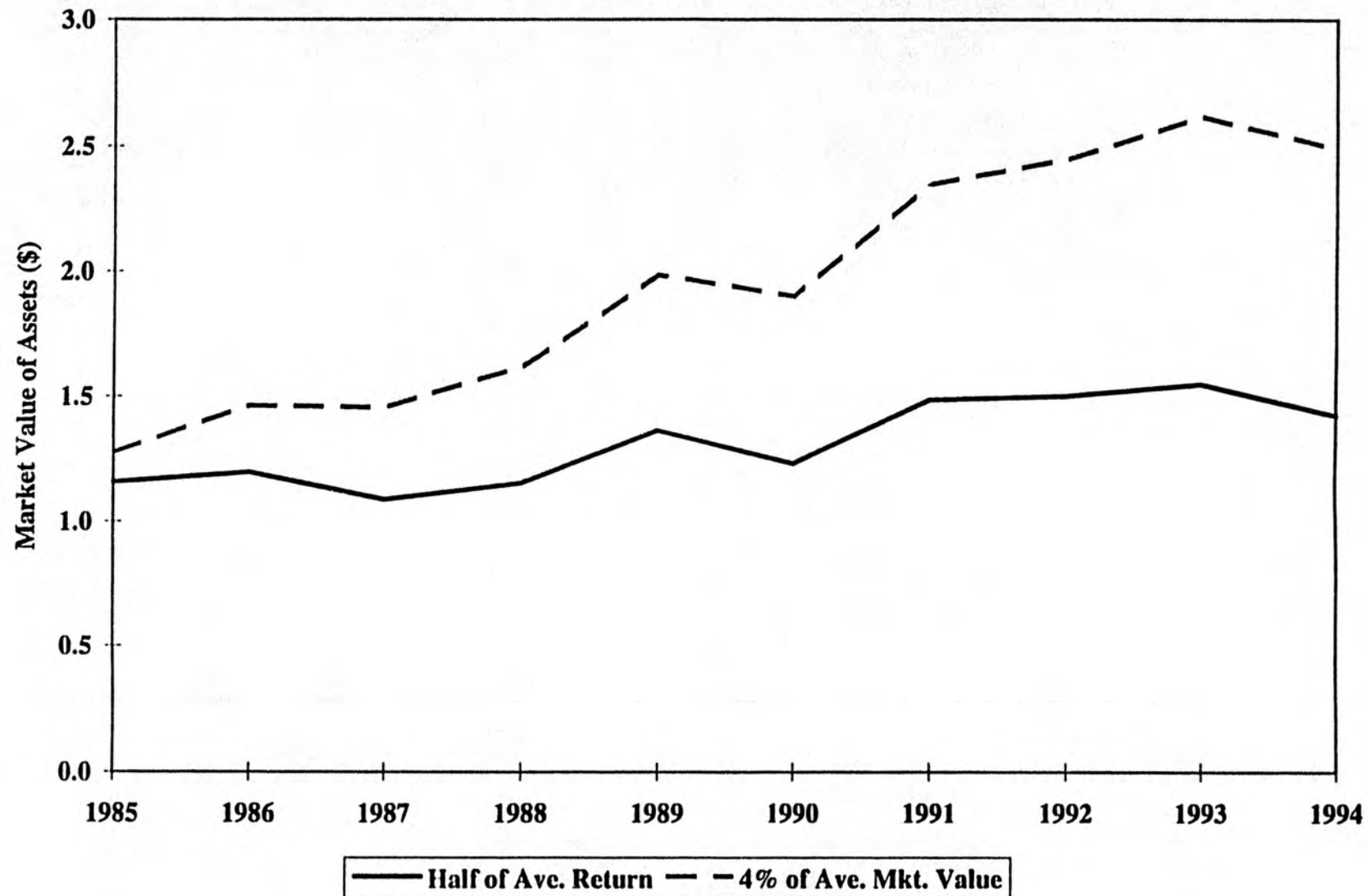
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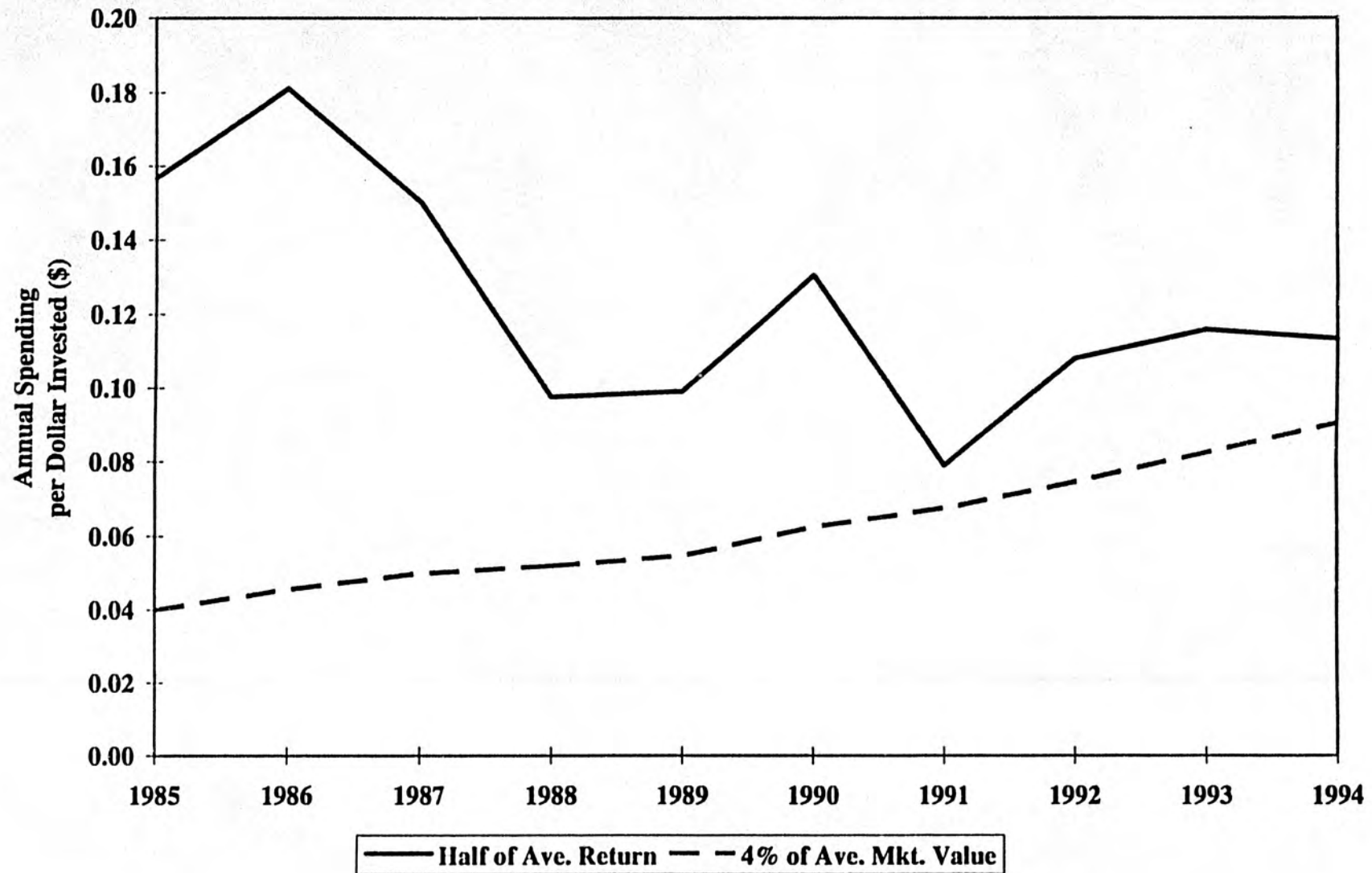
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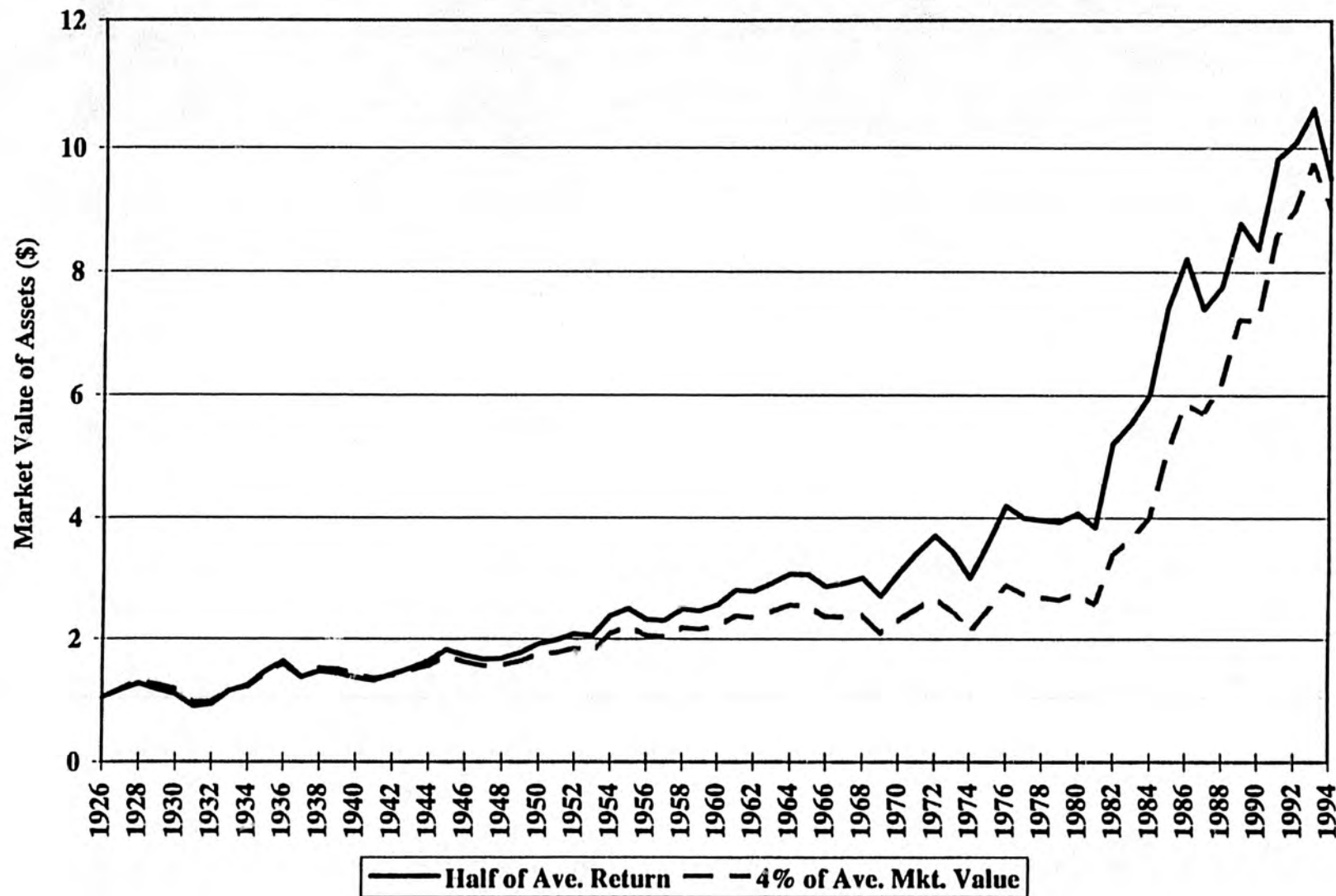
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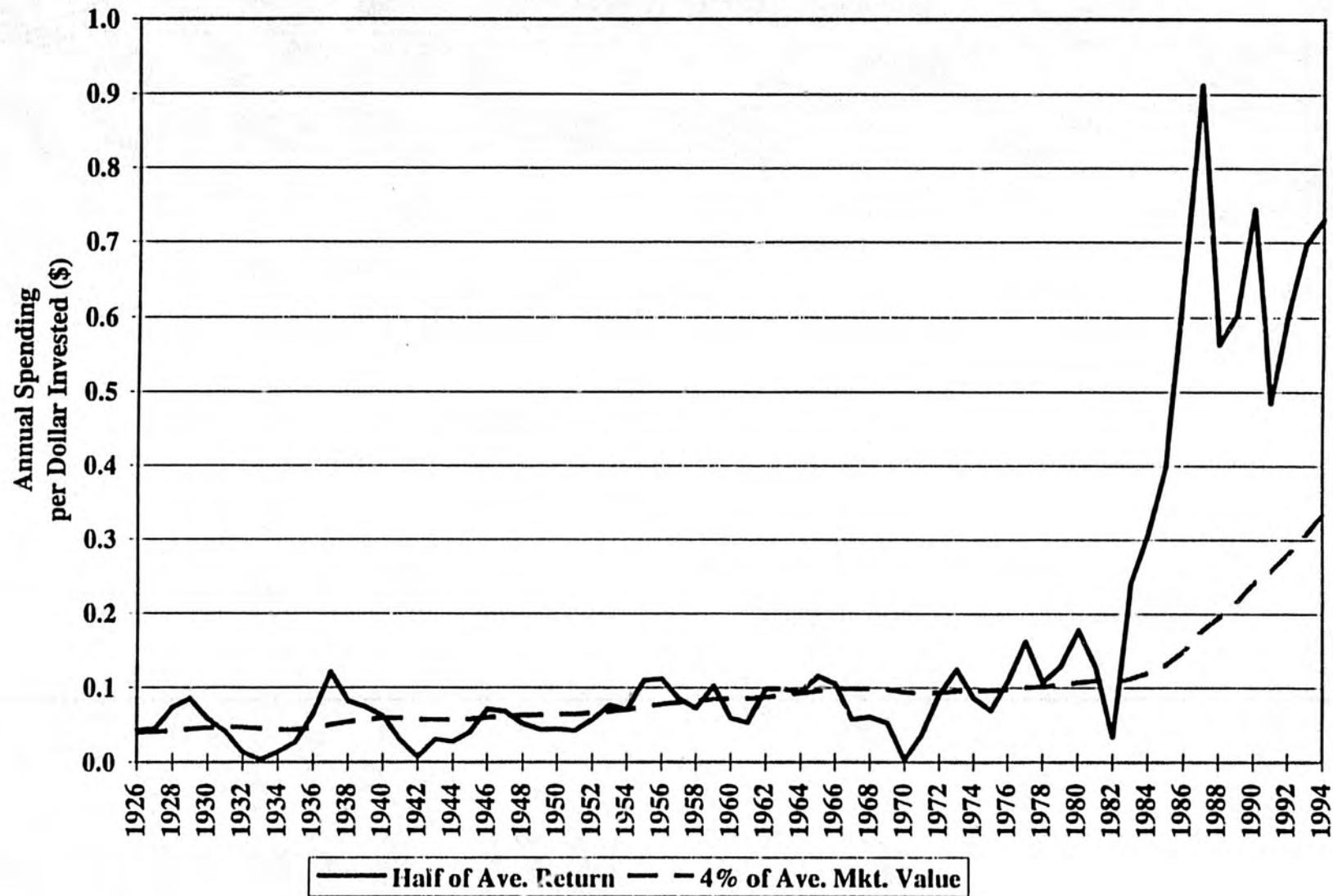
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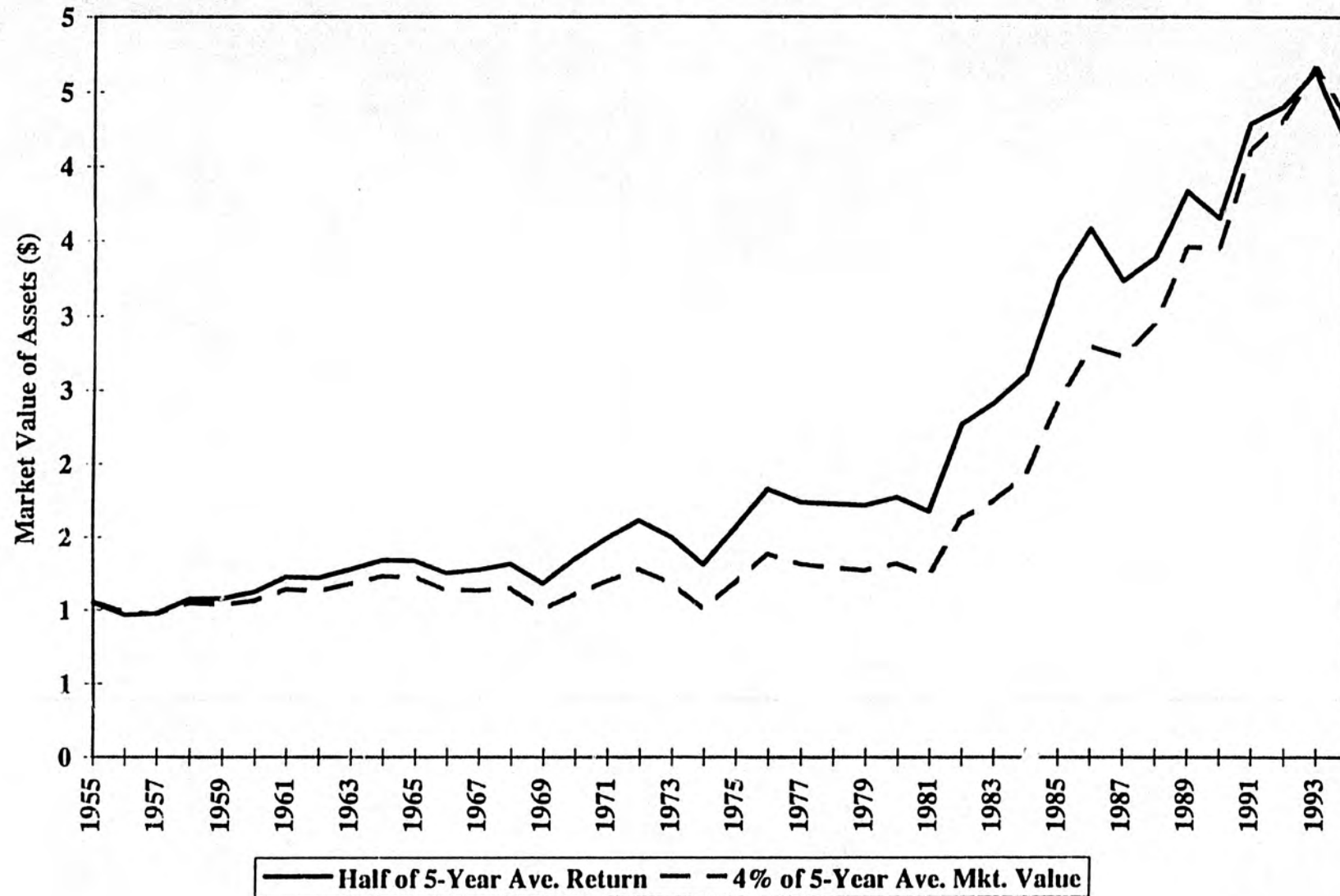
Market Value of Assets Comparison For 30/70 Allocations



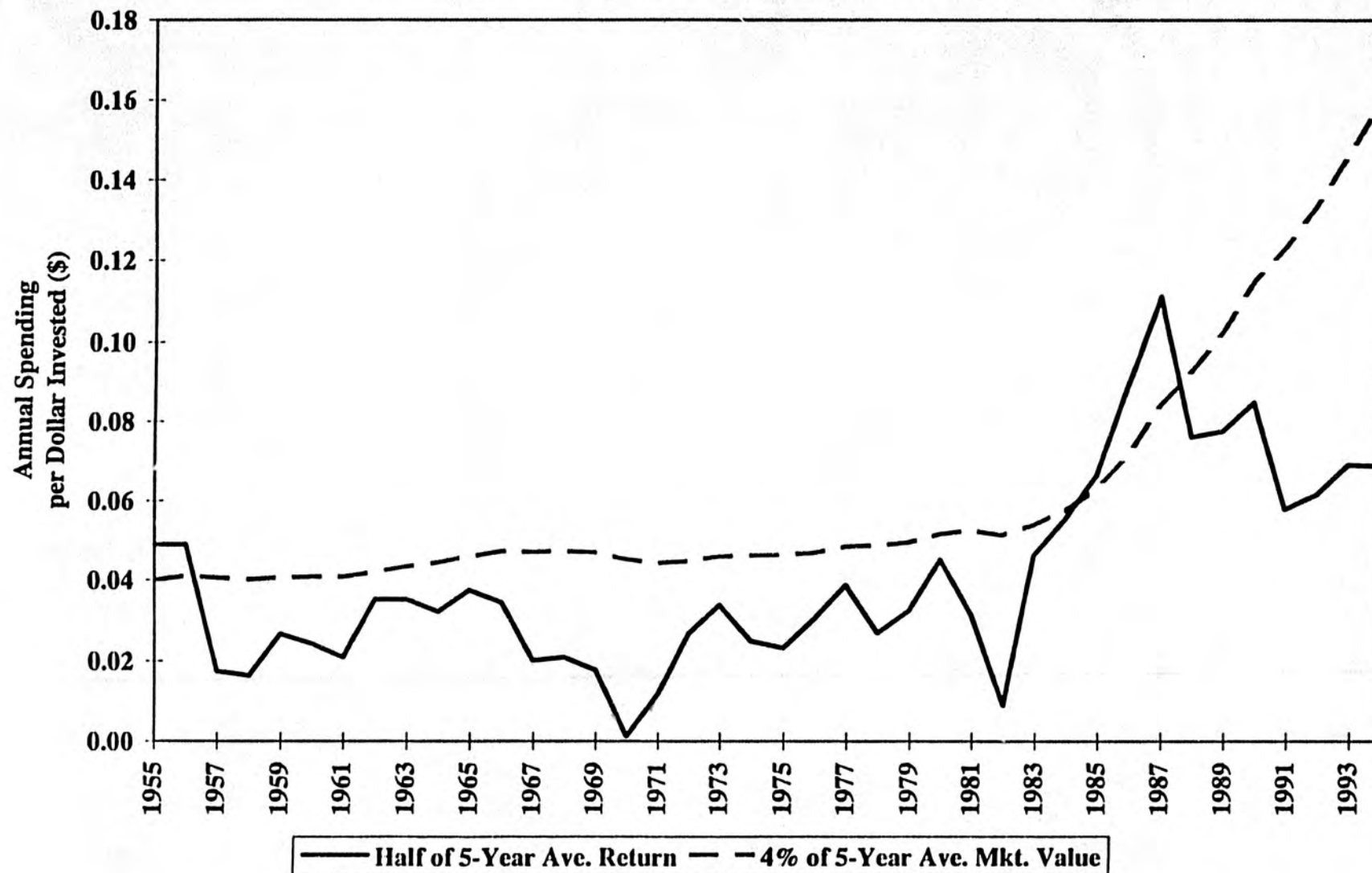
Spending Comparison For 30/70 Allocations



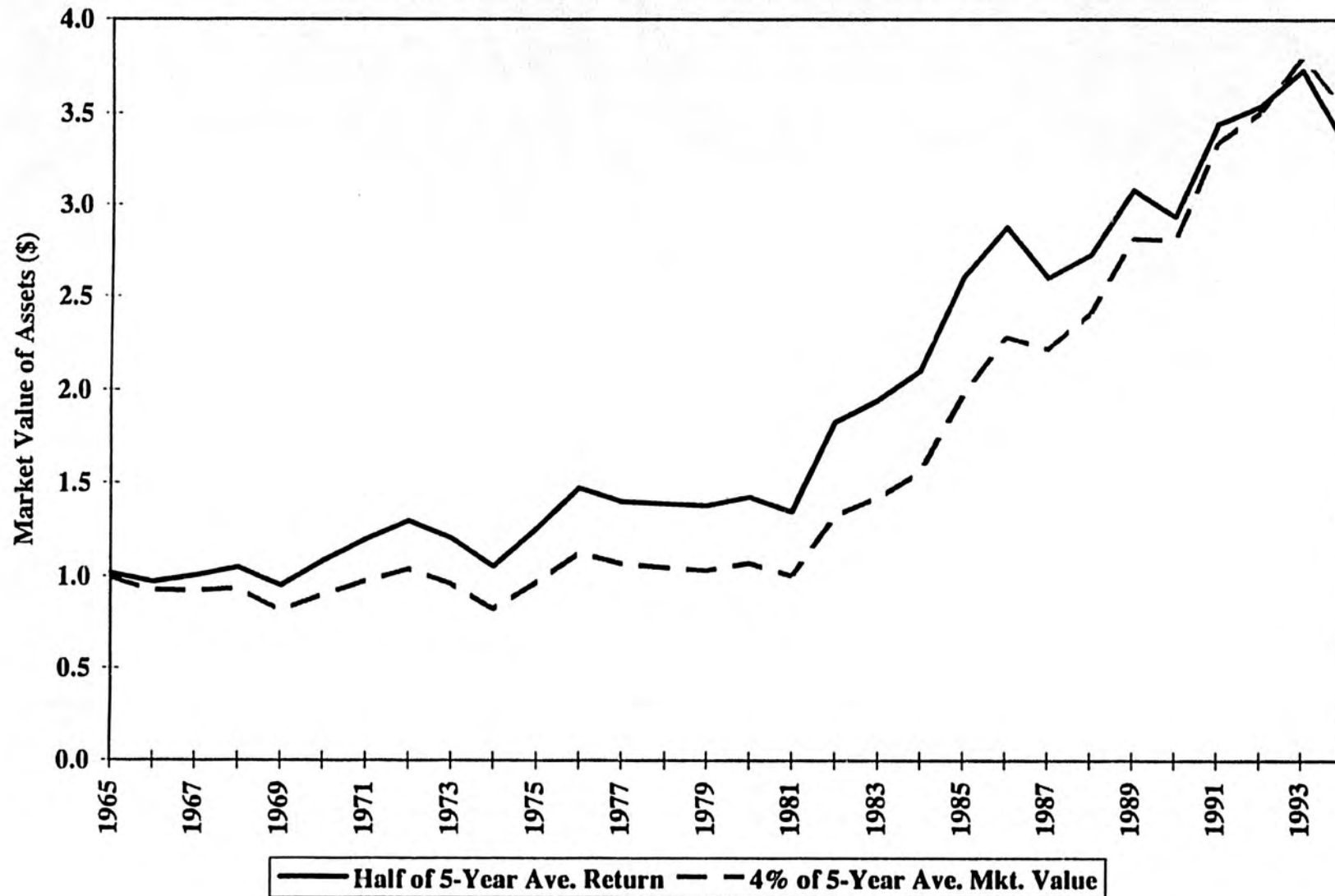
Market Value of Assets Comparison For 30/70 Allocations 40 Years Ended 12/31/94



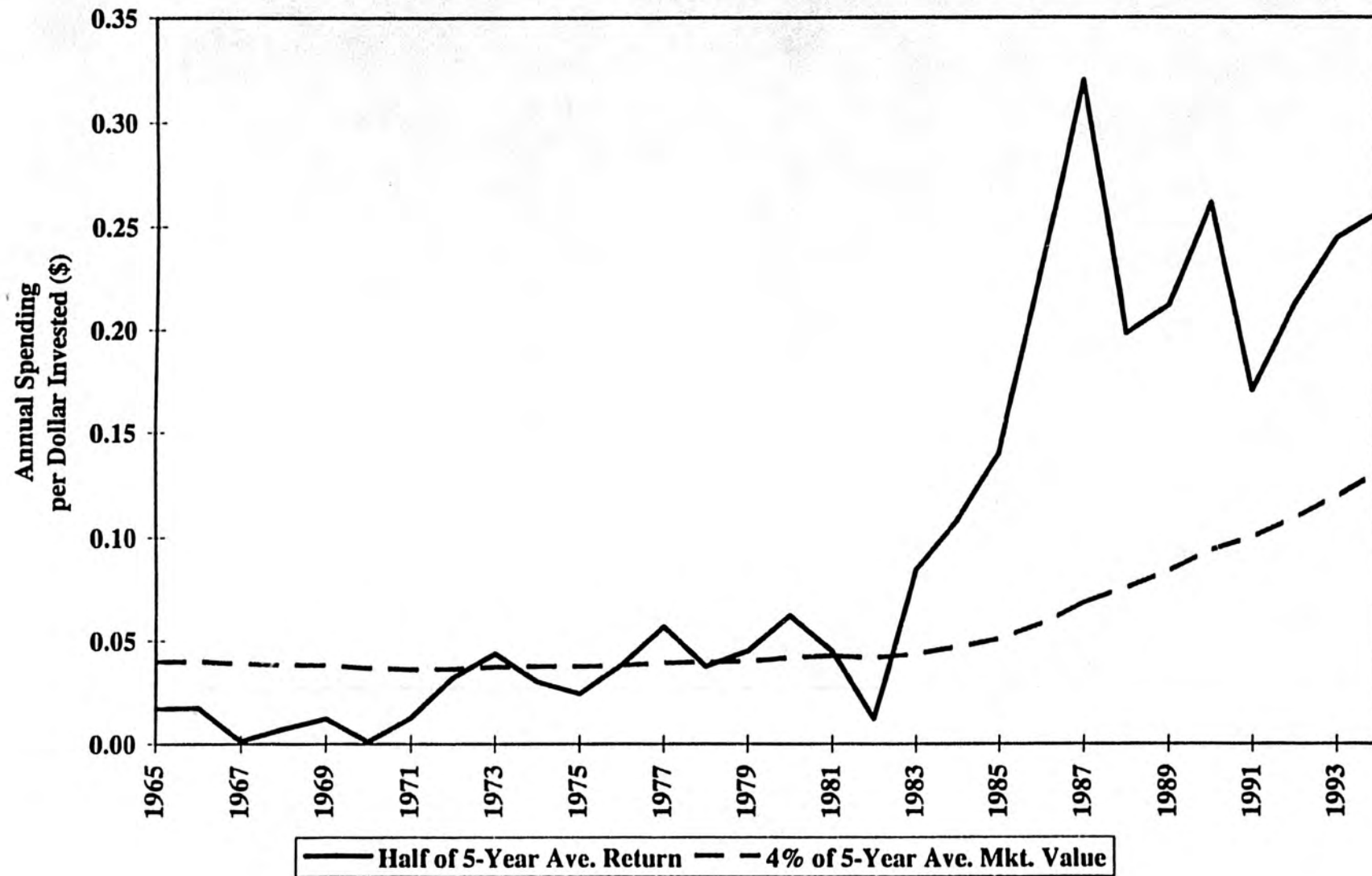
Annual Spending Comparison For 30/70 Allocations 40 Years Ended 12/31/94



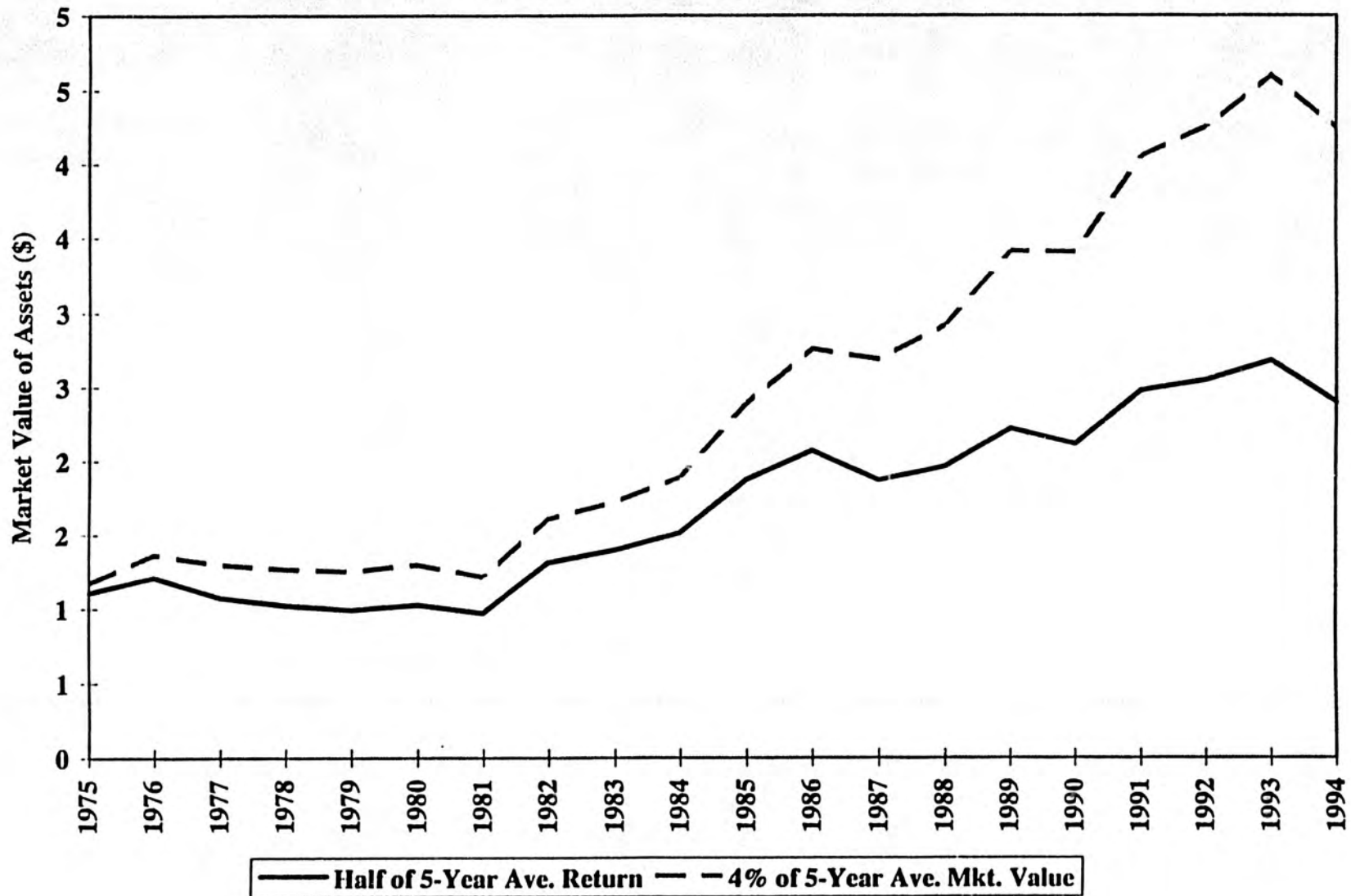
Market Value of Assets Comparison For 30/70 Allocations 30 Years Ended 12/31/94



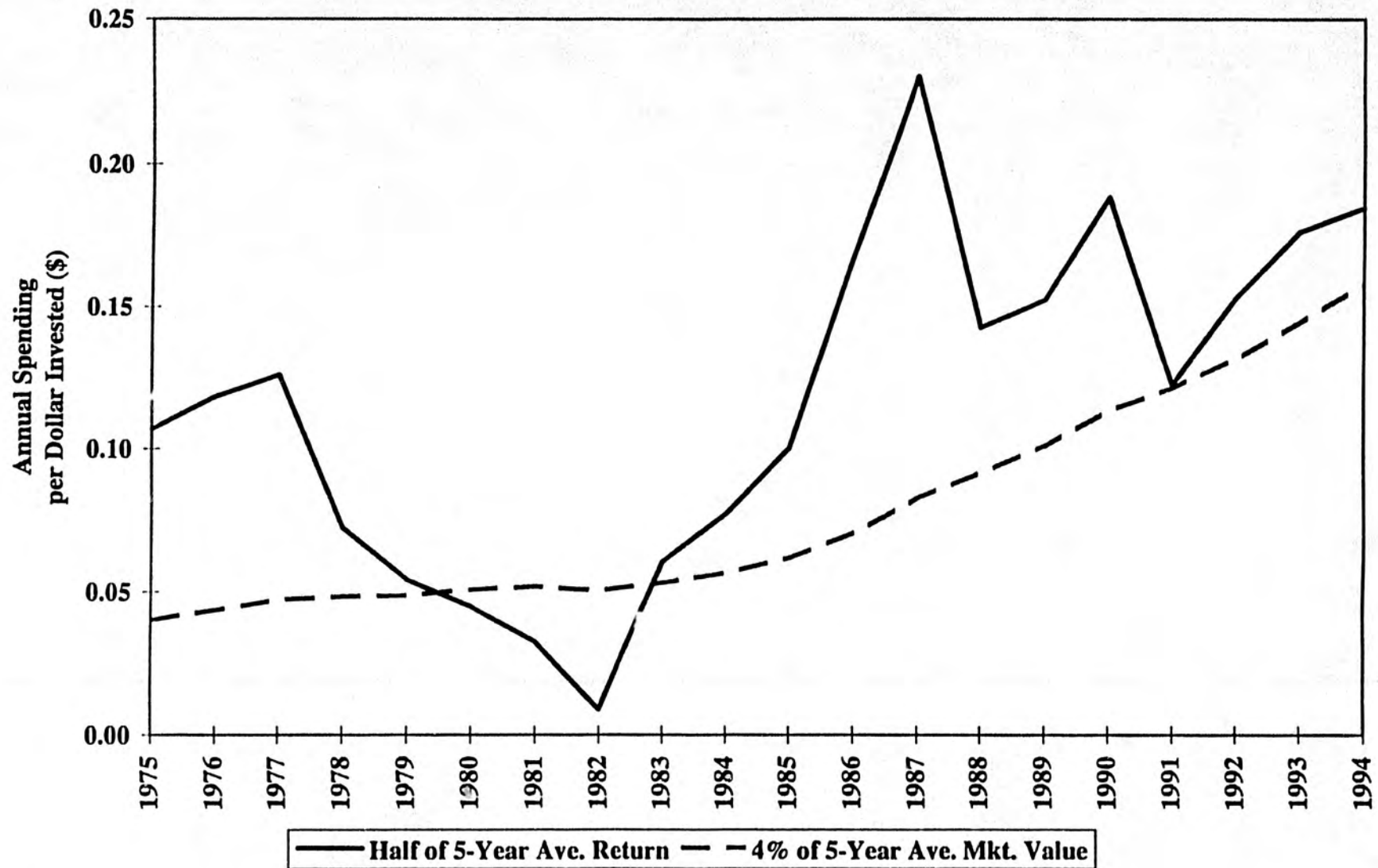
Annual Spending Comparison For 30/70 Allocations 30 Years Ended 12/31/94



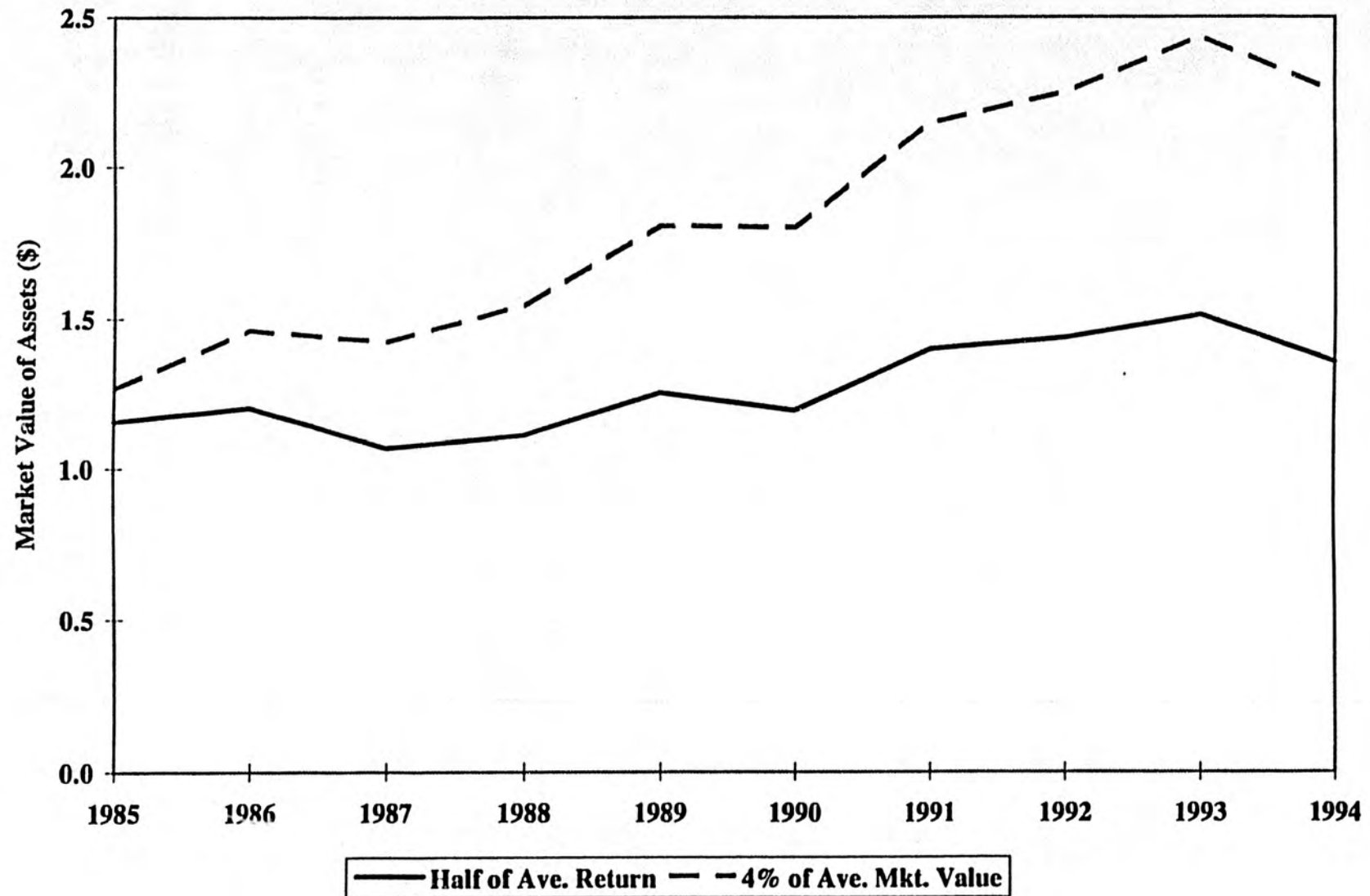
Market Value of Assets Comparison For 30/70 Allocations 20 Years Ended 12/31/94



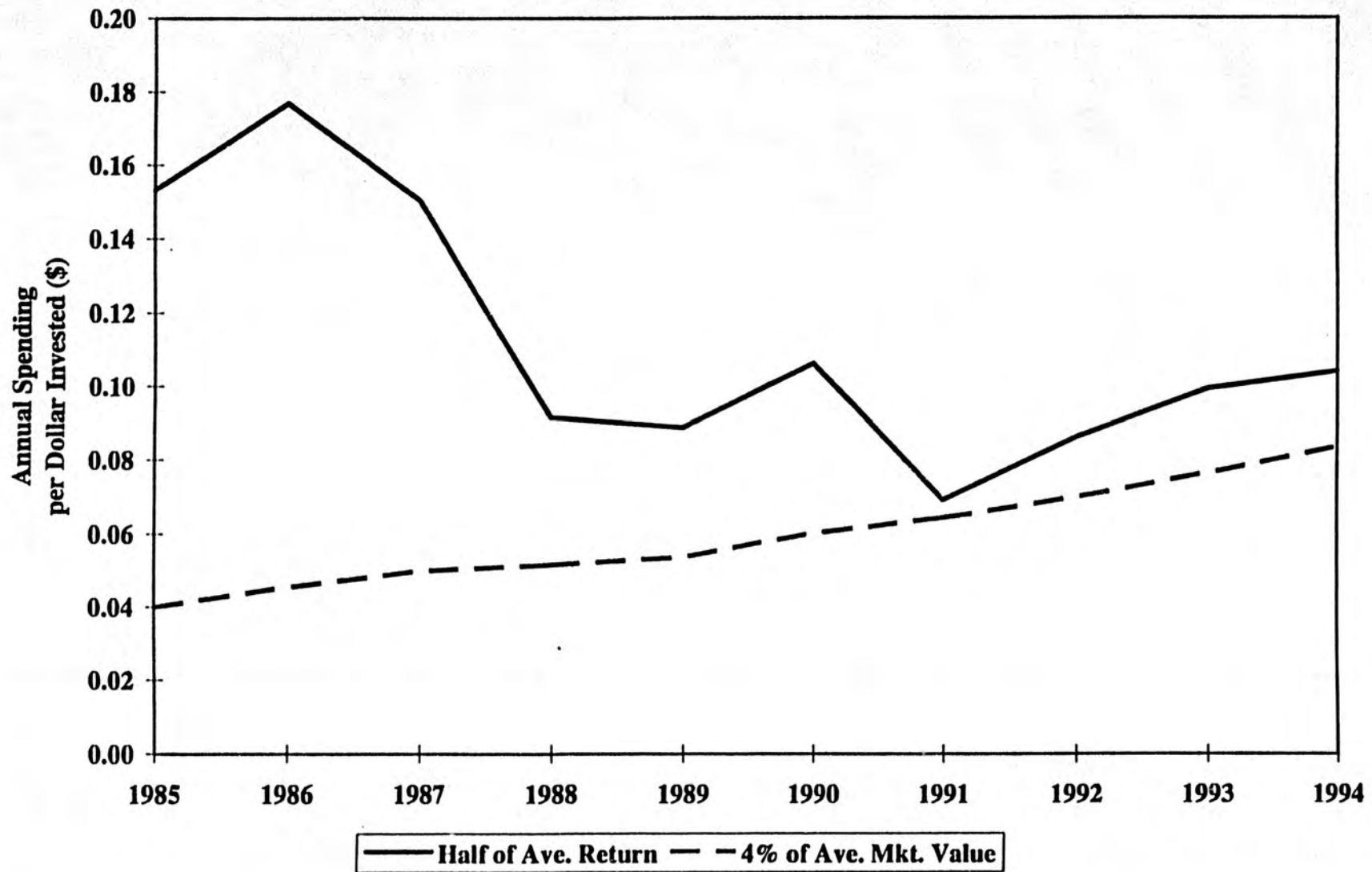
Annual Spending Comparison For 30/70 Allocations 20 Years Ended 12/31/94



Market Value of Assets Comparison For 30/70 Allocations 10 Years Ended 12/31/94



Annual Spending Comparison For 30/70 Allocations 10 Years Ended 12/31/94



Post-It® Fax Note	7571	Date	11/17/95	Page	3
To	Brad Pierce	From	Jim Kelly		
Co./Dept.	OMB	Co.	APFC		
Phone #		Phone #	465-2047		
Fax #	465-3008	Fax #	586-2057		

**Alaska Permanent Fund Corporation**P.O. Box 25500 Juneau, Alaska 99802-5500
(907) 465-2047**MEMORANDUM****DATE:** November 17, 1995**TO:** Byron I. Mallott
Executive Director**FROM:** Jim Kelly *JK*
Director of Communications**SUBJECT:** Proposed Permanent Fund Constitutional
Amendment

This is to provide a debriefing on the meeting I attended this afternoon.
In attendance were:

Nancy Slagle	Joe Thomas
Jim Baldwin	Don Wannie
Jack Kreinheder	Forrest Brown
Jack Fagnoli	Brad Pierce

The purpose of the meeting was to review the proposed Constitutional amendments relating to the Permanent Fund and the Constitutional Budget Reserve, walk through the mechanics of how they would work, and determine potential issues to be resolved.

It was a good meeting and the attendees worked well together. Others may have different recollections, but according to my notes, the issues discussed were basically as outlined below.

- If the voters approve the change in November of 96, the amendment would take effect in February of 1997; the consensus was that a July 1, 1997 effective date would be preferable.
- Should the period of time during which the limited appropriations take effect be a calendar year or a fiscal year? The group appeared to favor

Proposed Constitutional Amendment
November 17, 1995
Page 2

fiscal year for simplicity and consistency sake, and also because it works better in the context of the next issue (see below).

- There needs to be a clear understanding of what "immediately preceding five calendar years" means. For example, let's say that the voters approve the amendment in November of 1996 and it becomes effective July 1, 1997, the beginning of fiscal 1998. The 1997 legislature, then, would be including the 4% contribution from the Permanent Fund, in its deliberations on the fiscal 1998 budget. If the purpose of the proposed language is to enable the lawmakers to put an exact dollar amount on the Permanent Fund contribution, then the "immediately preceding five calendar years should mean the five calendar years immediately preceding the fiscal year in which the appropriations take effect.
- What should be the payment schedule for the Fund's 4% contribution? There appeared to be agreement that it would be in the best interest of the Permanent Fund to allow the Trustees the maximum flexibility in terms liquidating assets to make payments out of the Fund, so the notion of monthly payments arose as a sensible approach.
- How should that payment schedule be addressed in the law? Perhaps there is a need to spell this out in some formal way to avoid a situation in which the state is faced with a cash flow problem and pressure is brought to bear on the Permanent Fund to deliver the 4% contribution on a faster payment schedule, even if it means the Trustees may have to liquidate assets at a non-advantageous moment. No one favored putting payment schedule language in the proposed Constitutional amendment, so the alternatives are to (1) leave it unaddressed; (2) address it in the front section of each year's appropriation bill; or (3) or write it into the statutes via some kind of "implementing legislation."
- Regarding "implementing legislation," it will be necessary to change/eliminate the existing statutory language regarding dividends, inflation-proofing, the earnings reserve account and the dedicated oil contributions. Legislation likely also will be required to address the nuances associated with the term "market value." Although those two words may have a clear meaning, the term "average market value" may not, particularly in light of the 4% annual liability for payments going out of the Permanent Fund. Should passage of the implementing

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Page 3**

legislation be tied to the Constitutional amendment? Should it be passed first or later?

- The issue was raised whether or not the Constitutional amendment should be expanded to provide clear authority for the Permanent Fund to invest, not in investments specifically included in an investment list, but rather under the broader provisions of a Prudent Investor Rule.
- Two issues were raised regarding the Constitutional Budget Reserve. Number one, even after enactment of this plan, there still needs to be a provision included in the front section of future annual appropriation bills allowing the state to borrow from the CBR in times of cash flow problems, which would tend to occur in the first quarter of the fiscal year. Number two, it is likely that even though the OMB spreadsheet lists a transfer of \$607 million in fiscal 1996 and \$207 million in fiscal 1997, it is not likely that an appropriation from the CBR to the Permanent Fund would be effective until fiscal 1998, and that probably not until December 1, 1998 to allow the state's accountants sufficient time to determine the final year-end balance in the CBR.

I expect to see a similar memorandum on the subject soon from Brad Pierce, and will pass it on as it becomes available.

cc: Board of Trustees
Brad Pierce



Callan Associates Inc.



Alaska Permanent Fund Simulations
December 1995

Alaska Permanent Fund Simulations

Attached are the results of the Endowment Distribution Study simulations for the key variables associated with the proposed payout strategy for the Alaska Permanent Fund. A previous analysis was performed by LRFPC, which made static assumptions about the year-to-year earnings of the Fund. This project takes that work one step further by allowing the earnings to vary in each year. The purpose of this memo is to describe how this analysis was carried out.

The foundation for the simulation analysis was the "Endowment Scenario Projection" spreadsheet provided to us by the Permanent Fund. In essence, we recreated this spreadsheet but allowed the returns to vary with time. In addition, some of the data that was used to construct the original spreadsheet was not explicitly shown. This data, which consisted of historical market values and earnings, was provided to us separately by Jim Kelly of the Permanent Fund.

Once the basic spreadsheet was constructed, we created the simulated returns. This was a two step process. First, we simulated the returns for each of the individual asset classes used in the proposed alternative portfolios. The simulation process for each asset class consists of identifying a stream of random returns that has a mean return and standard deviation that is consistent with our 1995 Capital Market Projections. This process is also constrained so that the correlations between asset classes are in line with the projections. These projections are listed on the following page.

The second step was to create returns for the alternative portfolios. This was accomplished by weighting the individual asset class returns by their weights in the portfolios. The three portfolios evaluated cover a range from relatively low risk and return to a portfolio containing 70% equity. The portfolios are shown on the following page.

The result of these two steps is a stream of returns for each of the three portfolio alternatives. These returns are then inserted into the spreadsheet for fiscal years 1996 through 2010. This process is repeated for 200 sets of random returns so that the full range of the variables in the spreadsheet can be explored.

ASSET CATEGORY PROJECTIONS

Returns, Risks and Yields

Categories Used In Modeling	Nominal Return	Real Return	Standard Deviation	Yield
Callan Large Cap	9.70	5.70	12.40	3.00
Callan Med/Small	10.30	6.30	15.12	2.25
MSCI EAFE	10.30	6.30	19.00	2.00
Emerging Markets	13.00	9.00	31.00	1.80
Lehman Aggregate	7.60	3.60	6.30	7.60
SB Non-US Gov	7.50	3.50	12.00	7.50
Real Estate	8.60	4.60	18.00	6.00
T-Bills	4.80	.80	0.80	4.80
CPI	4.00	N/A	1.00	N/A

Correlations

	Callan Large	Callan Med/Sm	MSCI EAFE	Emerging Markets	Lehman Aggreg	Salomon Non-US	Callan Real Estate	T-Bills
Callan Med/Sm	0.86							
MSCI EAFE	0.48	0.43						
Emerging Markets	0.57	0.64	0.26					
Lehman Aggreg	0.44	0.35	0.37	0.17				
SB Non-US Gov	0.21	-0.04	0.54	-0.05	0.57			
Real Estate	0.20	0.20	0.10	0.15	0.28	-0.10		
T-Bills	0.30	0.01	-0.15	0.05	0.05	-0.15	0.10	
CPI	-0.50	-0.45	-0.60	-0.30	-0.10	-0.30	0.20	0.30

PORTFOLIO ALTERNATIVES

	Conservative	Current	70% Equity
Domestic Equity:			
Large Cap	20	21	25
Small/Mid Cap	0	14	14
International Equity:			
EAFE	5	10	25
Emerging Markets	0	0	6
Real Estate	7	10	10
Fixed Income	68	45	20
TOTAL	100	100	100
Return	8.22%	8.79%	9.60%
Risk	6.79%	8.09%	8.81%
Yield	6.29%	5.17%	3.79%

The graphs of the results represent the ranges and the associated probabilities of the key variables for each of the portfolio alternatives. The variables are the Endowment Earnings, Market Value, Fiscal Gap and the Constitutional Budget Reserve Balance. The Endowment Earnings is the 4% of 5-year average market value that is transferred to the State each year. The Market Value is the end of the year value after all transfers into and out of the Fund. The Fiscal Gap is the difference between all projected State revenues and State spending including the dividend. The Constitutional Budget Reserve Balance is the end of the year value of the reserve set aside to make up the difference for years when spending exceeds revenues.

We urge readers to be cautious in interpreting the results. In preparing the analysis, we have been careful to incorporate the key proposals as we understand them. Our understanding may be mistaken. Nonetheless, we believe the analysis provides useful information for consideration and further analysis.

Among the key governmental policy assumptions implicit in the initial spread sheet provided us are:

1. Beginning in 1998, distributions from the APFC are 4% of 5 year average market value.
2. The CBR is capped at \$1.5 billion. Amounts above this level are added to the APFC.
3. Dividends (a part of state expenditures) decline to \$415 million and remain flat through the projection period.
4. State revenues and expenditures are input as a given. The only variable considered is "endowment earnings." Such earnings are a function of market values which, of course, are dependent primarily on asset class return and asset allocation policy.

The analysis covers the proposed transition period. This makes all projections particularly sensitive to the initial 1-3 year forecasts of asset transfers, etc. We emphasize this point so that consideration be focused on the pattern of outcomes, not specific values.

The following patterns are noteworthy:

1. The current investment policy results in both higher ending market values and distributions than the "conservative" investment policy.

2. An aggressive equity oriented policy produces even greater ending market values and distributions. However, through most of the forecast period there is some possibility that distributions could be less than under the current policy.
3. The largest potential "fiscal gap" occurs in 2010 and is similar under all three investment policies.
4. The range of distributions grows through time regardless of policy but is greater with the more aggressive policies. However, the worst case distribution in 2005 is \$959 million for the conservative policy, \$948 million for the current policy and \$925 million for the aggressive policy. The median expected distributions in the same year are:

Conservative	\$1,134 million
Current	\$1,174 million
Aggressive	\$1,268 million

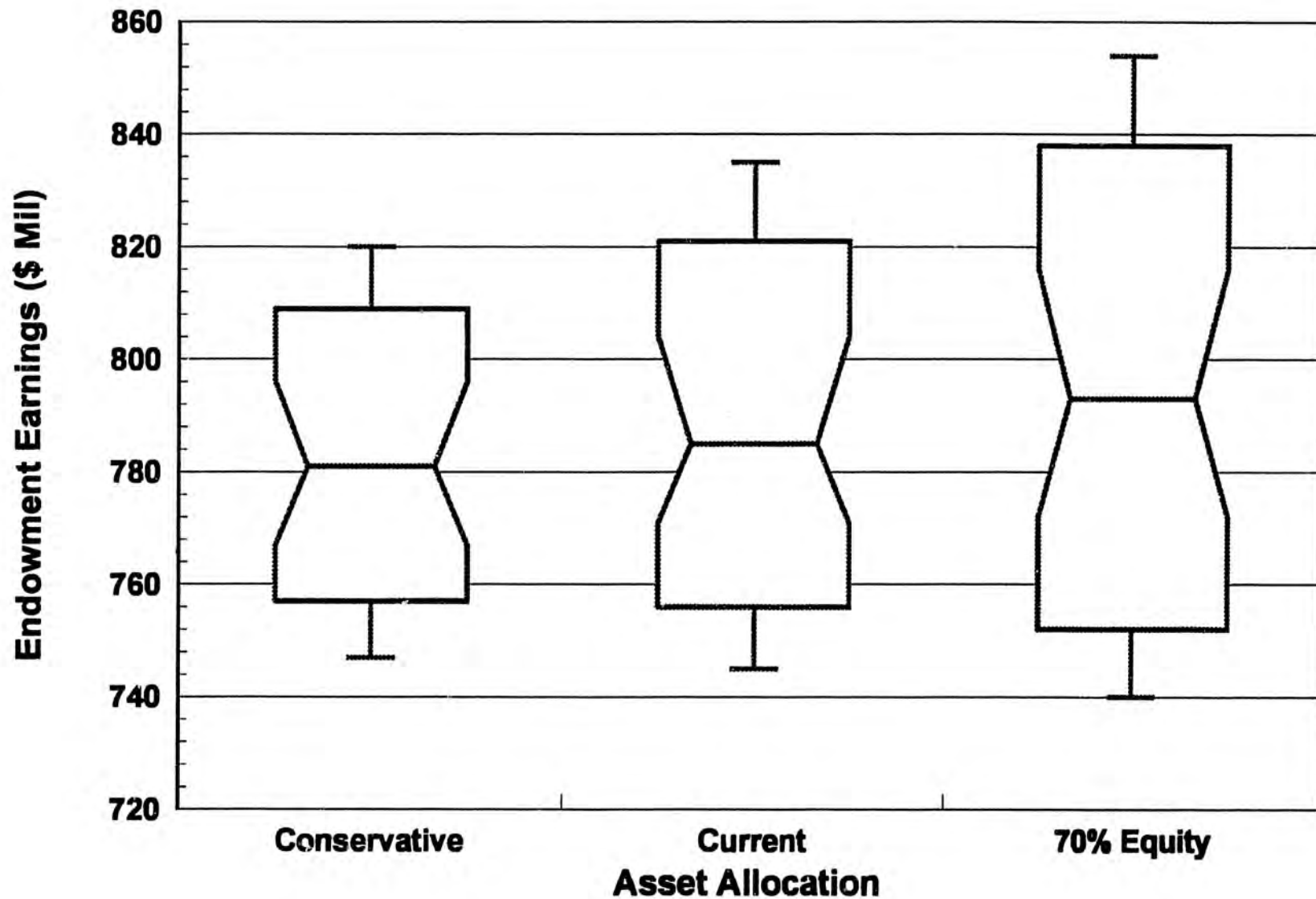
By 2010, the worst case for the aggressive policy is better than the worst case for the current policy, which, in turn, is better than the worst case for the conservative policy (\$1,211, \$1,190 and \$1,187, respectively).

5. The CBR remains at \$1.5 billion until late in the projection and even then falls below that level typically under $\frac{1}{4}$ or less of the simulations.

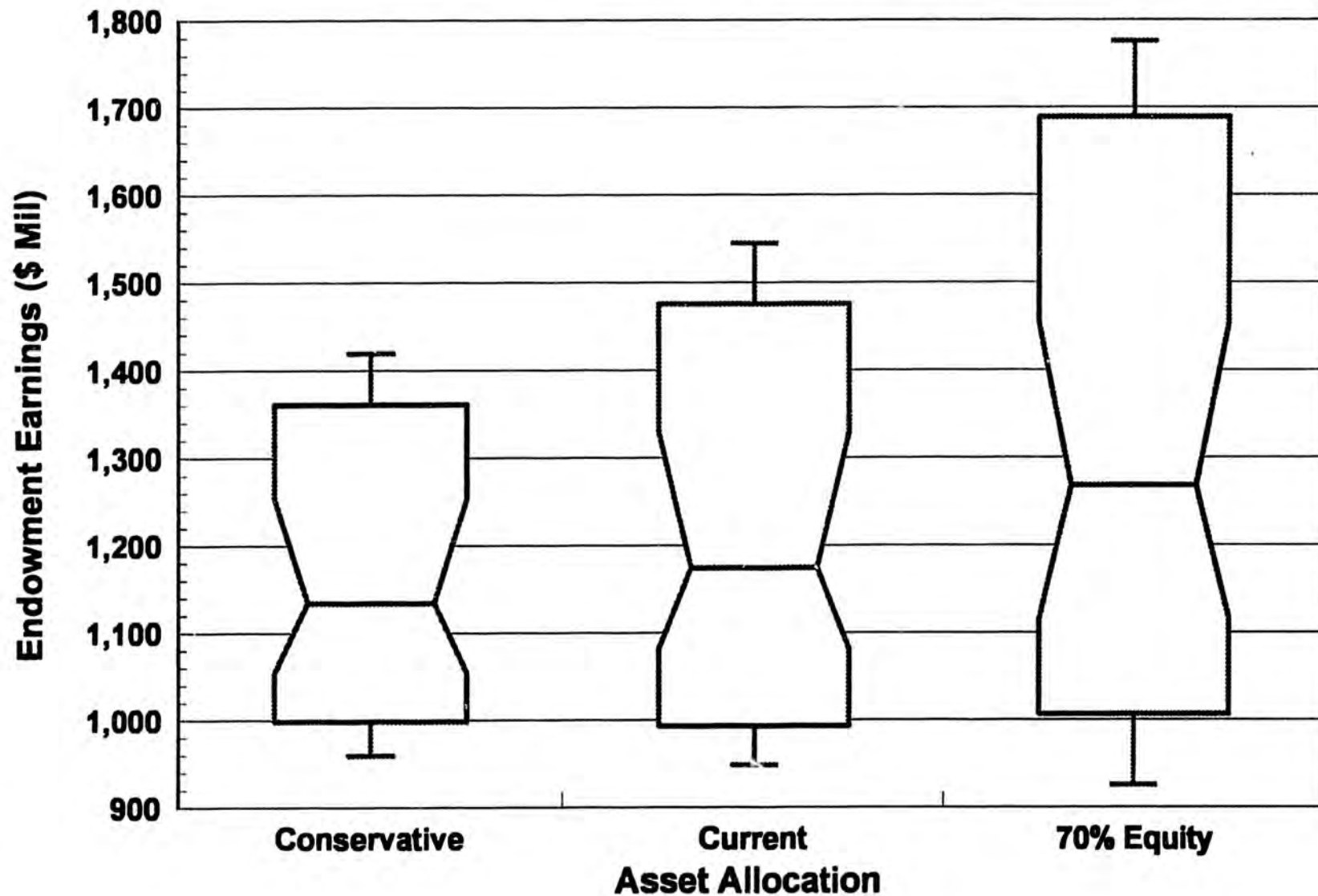
Michael J. O'Leary, Jr., CFA
Executive Vice President
December 3, 1995

James Van Heuit
Vice President

**Endowment Earnings
(4% of 5 Year Ave. Mkt Value)
Fiscal Year 2000**

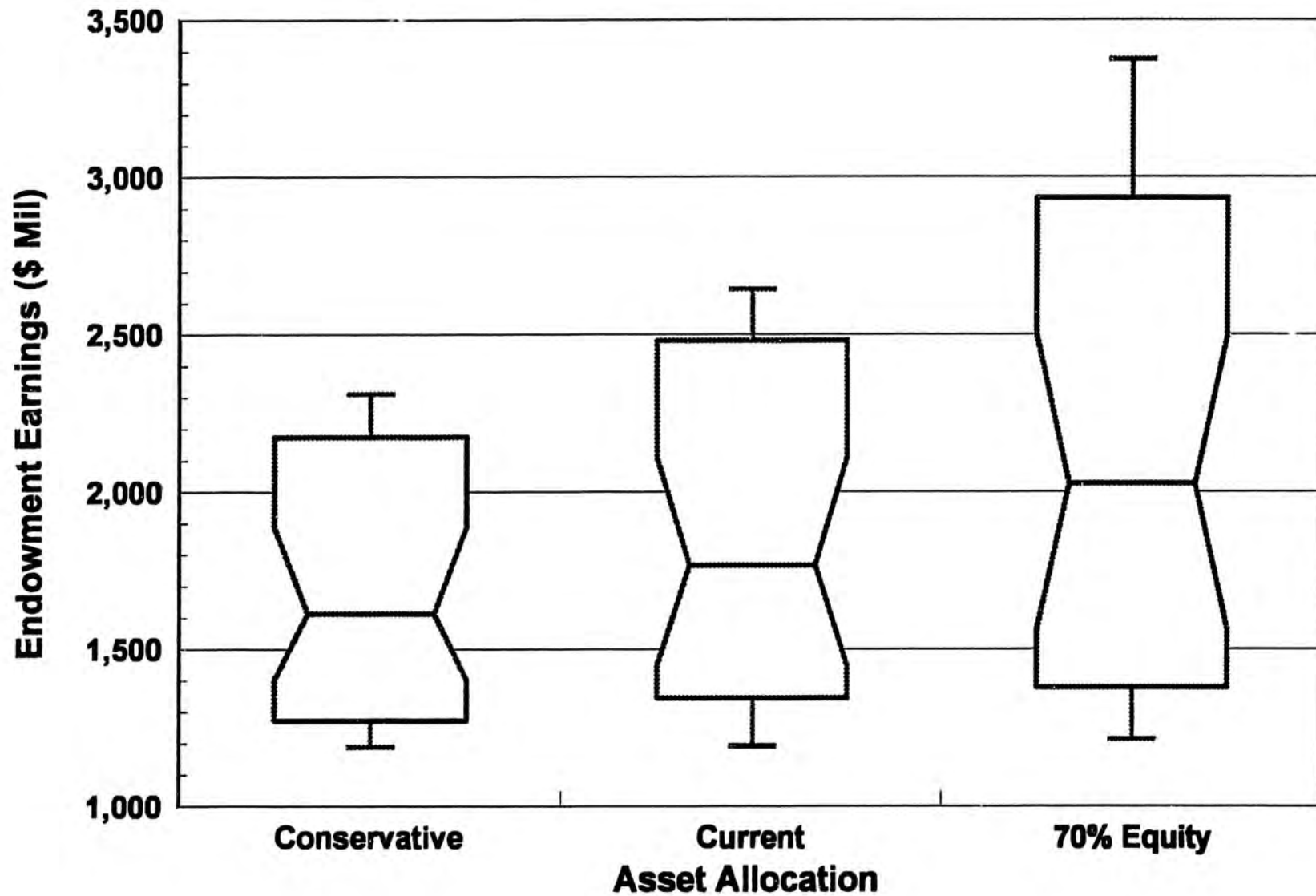


**Endowment Earnings
(4% of 5 Year Ave. Mkt Value)
Fiscal Year 2005**

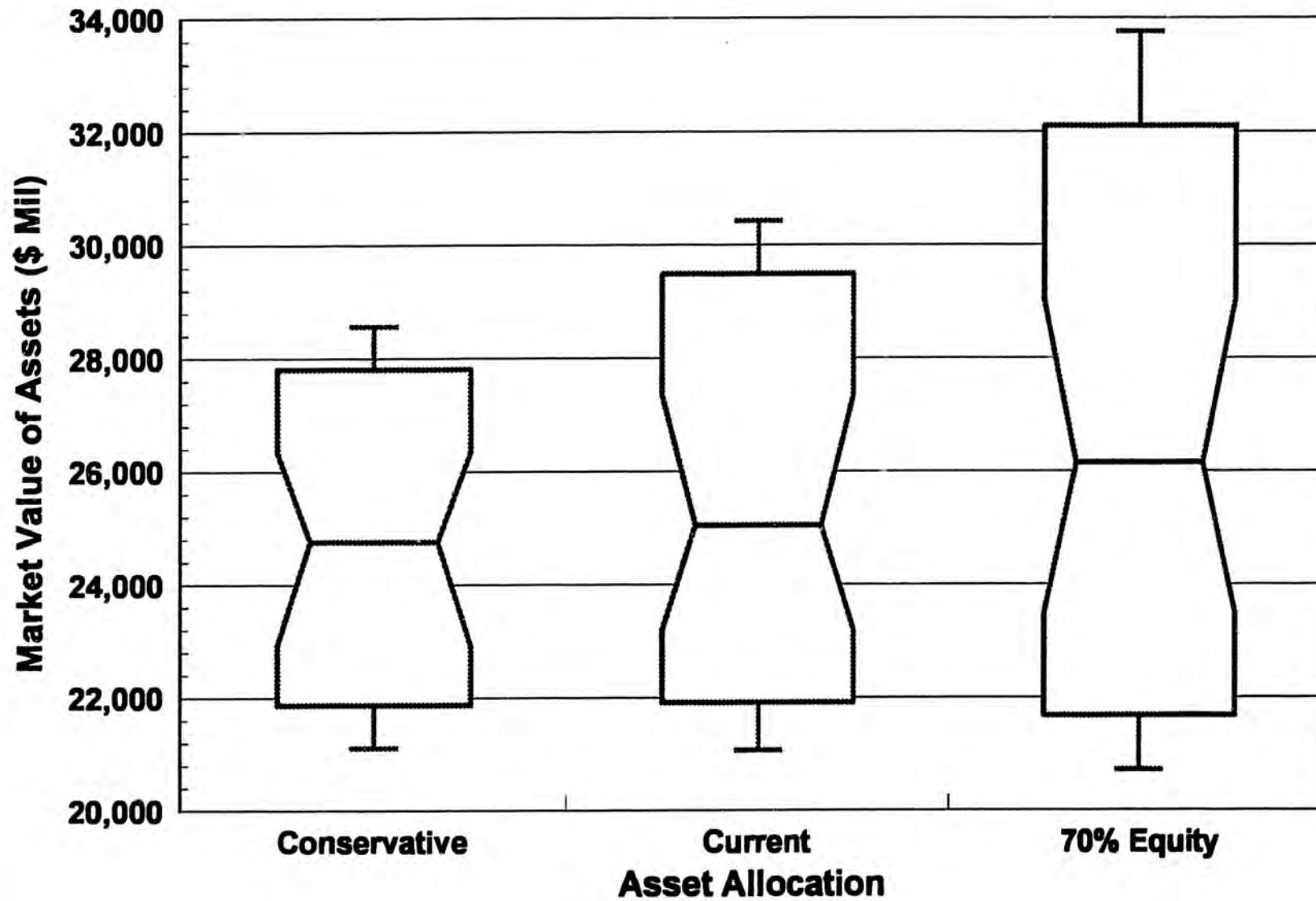


Endowment Earnings (4% of 5 Year Ave. Mkt Value) Fiscal Year 2010

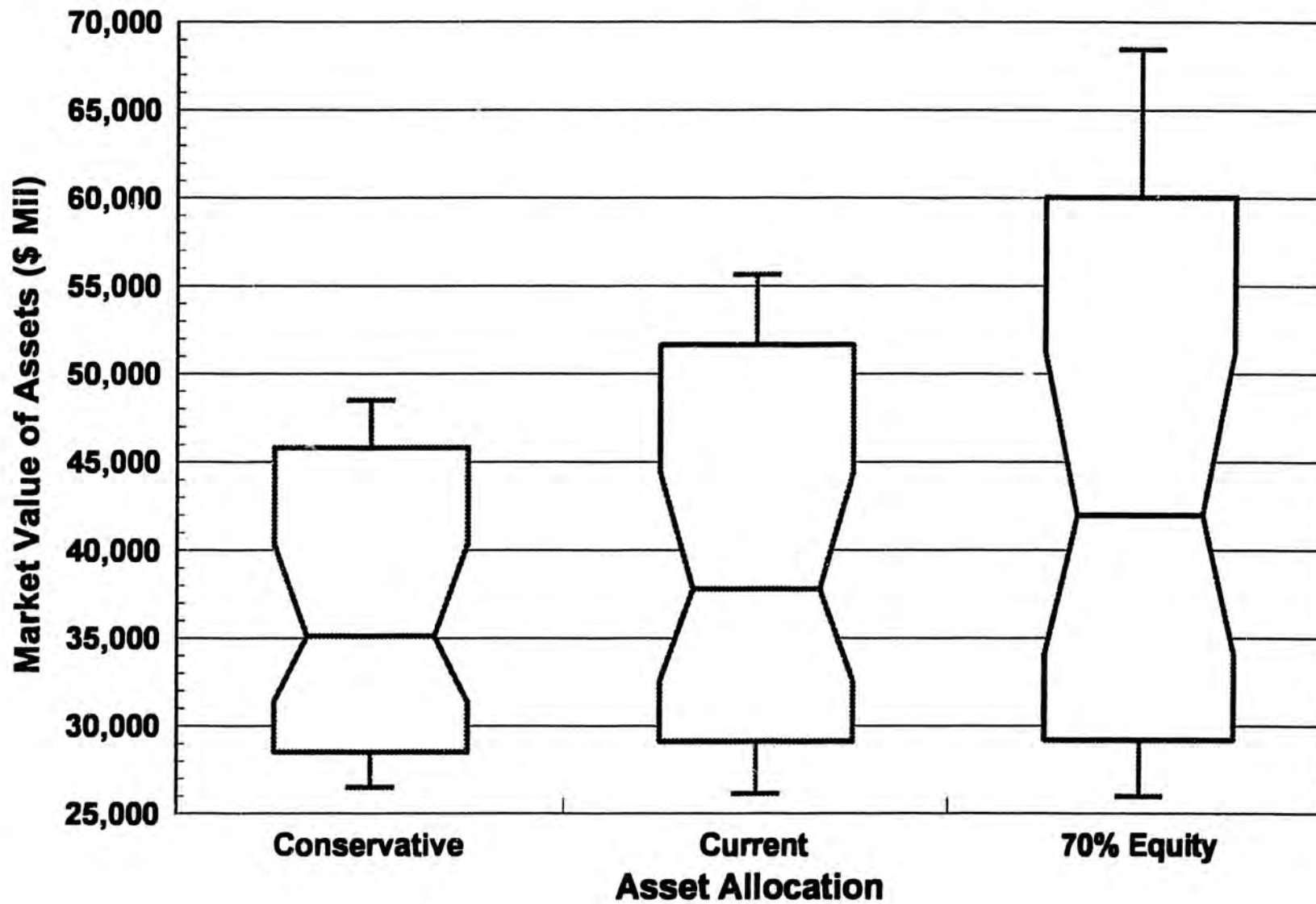
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Market Value of Assets Fiscal Year 2000

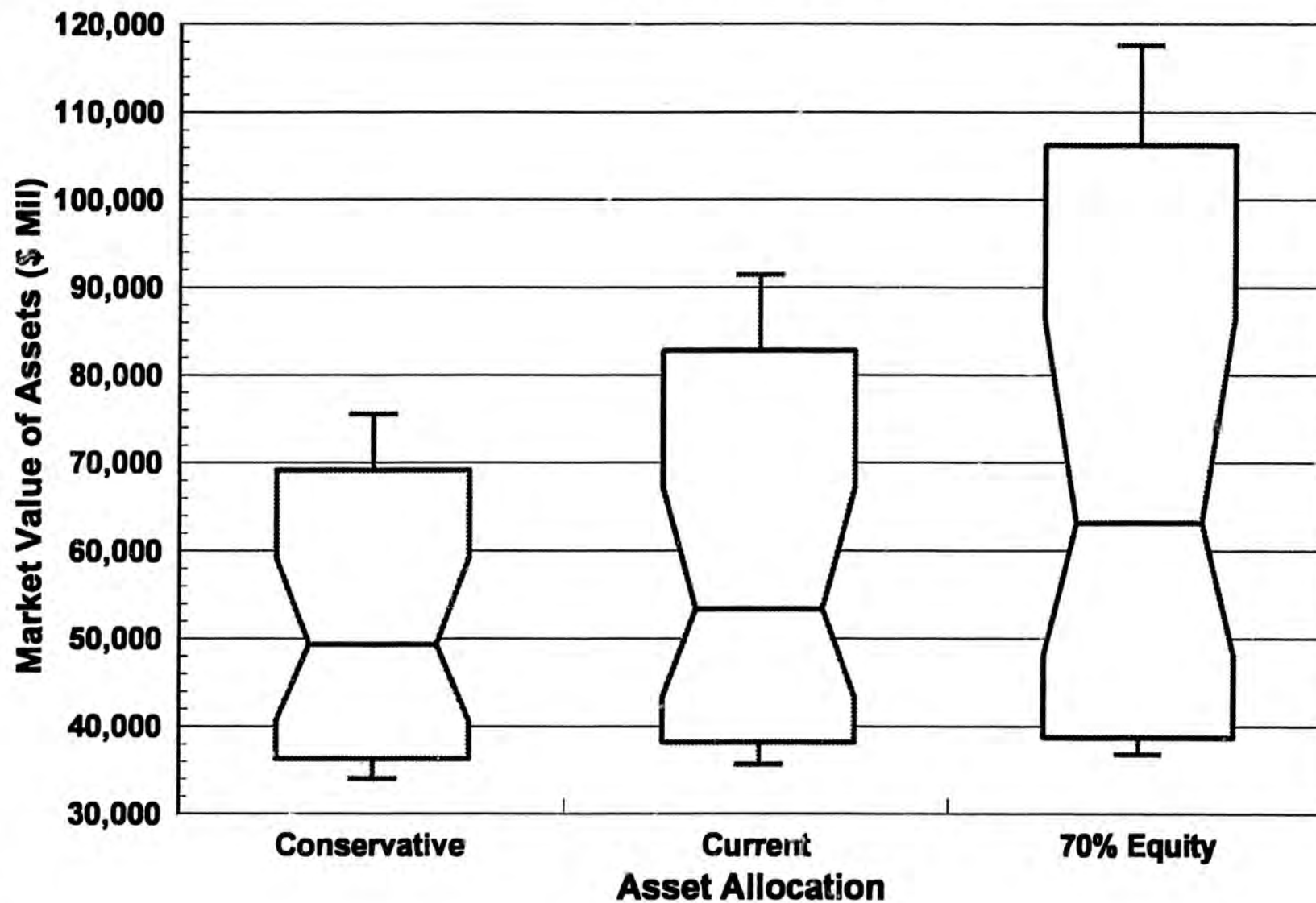


Market Value of Assets Fiscal Year 2005



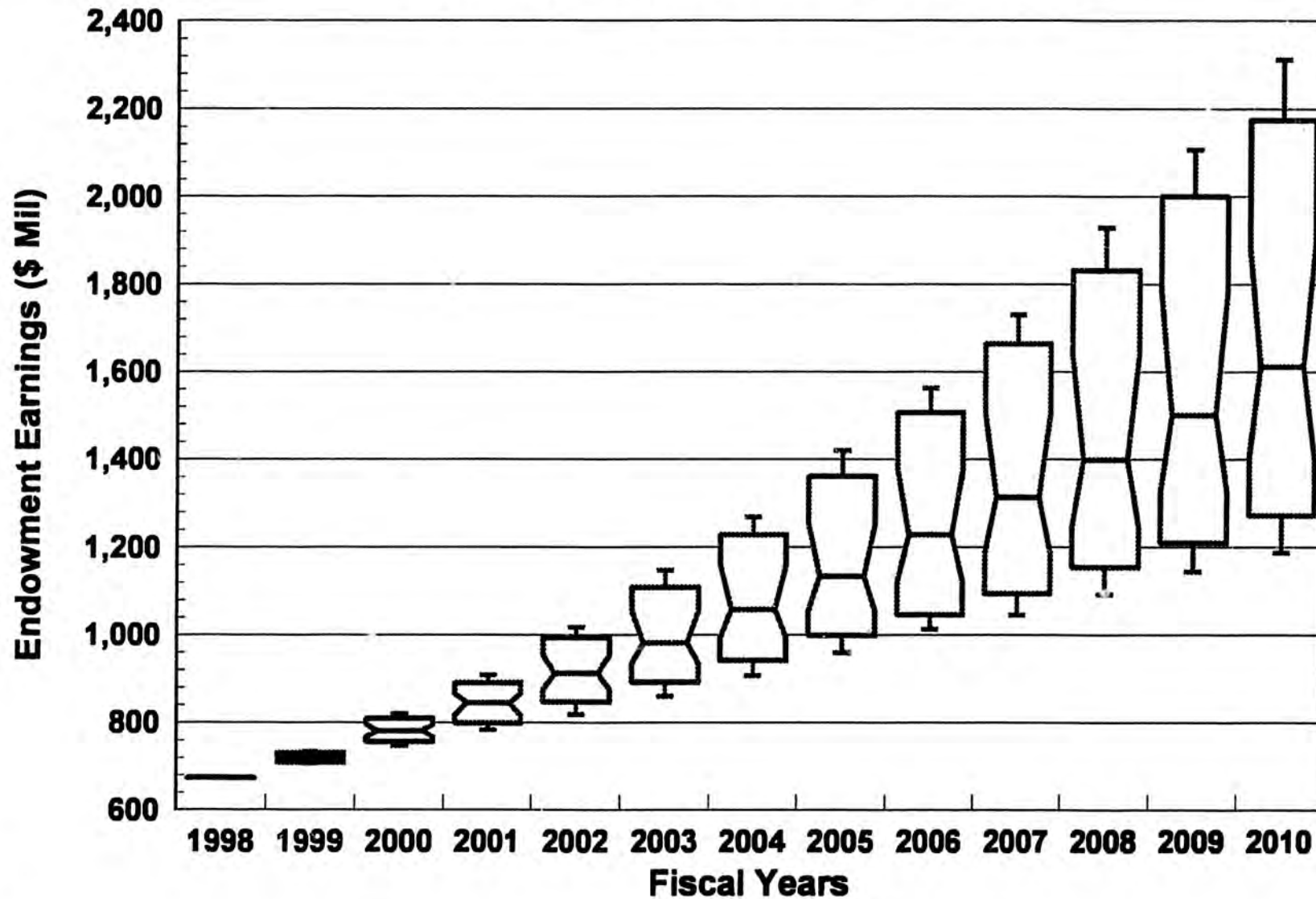
Market Value of Assets Fiscal Year 2010

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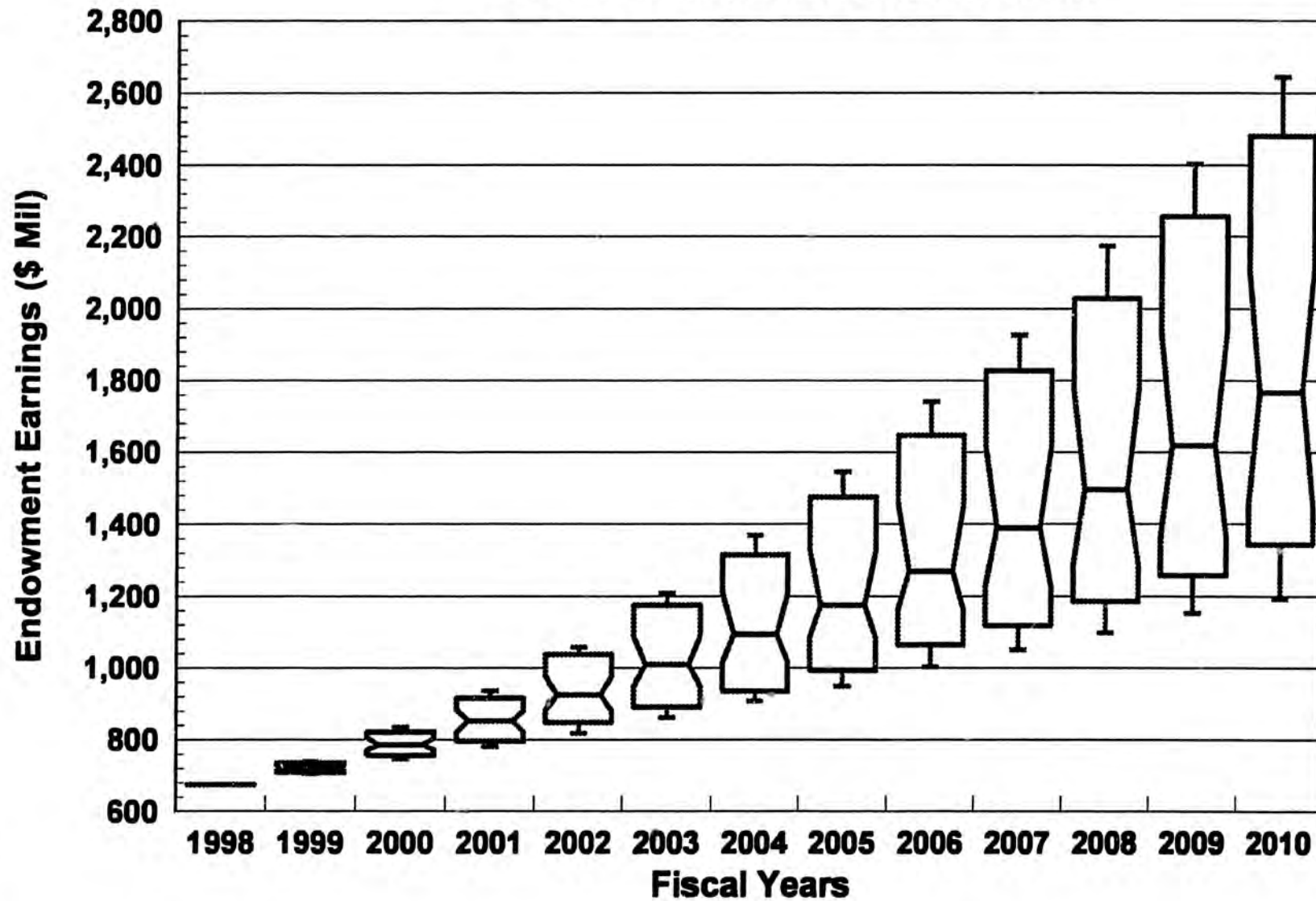


Endowment Earnings (4% of 5 Year Ave. Mkt Value) Conservative Asset Allocation

Callan Associates Inc.

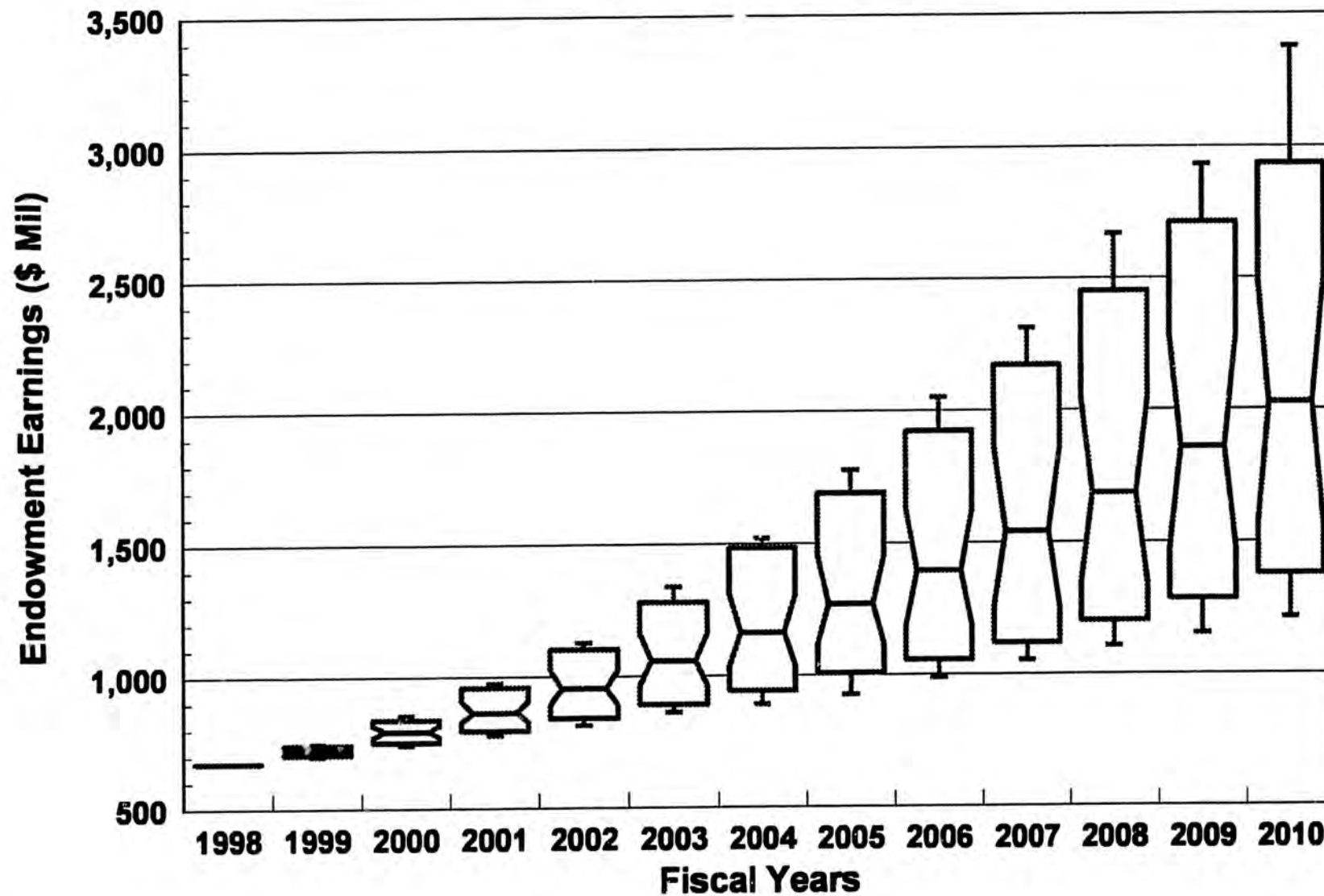


Endowment Earnings (4% of 5 Year Ave. Mkt Value) Current Asset Allocation

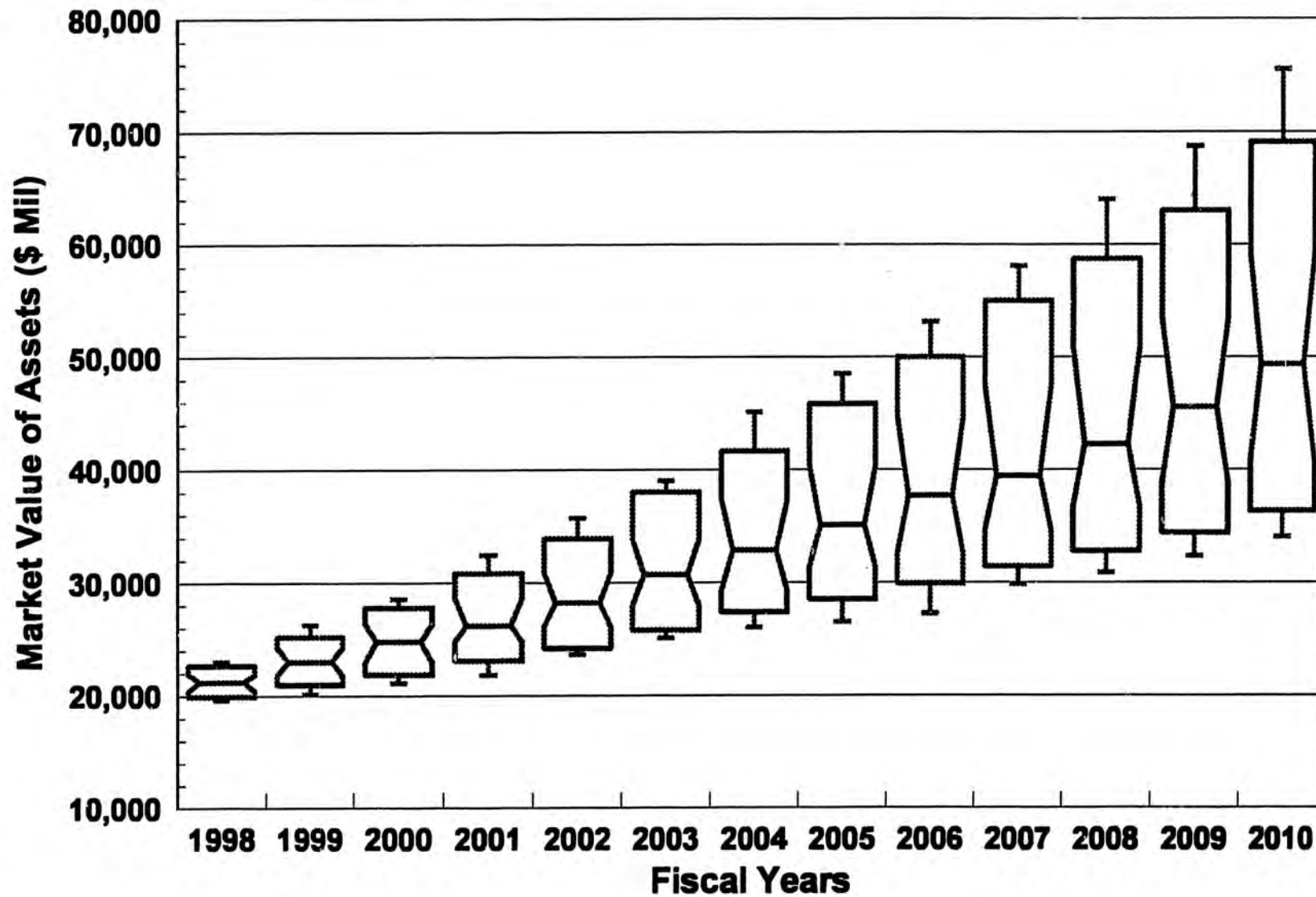


Endowment Earnings (4% of 5 Year Ave. Mkt Value) 70% Equity Allocation

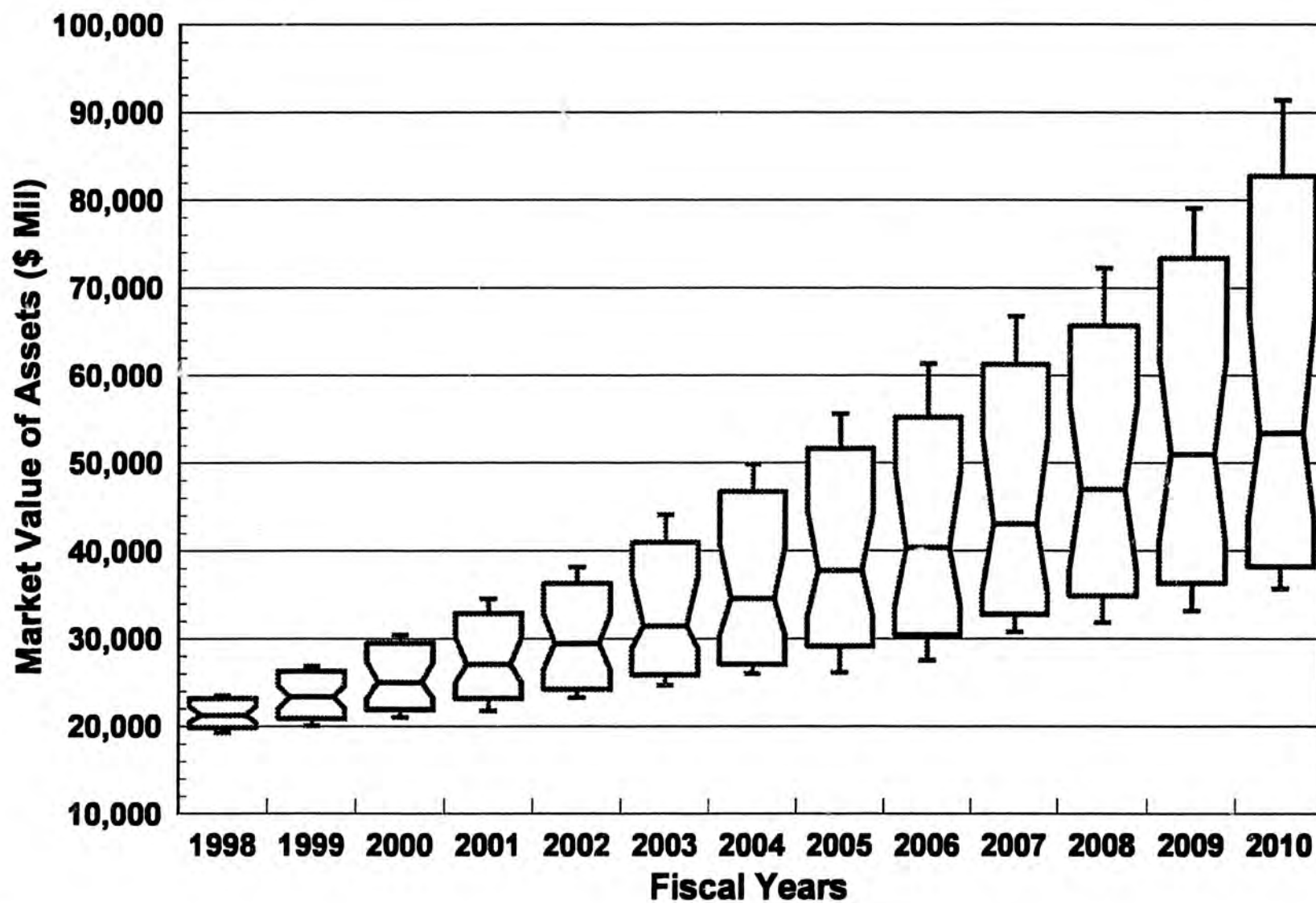
Callan Associates Inc.



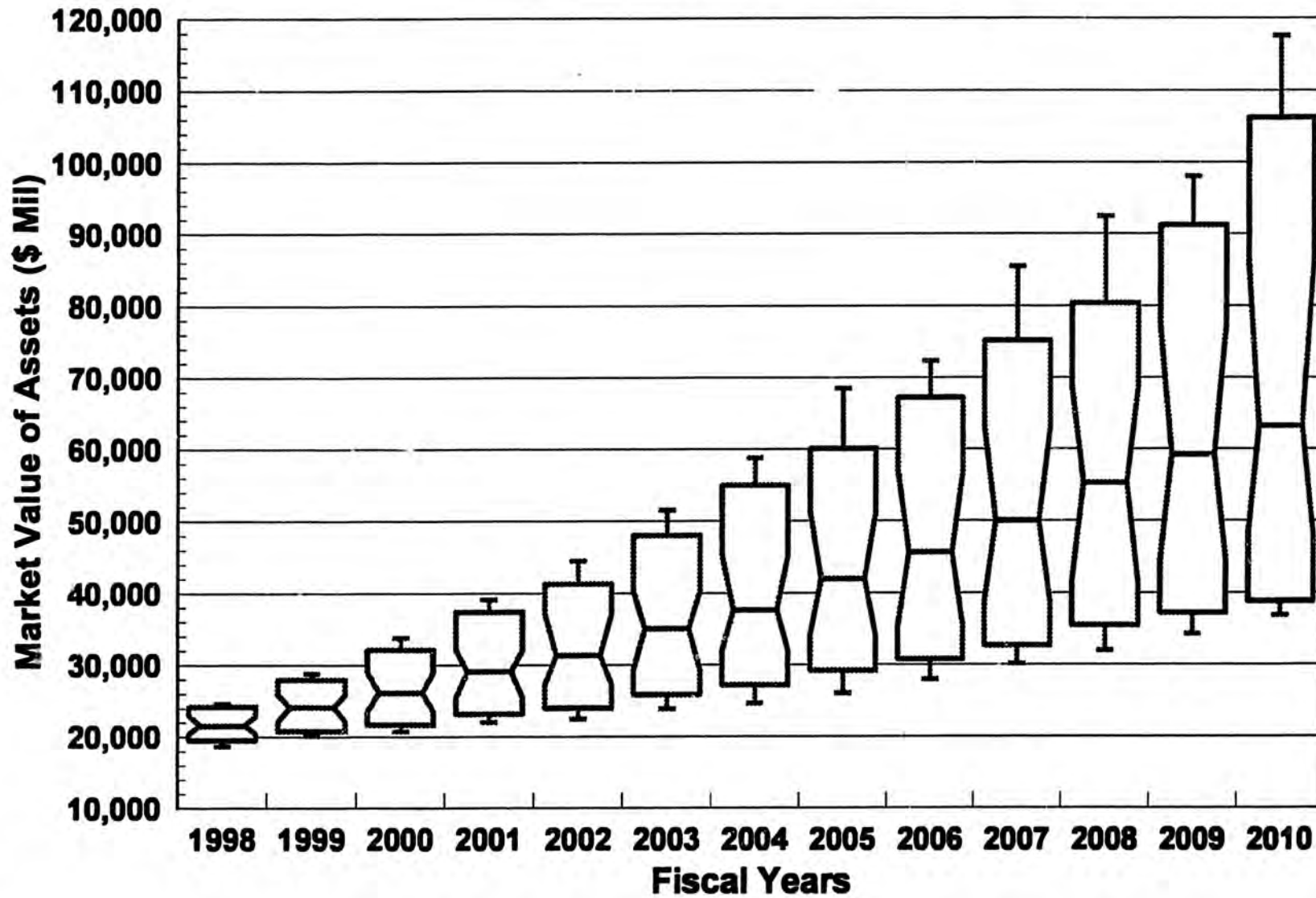
Market Value of Assets Conservative Asset Allocation



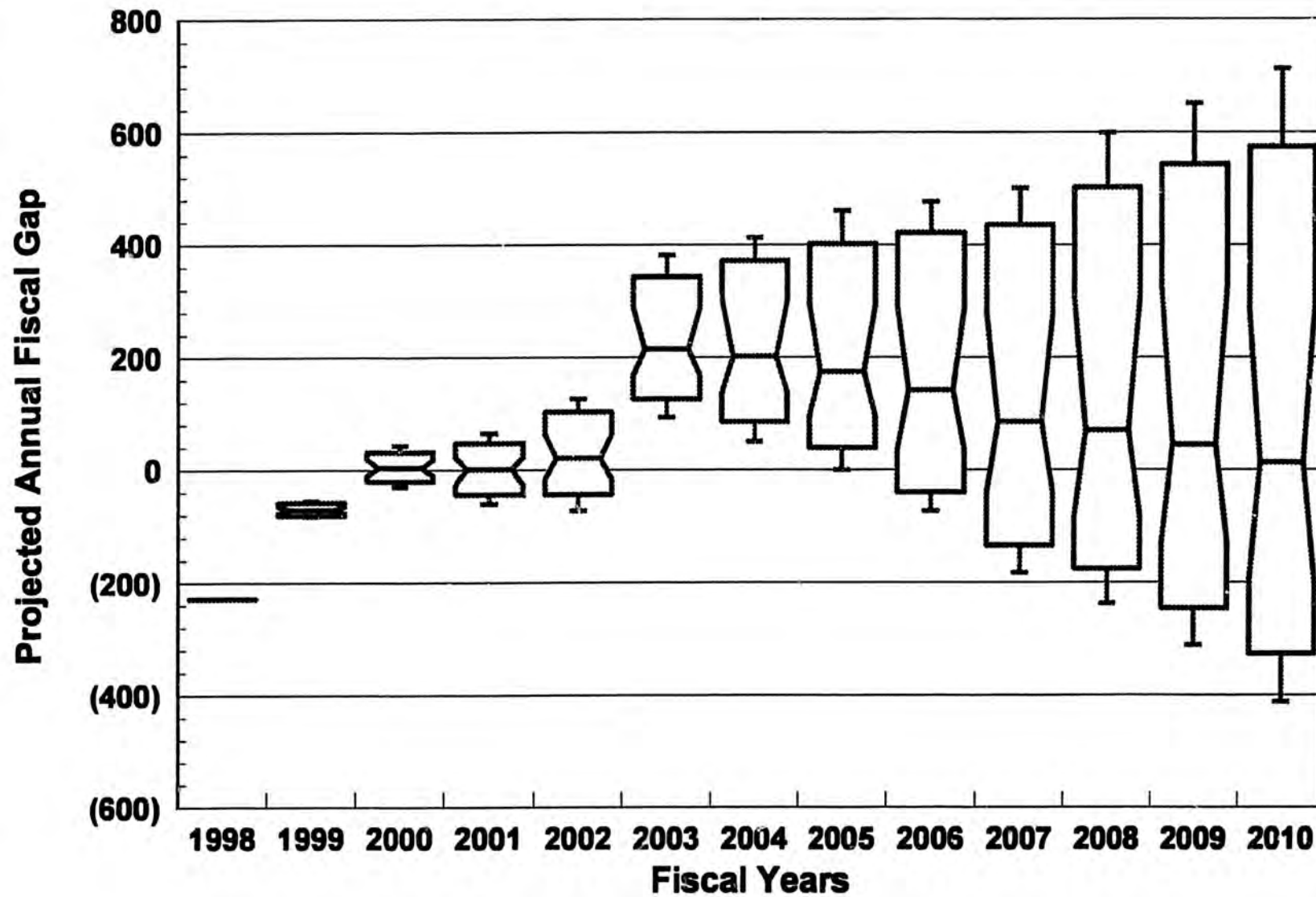
Market Value of Assets Current Asset Allocation



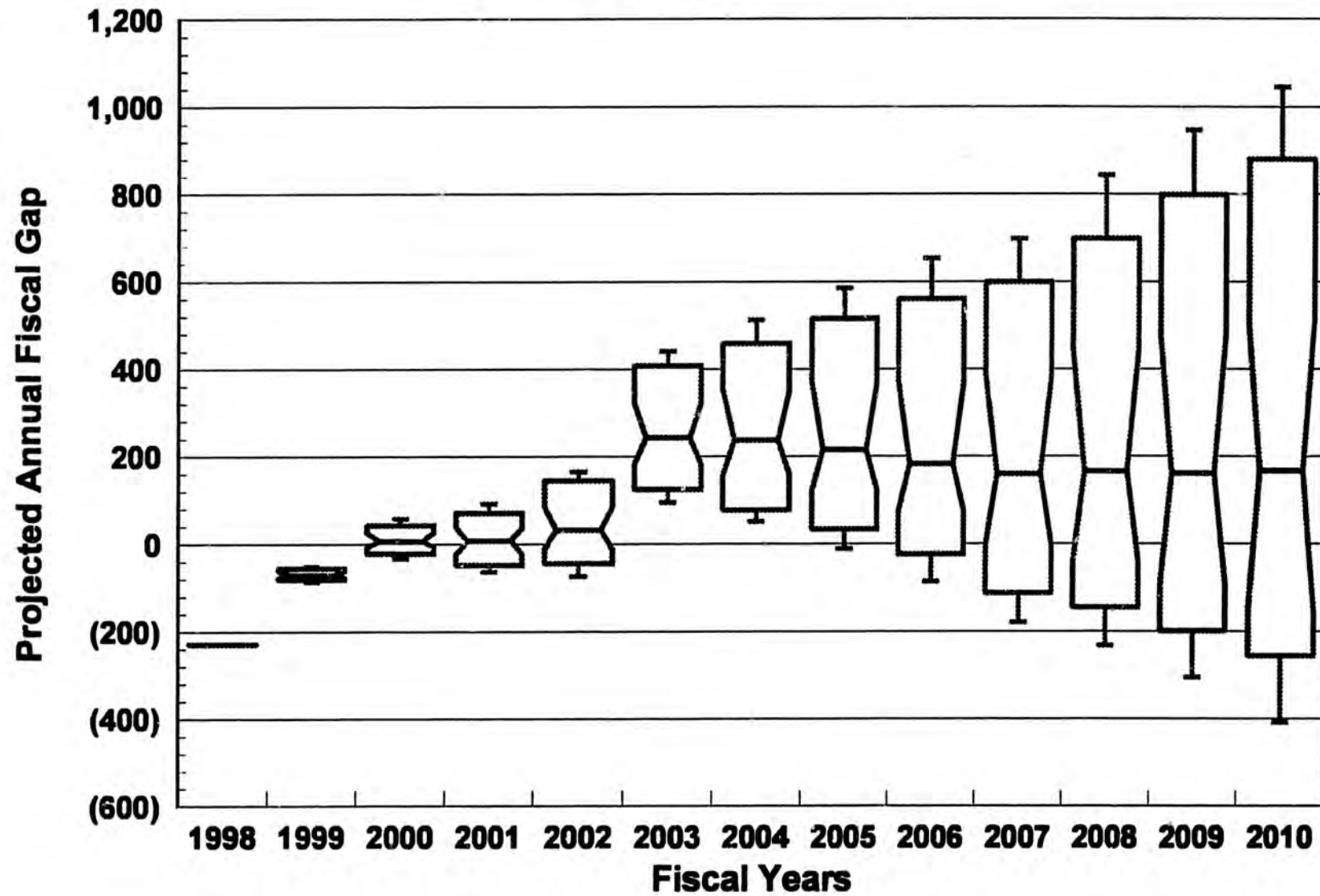
Market Value of Assets 70% Equity Allocation



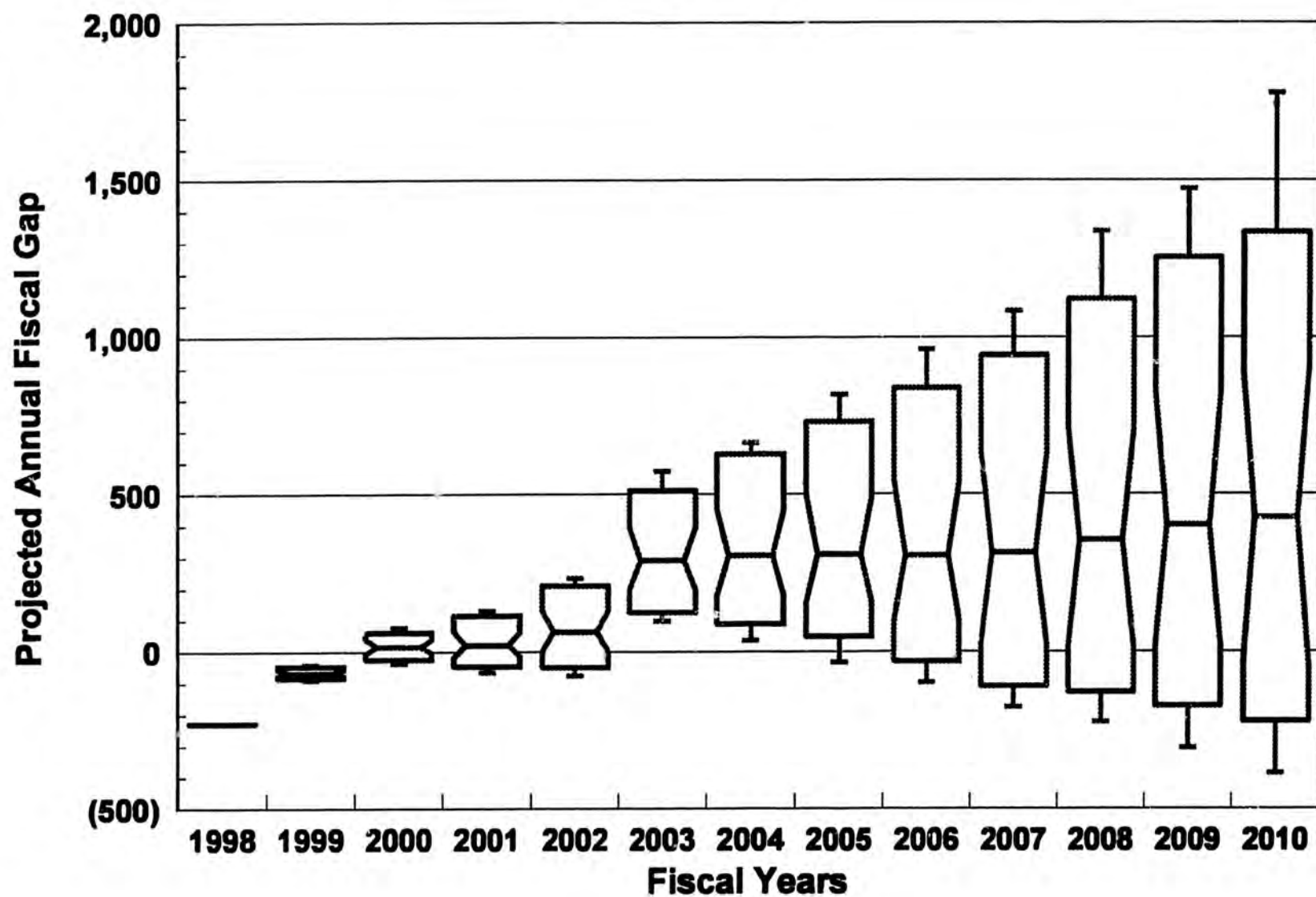
Projected Annual Fiscal Gap Conservative Asset Allocation



Projected Annual Fiscal Gap Current Asset Allocation



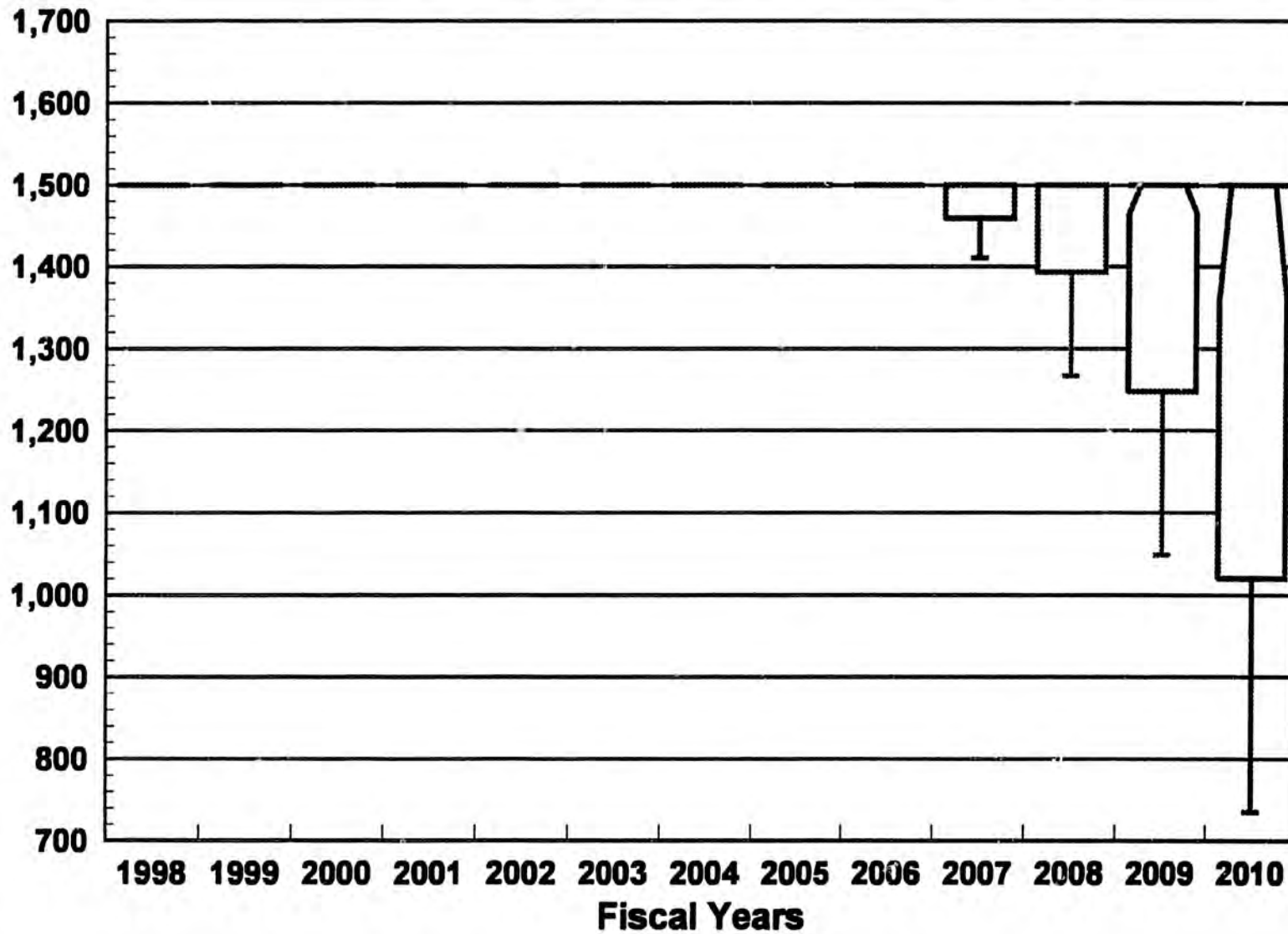
Projected Annual Fiscal Gap 70% Equity Allocation



Constitutional Budget Reserve Ending Balance Conservative Asset Allocation

Callan Associates Inc.

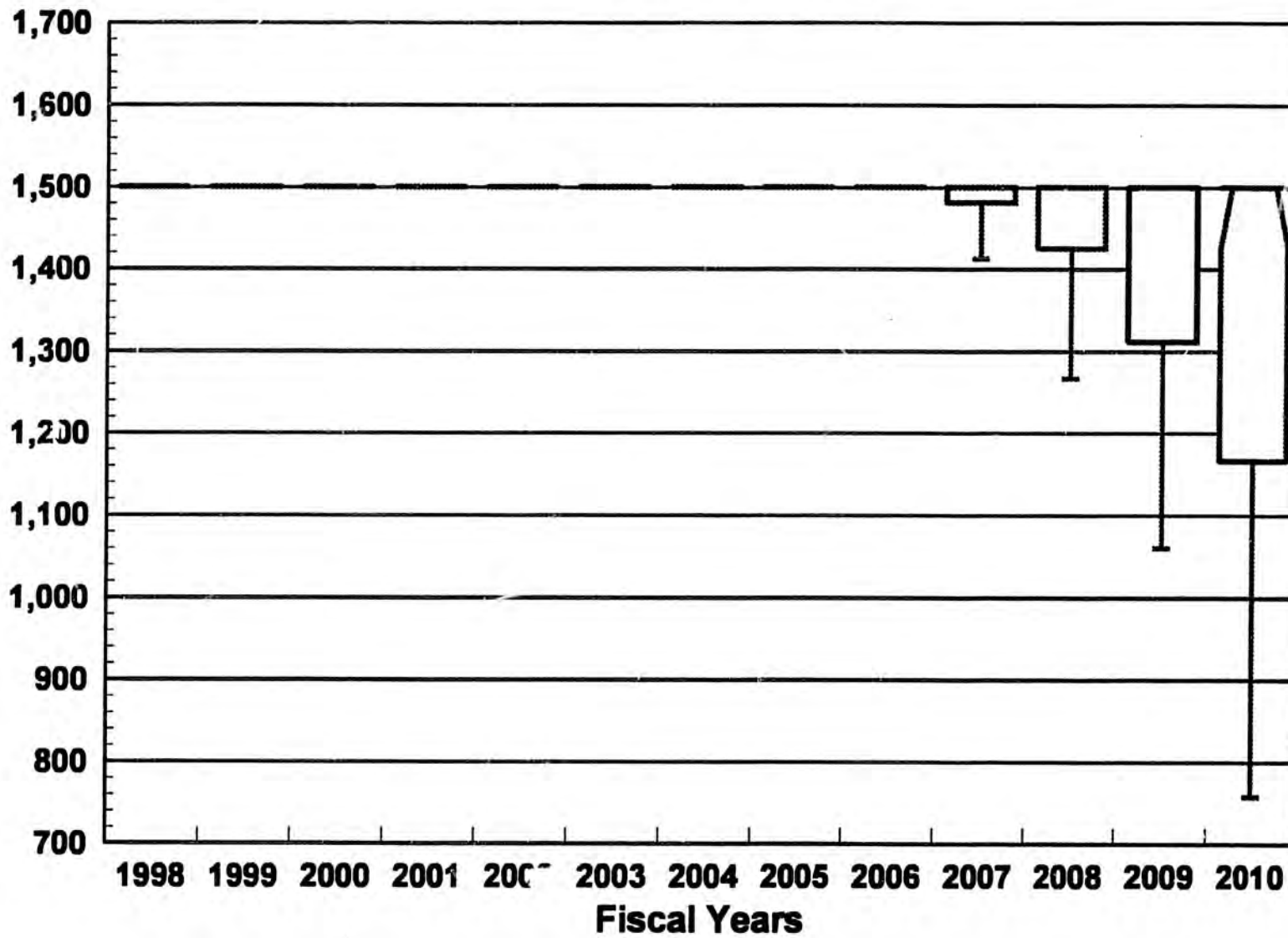
Constitutional Budget Reserve Ending Balance (\$Mil)



Constitutional Budget Reserve Ending Balance Current Asset Allocation

Callan Associates Inc.

Constitutional Budget Reserve Ending Balance (\$Mil)



Constitutional Budget Reserve Ending Balance 70% Equity Allocation

Callan Associates Inc.

Constitutional Budget Reserve Ending Balance (\$Mil)

