

CONSISTENT VS. VARIABLE POSITION SIZING

"Compound interest is the eighth wonder of the world. He who understands it, earns it... he who doesn't... pays it."

- A. Einstein, notable former New Jersey resident

Understanding how returns compound over time is an often-overlooked aspect of position sizing and thus portfolio optimization. A key insight for any investment strategy with a positive “edge” (i.e., an investment strategy designed to maximize the probability of positive returns while minimizing the likelihood of losses) is that smaller, consistent position sizes usually result in better outcomes than larger, variable position sizes. This is due to “volatility drag,” where big return swings erode long-term growth, even if the average return is identical. Simply put, slow and steady wins the race in compounding.

WHY CONSISTENCY BEATS VARIABILITY

Gains and losses are not symmetric.¹ To illustrate the concept of volatility drag, consider a two-period thought experiment. A 20% gain followed by a 20% loss (in any order) results in a net decline of 4%. ($1.20 \times 0.80 = 0.96$). Now consider the same thought experiment but with a 10% gain and a 10% loss. The net result is a loss of just 1% ($1.10 \times 0.90 = 0.99$). The practical implication of this observation is that larger position sizes tend to amplify volatility drag.

Trading Context

In a strategy with a positive edge, variable position sizes create uneven returns where big wins and losses are mixed with smaller wins and losses. Fixed position sizes may help reduce return volatility (uneven returns mentioned previously) and have the ability to enhance the compounding effect in the long term.

Research Confirms This²

Volatility drag reduces long-term returns because geometric mean falls below arithmetic mean as variance increases. Fixed sizing helps control this in practice.

¹ Quantified Investment Strategies. The Risks of Hyper-Concentration: Volatility Drag and the Probability of Sub-5% Returns. <https://www.quantifiedstrategies.com/volatility-drag/>

² Volatility Drag And Its Impact On (Arithmetic) Investment Returns In Monte Carlo Analysis. <https://www.kitces.com/blog/volatility-drag-variance-drain-mean-arithmetic-vs-geometric-average-investment-returns/#:~:text=The%20inevitable%20gap%20between%20the,actual%20geometric%20mean%20of%206.94%25.>

COMPOUNDING EDGE

Educational Piece



THE MATH BEHIND IT

Compounded (Geometric) Return = $((1+r_1) \times (1+r_2) \times \dots \times (1+r_n))^{(1/n)} - 1$

Where r is the return for the time period and n is the number of time periods

Average (Arithmetic) Return = $\frac{(r_1 + r_2 + \dots + r_n)}{n}$

Where r is the return for the time period and n is the number of time periods

Approximation³

$$R_n = R_p - 1/2(\sigma_n^2)$$

Where R_n is the Geometric Return, R_p is the Arithmetic Return, and σ_n^2 is the variance of the returns

Example: 60% win rate over 10 trades (6 wins, 4 losses)

Variable Sizing

Returns [-8%, -4%, -2%, -2%, +1%, +1%, +2%, +4%, +8%, +8%]

Arithmetic Return $\frac{(-0.08 - 0.04 - 0.02 - 0.02 + 0.01 + 0.01 + 0.02 + 0.04 + 0.08 + 0.08)}{10} = 0.08\%$

Geometric Return $((0.92) \times (0.96) \times (0.98) \times (0.98) \times (1.01) \times (1.01) \times (1.02) \times (1.04) \times (1.08) \times (1.08))^{(1/10)} - 1 = 0.6847\%$

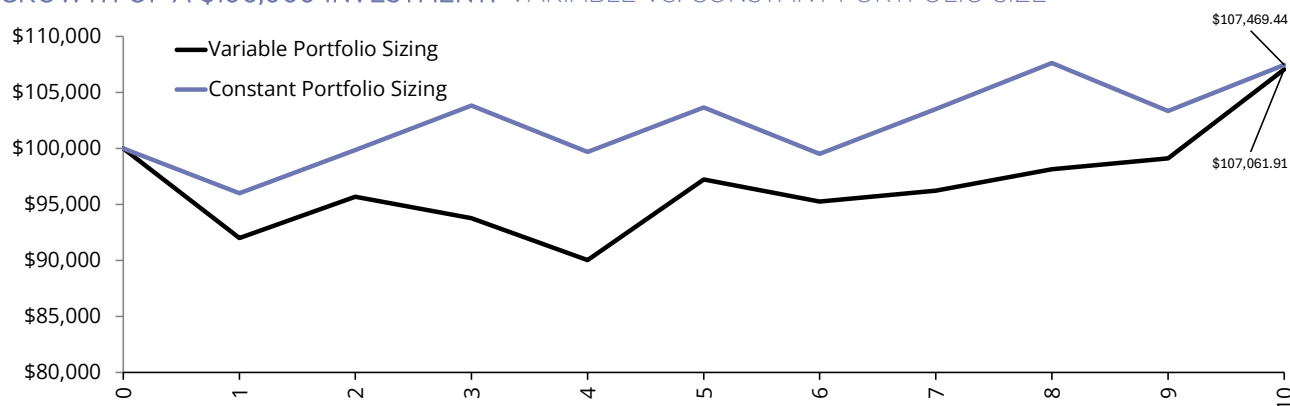
Constant Sizing

Returns [-4%, -4%, -4%, -4%, +4%, +4%, +4%, +4%, +4%, +4%]

Arithmetic Return $\frac{(-0.04 - 0.04 - 0.04 - 0.04 + 0.04 + 0.04 + 0.04 + 0.04 + 0.04 + 0.04)}{10} = 0.08\%$

Geometric Return $(0.96^4 \times 1.04^6)^{(1/10)} - 1 = 0.7230\%$

GROWTH OF A \$100,000 INVESTMENT: VARIABLE VS. CONSTANT PORTFOLIO SIZE⁴



For the same Average (Arithmetic) Return, higher variability lowers the Compounded (Geometric) Return. The consistent approach leads to a better total outcome because lower return variance preserves more capital for compounding.

³ Determining the Return-Maximizing Portfolio Leverage and its Limitations. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2717074

⁴ Source: Embassy calculations.

KEY TAKEAWAYS

An often overlooked driver of long-term wealth is how returns compound over time and position sizing can play an important role:

- An investment with lower volatility of returns will outperform an investment with large swings in both returns and losses if the average returns are the same.
- A portfolio with consistent/fixed position sizes will typically outperform a portfolio with variable positions by reducing volatility drag and allowing compounding to work more efficiently.

If your investment strategy has a positive edge, “slow and steady” position sizing helps capture more of that edge over time. Chasing bigger trades can look appealing, but consistency builds wealth more reliably.

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