Generating Better Risk-Adjusted Returns

Using Margin on Low Volatility Asset Classes

Margin

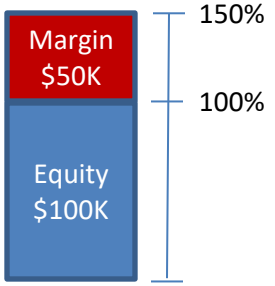
Basic Concepts

- Margin is a type of leverage.
- Buying on margin is the process of purchasing securities with cash borrowed from a broker, using the securities in your portfolio as collateral.
- When the investments are liquidated, the investor pays back the amount borrowed and keeps any gains (or absorbs losses).
- The use of margin will always increase volatility. The incremental increase in volatility is dependent on the underlying volatility of the portfolio. All other things being equal, the higher the volatility of the underlying portfolio, the higher the incremental level of risk will be for a given level of margin.
- Margin can be a powerful tool if used correctly, however it may not be appropriate for all investors.

Margin

Basic Concepts

- Let's assume an investor has $100K portfolio (equity). The investor then borrows $50K at 6% which is also invested in the market.
- The investor is 150% invested:
  - 100% Equity
  - 50% Margin
- The annual cost of margin is $50K * 6% or $3K per year.



Calculating the Impact of Margin on Risk and Returns

It is important to understand the impact of margin on volatility and returns.

- **Volatility** - The Standard Deviation (SD) of a margined position can be calculated by:

$$SD_{Margined} = SD_{Unmargined}\, x\, (1 + Margin\,\%)$$

- **Returns** - Estimating the annualized return (AR) on a margined position can be calculated by :

$$AR_{Margined} = AR_{Unmargined}\, x\, (1 + Margin\,\%) - (Margin\,\% * Cost\ of\ Margin)$$

Calculating the Impact of Margin on Risk and Returns

Assuming 150% Invested (100% Equity / 50% Borrowed)

SD Unmargined	Margin %	SD Margined[(1)]
0.0%	50%	0.0%
0.5%	50%	0.8%
1.0%	50%	1.5%
2.5%	50%	3.8%
3.0%	50%	4.5%
3.5%	50%	5.3%
4.0%	50%	6.0%
4.5%	50%	6.8%
5.0%	50%	7.5%
5.5%	50%	8.3%
6.0%	50%	9.0%

[(1)] $SD_M = SD_{UM} * (1 + \text{Margin \%})$

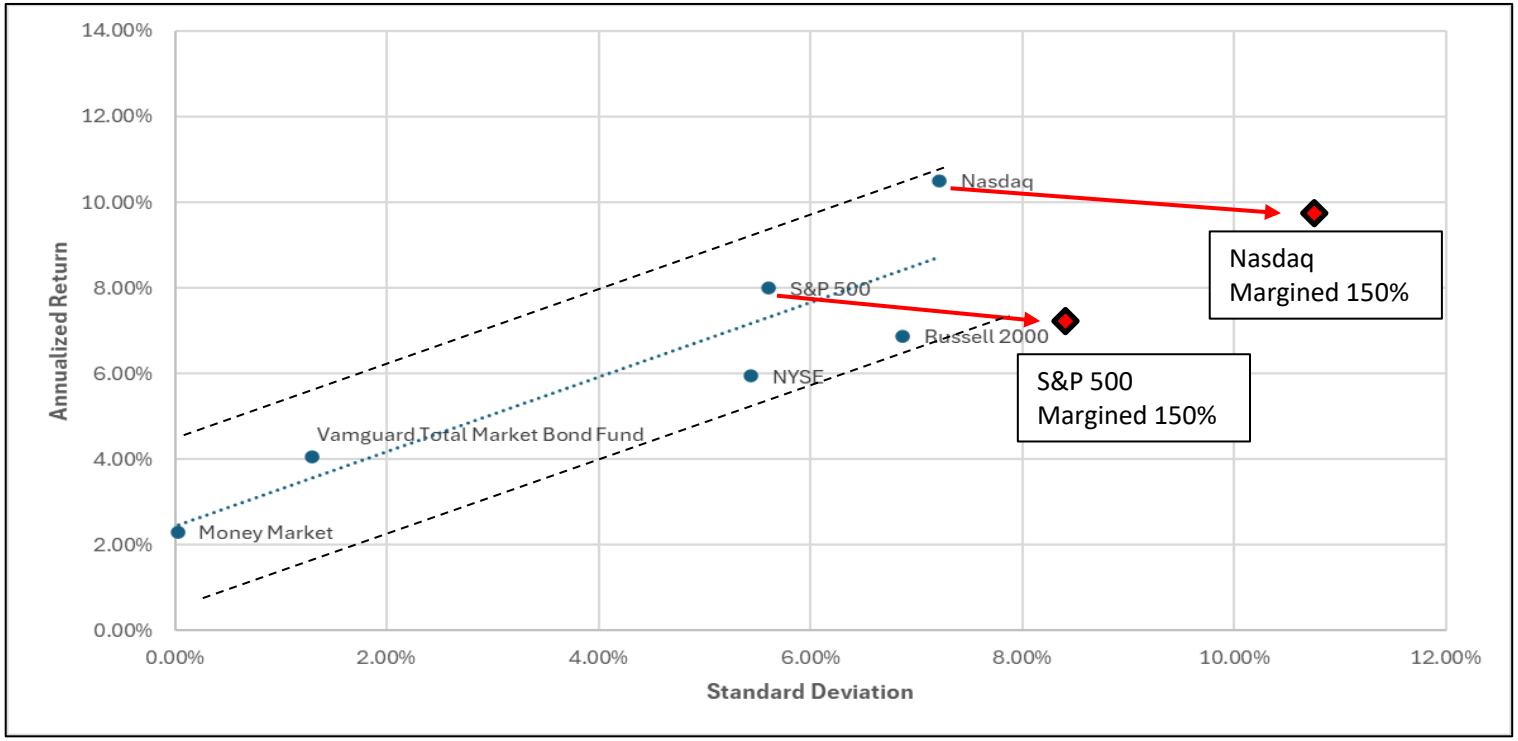
Estimated Return Unmargined	Margin %	Cost of Margin	Estimated Return Margined [(2)]
25%	50%	6%	34.50%
20%	50%	6%	27.00%
15%	50%	6%	19.50%
10%	50%	6%	12.00%
5%	50%	6%	4.50%
0%	50%	6%	-3.00%
-5%	50%	6%	-10.50%
-10%	50%	6%	-18.00%
-15%	50%	6%	-25.50%
-20%	50%	6%	-33.00%
-25%	50%	6%	-40.50%

[(2)] $\text{Return}_M = \text{Return}_{UM} * (1 + \text{Margin \%}) - (\text{Margin \%} * \text{Cost of Margin})$

- Margin increases both returns and volatility.
- Using margin is most beneficial when the unmargined return exceeds the cost of borrowing.
- Low volatility assets make margin more manageable.

Impact of Margin on High Volatility Investments

Risk vs. Reward (12/31/1996 – 12/31/2025)

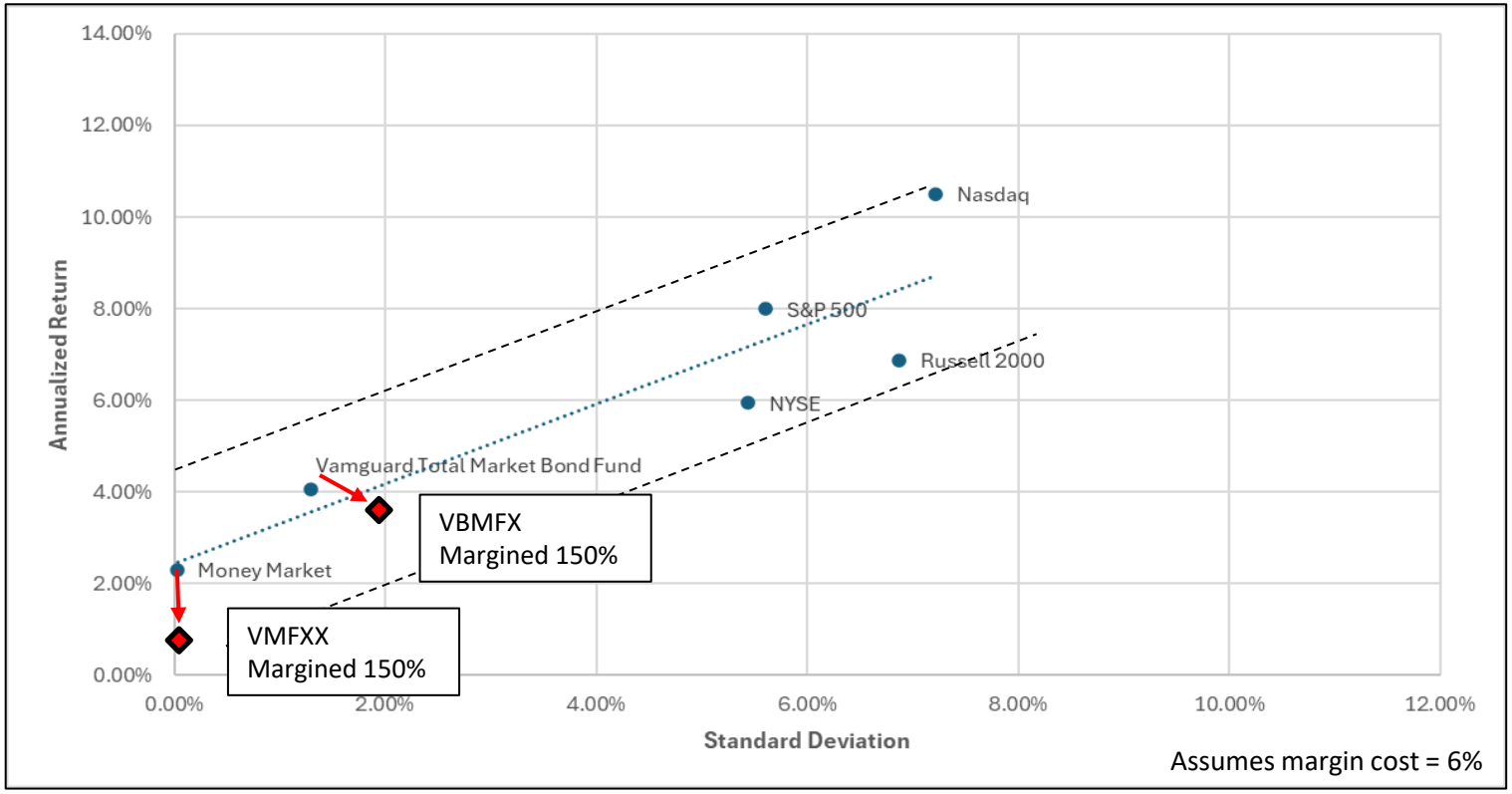


Assumes margin cost = 6%

- Margin **magnifies volatility** when applied to already volatile assets
- The portfolio moves **down and to the right** on the risk/return chart
- Understanding portfolio volatility is **critical before using leverage**

Impact of Margin on Low Volatility Investments

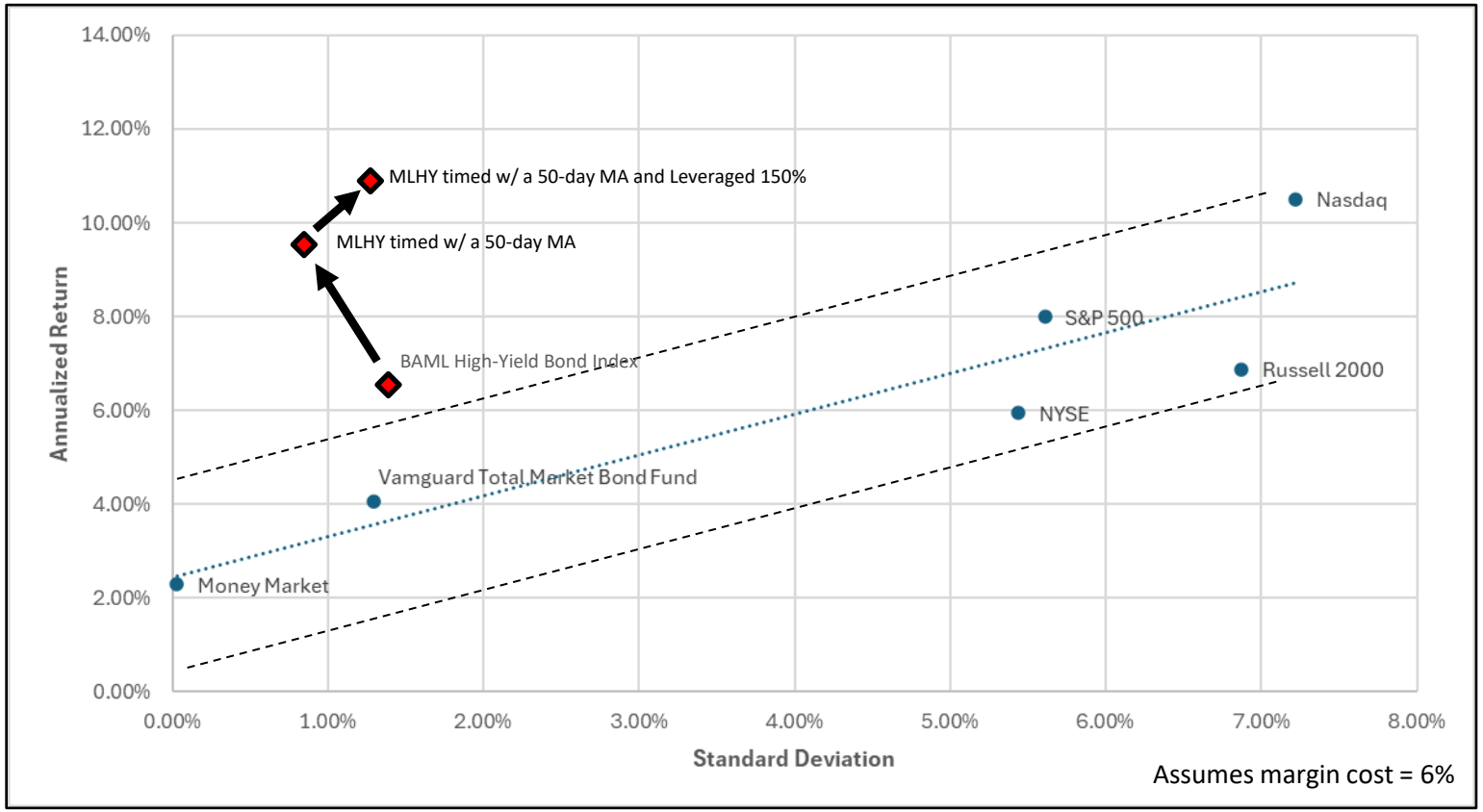
Risk vs. Reward (12/31/1996 – 12/31/2025)



- Margin requires **returns greater than borrowing costs**
- Low volatility alone **does not make margin effective**
- The best candidates for leverage combine **low volatility and strong returns**

Junk Bonds

Risk vs. Reward (12/31/1996 – 12/31/2025)

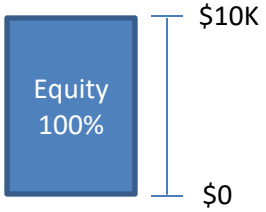


- Margin works best on **strong risk-adjusted return strategies**
- **T**iming + leverage can move portfolios **up and to the left**
- **Asset characteristics matter** when using leverage – understand the underlying volatility characteristics of your portfolio

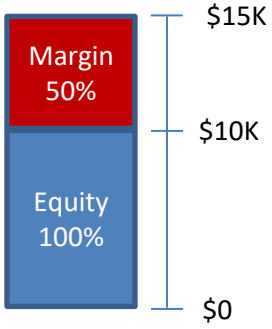
Understanding Margin

Using Margin on Mutual Funds

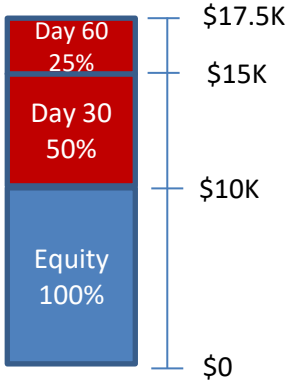
- Day 1: Purchase mutual funds with 100% investor equity. No borrowing.



- Day 30: After 30 days, you can use the mutual fund positions purchased on Day 1 as collateral for borrowing from your broker. Generally, you can borrow up to 50% of the initial equity invested.



- Day 60: The mutual funds purchased on Day 30 are now "seasoned" and eligible to be used as collateral for additional borrowing. You can borrow another 25% (50% of the 50% purchased on Day 30). You are now 175% invested. You have $17.5K invested in the market with an original equity amount of $10K.
- Theoretically, you can invest 200% of the original equity in mutual funds.

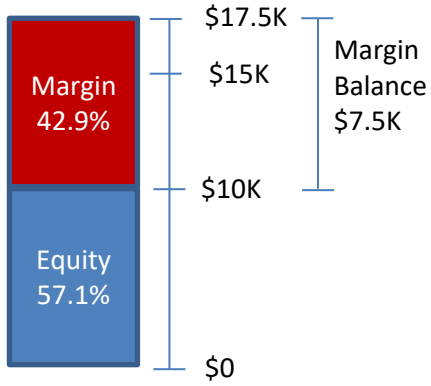


Understanding Margin

Margin Maintenance Value

- Margin Maintenance Value (MMV) is the equity % of the portfolio. It is calculated as:

$$\text{MMV} = \frac{Market\ Value - Margin\ Balance}{Market\ Value}$$



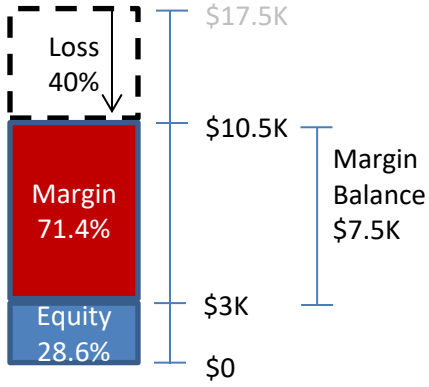
- On Day 60 in the previous example, the MMV would be:

$$\text{MMV} = \frac{Market\ Value - Margin\ Balance}{Market\ Value} = \frac{\$17.5K - \$7.5K}{\$17.5K} = 57.1\%$$

- Most brokers require a MMV greater than 30% to be maintained. Otherwise a margin call may be issued.

- In our example, a 40% portfolio decline would create a decline in the margin maintenance value (MMV) below 30%. This would likely create a margin call.

$$\text{MMV} = \frac{Market\ Value - Margin\ Balance}{Market\ Value} = \frac{\$10.5K - \$7.5K}{\$10.5K} = 28.6\%$$



Impact of Market Declines on Margin Maintenance Values

Assumes 200% invested (100% equity / 100% borrowing)

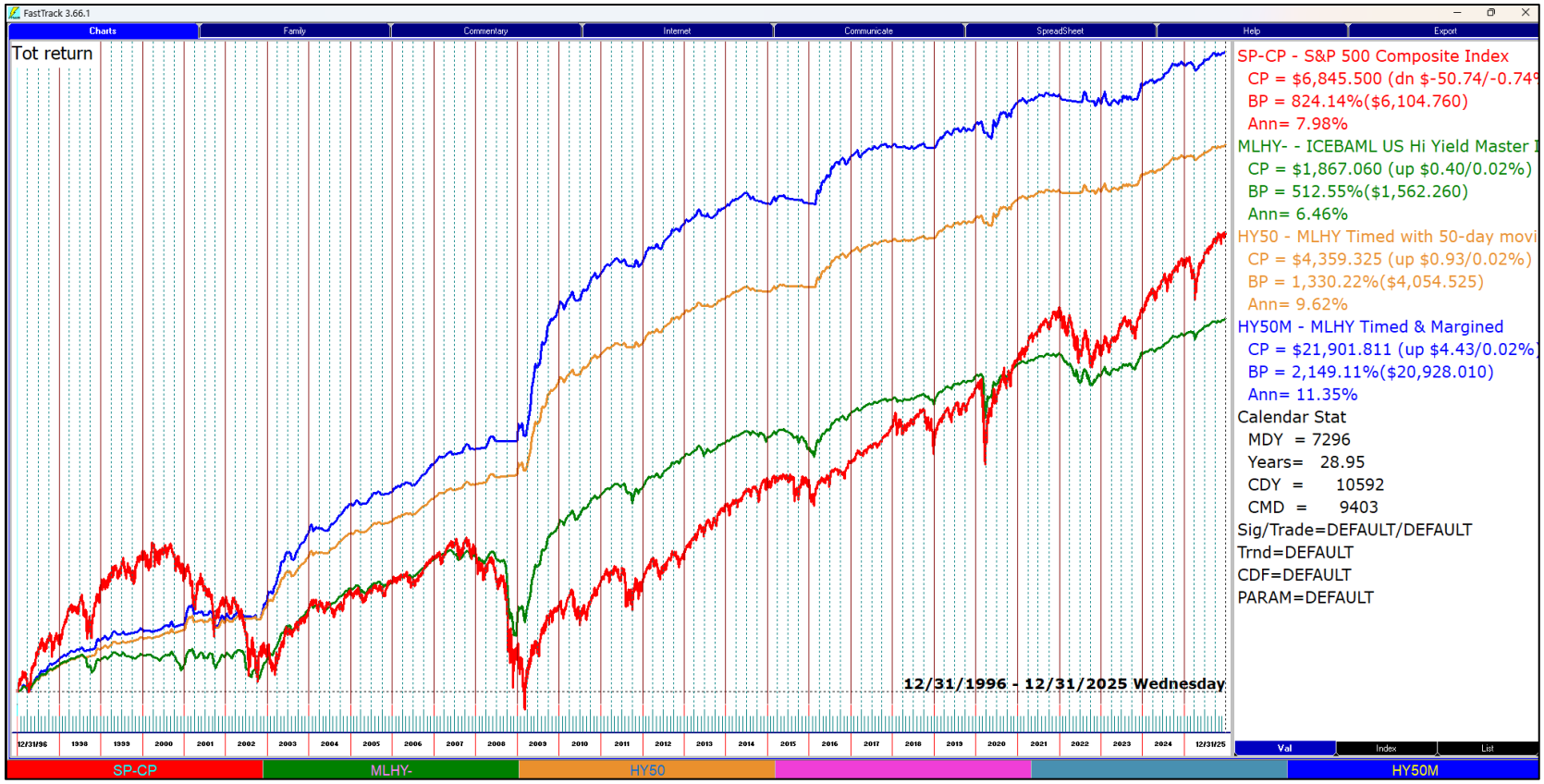
Portfolio Decline	Market Value	Margin Balance	Equity Value	Margin Maintenance Value (MMV)[1]
0%	20,000	10,000	10,000	50.00%
5%	19,000	10,000	9,000	47.37%
10%	18,000	10,000	8,000	44.44%
15%	17,000	10,000	7,000	41.18%
20%	16,000	10,000	6,000	37.50%
25%	15,000	10,000	5,000	33.33%
30%	14,000	10,000	4,000	28.57%
35%	13,000	10,000	3,000	23.08%
40%	12,000	10,000	2,000	16.67%
45%	11,000	10,000	1,000	9.09%
50%	10,000	10,000	0	0.00%

[1]MMV = (Market Value – Margin Balance) / Market Value

- This example involves a highly leveraged portfolio that is 200% invested. A portfolio decline of over 25% will create a situation where the margin maintenance value (MMV) falls below 30%, creating a margin call with most brokers.
- How do you think a disciplined investment approach involving the timing of junk bond (or other low volatility) mutual funds would perform in a margined portfolio?

Junk Bonds – Timed and Margined

12/31/1999 – 12/31/2025



	Ann Ret	SD	UI	UPI	Max DD
S&P 500 Index (SP-CP)	7.98%	5.57%	17.42	0.41	-56.78%
ML High Yield Master II Index (MLHY-)	6.46%	1.40%	5.25	1.07	-34.99%
MLHY Index Timed w/ 50-day MA (HY50)	9.62%	0.83%	1.20	7.33	-5.94%
MLHY Index Timed & Margined	11.35%	1.25%	2.47	4.26	-10.22%

Summary

- Margin may not be appropriate for all investors.
- If you are not experienced with margin, use it gradually.
- Use margin with low volatility portfolios.
- Margining a low volatility portfolio can be less volatile than a non-margined portfolio of equity investments or even a balanced (bond/equity) portfolio.
- Use margin to purchase investments with an expected rate of return that is more than two times the margin rate.
- Mutual funds are not immediately marginable; they must be held in your account for 30 days for investors to use them to borrow against. Consider doing exchanges within a fund family to keep mutual fund holdings "seasoned".
- Junk bond ETFs may be immediately marginable on some platforms, however they are more volatile.
- Margin is generally available in non-qualified accounts; using margin in qualified (tax-deferred or tax free) accounts can create UBTI (Unrelated Business Taxable Income).

If you have any questions about the presentation, feel free to contact:

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