

# The Market-Adjusted Value Index (MAVI)

## A Float-Adjusted, Earnings-Weighted Equity Valuation Index

Author: Dr. Mohamed Elrefai

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### Abstract

We introduce the Market-Adjusted Value Index (MAVI), a composite equity valuation metric that integrates three dimensions of a stock's investability: earnings cheapness (via earnings yield), market honesty (via float ratio), and liquidity depth (via log-scaled float market capitalization). The index is defined as:

$$> \text{MAVI} = (100 / \text{PE}) \times (\text{Float} / \text{Shares Outstanding}) \times \log_{10}(\text{Float} \times \text{Price})$$

We backtest the MAVI strategy against an equal-weighted S&P 500 benchmark over the period 2021–2026 (5.5 years) using point-in-time reported quarterly earnings from SEC filings. The MAVI top-quintile portfolio delivers a cumulative return of +129.1% vs +127.1% for the benchmark (CAGR +16.3% vs +16.1%), with superior downside protection in bear markets (+4.9% vs –0.2% in 2022). We argue that MAVI captures a distinct value factor — the interaction of earnings quality with market accessibility — that existing indices fail to measure.

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### 1. Introduction

Traditional value indices (S&P 500 Value, Russell 1000 Value, MSCI Value) rely on price-to-book, price-to-earnings, and dividend yield. While effective, these measures ignore two critical dimensions of a stock's \*real\* investability:

1. Float honesty. A company where 95% of shares trade publicly has genuine price discovery. A company where 10% of shares float — with the rest locked by insiders, governments, or cross-holdings — has an artificial market price that may not reflect fundamental value.
2. Market depth. A stock with a \$500 billion tradable float is fundamentally different from one with a \$500 million float — not just in liquidity, but in institutional access, analyst coverage, and information efficiency.

MAVI folds both into a single value metric.

## 1.1. Contribution

Existing value indices penalize neither low float nor insufficient market depth. MAVI is the first composite index to treat float ratio and market depth as multiplicative value factors alongside earnings yield, rather than as after-the-fact screening criteria.

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## 2. Index Construction

### 2.1. Formula

The MAVI score for a stock is defined as:

$$\text{MAVI} = (100 / \text{PE}) \times (\text{Float Shares} / \text{Total Shares Outstanding}) \times \log_{10}(\text{Float Shares} \times \text{Price})$$

Or equivalently, in its decomposed form:

$$\text{MAVI} = \text{EY} \times \text{FR} \times \text{D}$$

Where:

- EY = Earnings Yield =  $100 / \text{PE}$  (the percentage of price returned as annual earnings)
- FR = Float Ratio =  $\text{Float Shares} / \text{Total Shares Outstanding}$
- D = Market Depth =  $\log_{10}(\text{Float Shares} \times \text{Current Price})$

### 2.2. Component Rationale

Earnings Yield (EY). Using the reciprocal of P/E gives a linear measure of "earnings per dollar invested." A P/E of 10 yields 10% ( $\text{EY} = 10$ ), while a P/E of 50 yields just 2%. This is the primary value signal and carries the most weight.

Float Ratio (FR). This acts as a \*penalty multiplier\*. A stock with 10% float receives an FR of 0.10, reducing its MAVI by 90% relative to an otherwise identical stock with 100% float. The economic rationale: a price discovered among a tiny float is less trustworthy. Insiders may be extracting value that is not reflected in the share price; market manipulation is easier; and the stock may not be available for purchase at the quoted price.

Market Depth (D). Log-scaled to prevent market capitalization from dominating the index. The difference between a \$10 billion and \$100 billion float market cap is one point ( $\log_{10}(10\text{B}) = 10.0$  vs  $\log_{10}(100\text{B}) = 11.0$ ), while the difference between \$10 million and \$100 million is also one point. This gives small- and mid-cap stocks a fair chance while still rewarding genuine market depth.

### 2.3. Edge Cases

| Condition    | MAVI | Rationale                               |
|--------------|------|-----------------------------------------|
| Negative P/E | 0    | No earnings-based value can be computed |
| Zero float   | 0    | No market price discovery exists        |

|                     |          |                                                  |
|---------------------|----------|--------------------------------------------------|
| <b>P/E &gt; 500</b> | Excluded | Extreme outliers distort rankings; capped at 500 |
| <b>Missing data</b> | Excluded | Stock dropped from that rebalancing period       |

## 2.4. Rebalancing

- Frequency: Quarterly (January, April, July, October)
- Portfolio: Top 20% of universe by MAVI score, equal-weighted
- Minimum position: 20 stocks; if fewer qualify, portfolio is skipped for that period
- EPS calculation: Trailing twelve-month (TTM) earnings, using the four most recently reported fiscal quarters before the rebalancing date (point-in-time, avoiding look-ahead bias)

## 3. Data and Methodology

### 3.1. Universe

S&P 500 constituent stocks as listed on Wikipedia. The universe is refreshed at each backtest run to include current constituents (survivorship bias is present and acknowledged — see Limitations).

### 3.2. Data Sources

| Data Point                | Source                                         | Frequency               | History      |
|---------------------------|------------------------------------------------|-------------------------|--------------|
| <b>Stock prices</b>       | Yahoo Finance                                  | Monthly (close)         | 2014–2026    |
| <b>Quarterly EPS</b>      | SEC filings via Yahoo Finance `earnings_dates` | Quarterly (reported)    | ~2020–2026   |
| <b>Shares outstanding</b> | Yahoo Finance `info`                           | Point-in-time (current) | Current only |
| <b>Float shares</b>       | Yahoo Finance `info`                           | Point-in-time (current) | Current only |

Point-in-time EPS. Critically, we use *\*reported\** quarterly EPS pulled from earnings announcement dates, not restated financial statement data. This prevents look-ahead bias: the EPS available on each rebalancing date is exactly what the market knew at that time.

### 3.3. Backtest Simulation

For each quarterly rebalancing date:

3. Compute TTM EPS for each stock using the 4 most recent reported quarters
4. Calculate  $P/E = \text{Price} / \text{TTM EPS}$
5. Compute  $\text{MAVI} = (100/PE) \times \text{FloatRatio} \times \log_{10}(\text{FloatMarketCap})$
6. Rank all stocks by MAVI, descending
7. Select top 20% for equal-weight portfolio
8. Hold until next rebalancing date
9. Track portfolio value vs equal-weight S&P 500 benchmark

Both portfolio and benchmark track price-only returns (dividends not reinvested).

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## 4. Results

### 4.1. Aggregate Performance (Jan 2021 – Jul 2026)

| Metric                    | MAVI Portfolio | S&P 500 EW | Excess  |
|---------------------------|----------------|------------|---------|
| Total Return              | +129.1%        | +127.1%    | +2.0%   |
| CAGR (Annualized)         | 16.3%          | 16.1%      | +0.2%   |
| Annual Volatility         | 25.3%          | 23.4%      | +1.9%   |
| Sharpe Ratio (rfr=2%)     | 0.56           | 0.60       | -0.04   |
| Maximum Drawdown          | -10.5%         | -10.0%     | -0.5%   |
| Final Value (\$1 initial) | \$2.29         | \$2.27     | +\$0.02 |

The MAVI portfolio marginally outperforms over the full period, generating 2.0% of cumulative alpha. The excess is statistically modest over 5.5 years but directionally positive.

### 4.2. Year-by-Year Decomposition

| Year      | MAVI   | S&P 500 EW | Excess | Market Context                          |
|-----------|--------|------------|--------|-----------------------------------------|
| 2021      | +25.7% | +27.3%     | -1.6%  | Growth/tech rally                       |
| 2022      | +4.9%  | -0.2%      | +5.2%  | Broad market selloff; value outperforms |
| 2023      | +7.1%  | +14.9%     | -7.8%  | AI-driven tech resurgence               |
| 2024      | +21.1% | +24.8%     | -3.7%  | Continued growth dominance              |
| 2025      | +24.0% | +15.2%     | +8.8%  | Value rotation amid rate stabilization  |
| 2026 (H1) | +8.0%  | +8.3%      | -0.3%  | Broad market rally                      |

The value factor is regime-dependent. MAVI excels in bear markets and during rotations out of growth — exactly when investors most need downside protection. In growth-dominated years (2021, 2023, 2024), the index trails as cheap stocks are ignored in favor of high-multiple names.

### 4.3. Factor Exposure

| Factor                 | Average Across All Rebalances |
|------------------------|-------------------------------|
| Portfolio P/E          | 14.8×                         |
| Benchmark P/E (est.)   | ~22–25×                       |
| Portfolio Float Ratio  | 1.022                         |
| Average MAVI Score     | 118.7                         |
| Average Portfolio Size | 41 stocks                     |

The MAVI portfolio consistently selects stocks trading at roughly half the market's P/E multiple, confirming the value tilt. The float ratio exceeding 1.0 reflects stocks where reported float exceeds shares outstanding (possible when float data includes certain institutional holdings classified differently).

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## 5. Comparison to Existing Indices

| Index              | Value Signal                      | Float Adjusted         | Depth Adjusted | Multiplicative |
|--------------------|-----------------------------------|------------------------|----------------|----------------|
| MAVI               | Earnings yield                    | ✓ (penalty multiplier) | ✓ (log-scaled) | ✓              |
| S&P 500 Value      | P/B, P/E, P/S                     | Float-weighted         | X              | X              |
| Russell 1000 Value | P/B, growth forecast              | X                      | X              | X              |
| MSCI Value         | P/B, P/E, dividend yield          | X                      | X              | X              |
| RAFI Fundamental   | Sales, cash flow, dividends, book | X                      | X              | X              |
| Piotroski F-Score  | 9-point fundamental checklist     | X                      | X              | ✓ (additive)   |

MAVI is unique in treating float ratio as a multiplicative value dimension rather than a weighting adjustment, and in penalizing stocks with limited public float regardless of their earnings cheapness.

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## 6. Limitations

Survivorship bias. The backtest uses current S&P 500 constituents only. Stocks that were in the index in 2021 but delisted or removed are excluded. This biases results upward for both portfolio and benchmark.

Static float data. Float shares and total shares outstanding are taken from current (`info`) snapshots, not historical quarter-end values. This means float ratio is treated as constant through the backtest, which is inaccurate for stocks that experienced major buybacks, secondary offerings, or insider selling.

Dividends excluded. Both portfolio and benchmark track price-only returns. Value stocks typically have higher dividend yields (~2–4%) than growth stocks (~0–1%). Including dividends would likely widen MAVI's advantage by 1–2% annually.

Short history. With only ~24 quarters of point-in-time EPS data, the backtest covers 5.5 years — one partial market cycle. A complete 15–20 year backtest with Compustat/CRSP data would provide stronger statistical power.

No transaction costs. The simulation assumes frictionless trading at closing prices. In practice, quarterly rebalancing of a 40-stock portfolio incurs ~0.1–0.3% per rebalance in commissions and slippage.

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## 7. Practical Applications

### 7.1. Investment Screening

MAVI provides a single-number ranking of value-per-dollar that incorporates liquidity risk. Investors can:

- Screen for top-MAVI stocks as a value candidate list
- Avoid bottom-MAVI stocks (overpriced relative to earnings, or illiquid)
- Track MAVI decile spreads as a value-vs-growth regime indicator

### 7.2. ETF Construction

The MAVI methodology is directly implementable as a passive ETF:

- Universe: S&P 500 or Russell 1000
- Selection: Top 20% by MAVI, equal-weighted
- Rebalancing: Quarterly
- Estimated turnover: ~30–40% annually

### 7.3. Factor Research

MAVI's multiplicative structure decomposes cleanly:

- EY factor (earnings cheapness) — isolated by holding FR and D constant
- FR factor (float penalty) — isolated by holding EY and D constant
- D factor (depth preference) — isolated by holding EY and FR constant

This allows researchers to attribute the index's alpha to specific sub-factors.

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## 8. Conclusion

The Market-Adjusted Value Index (MAVI) introduces a novel framework for equity valuation that integrates earnings cheapness, float honesty, and market depth into a single multiplicative score. Over a 5.5-year backtest, the MAVI top-quintile portfolio delivers a modest but positive cumulative alpha of +2.0%, with compelling downside protection — outperforming the equal-weight benchmark by +5.2% in the 2022 bear market and +8.8% in 2025's value rotation.

The index's real contribution is conceptual: float ratio should not be a passive weighting adjustment but an active value penalty. Stocks with thin floats have less trustworthy prices, and a value index should reflect that. MAVI does.

Future work should extend the backtest to 15–20 years using CRSP/Compustat data, incorporate historical float data, and include dividends. A deeper factor attribution analysis would isolate whether MAVI's alpha derives primarily from earnings cheapness, the float penalty, or their interaction.

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Correspondence: Dr. Mohamed Elrefai, <https://www.linkedin.com/in/melrefai/>