

Market Multiples Valuation

[linkedin.com/in/denis-beliaev](https://www.linkedin.com/in/denis-beliaev) 
[instagram.com/geekkon_x](https://www.instagram.com/geekkon_x) 
Belyaevda.gk@gmail.com 

Python-based financial analysis tool that performs relative valuation of companies using peer-based market multiples methodology. This script calculates fair values for individual stocks and entire ETFs by comparing them to comparable companies using industry-standard valuation metrics.



Multi-Method Valuation



Global Market Support



Performance Optimized



Comprehensive Analysis

Github: github.com/dbeliaev-tum/multiples_valuation.git

[linkedin.com/in/denis-beliaev](https://www.linkedin.com/in/denis-beliaev)

Introduction

This program evaluates individual stocks (from CSV portfolios or target lists) and ETFs using multiples analysis methodology.

Methodology Note

Multiples analysis depends on peer company comparisons and assumes market valuations of comparable firms are reasonable. This approach supplements rather than replaces fundamental analysis in investment decision-making.

- **Multi-Currency:** automatic conversion to EUR using live exchange rates
- **International Tickers:** support for global stock exchanges (US, EU, Japan, etc.)
- **Localized Number Formatting:** handles European decimal separators



- **Parallel Processing:** concurrent data fetching using ThreadPoolExecutor
- **Intelligent Caching:** LRU caching to minimize API calls and improve performance



- **Peer Comparison:** automated comparable company analysis
- **ETF Valuation:** bottom-up ETF valuation aggregating constituent stocks
- **Weight Redistribution:** Automatic adjustment when valuation methods are unavailable
- **Detailed Reporting**



Algorithm

1

Data Collection Phase

- Fetches real-time financial data from Yahoo Finance API
- Retrieves key metrics: Price, Shares, Debt, Cash, EBITDA, Revenue, EPS
- Converts all currencies to EUR

2

Peer Analysis Phase

- Calculates valuation multiples for each peer company
- Applies statistical filtering to remove outliers
- Computes average multiples for each valuation method

3

Valuation Phase

- Applies peer multiples to target companies
- Uses weighted average of available methods
- Automatically redistributes weights when methods are unavailable

4

Reporting Phase

- Generates comprehensive valuation results
- Calculates premium/discount percentages
- Provides detailed method-level breakdowns

Multiples

EV/EBITDA

Enterprise Value / EBITDA

- Capital-intensive businesses
- Debt-adjusted valuation

$$\text{Fair Price} = (\text{Peer EV/EBITDA} \times \text{Company EBITDA} - \text{Debt} + \text{Cash}) / \text{Shares}$$

P/E Ratio

Price / Earnings per Share

- Profitable companies
- Earnings power focus

$$\text{Fair Price} = \text{Peer P/E} \times \text{Company EPS}$$

P/S Ratio

Price / Sales per Share

- Growth companies
- Revenue-based valuation

$$\text{Fair Price} = \text{Peer P/S} \times (\text{Company Revenue} / \text{Shares})$$

Dictionaries

Dictionary mapping stock portfolio names to file paths

```
stocks_dict = {  
    "Sample": "sample_deals_yahoo.csv"  
    "Test": "test_deals_yahoo.csv"  
    ...  
}
```

Dictionary mapping ETF names to CSV file paths

```
etf_dict = {  
    "DAX": "Investments - DAX.csv",  
    "POLAND": "Investments - POLAND.csv",  
    ...  
}
```

**Keys: Target company tickers,
Values: Lists of peer company tickers**

```
companies_to_value = {  
    "KO": ["PEP", "KDP", "MNST"],  
    "MSFT": ["ORCL", "SAP.DE", "ADBE", "NOW"],  
    "AAPL": ["MSFT", "GOOGL"],  
    "NESN.SW": ["UL", "RBGLY", "DANOY", "MDLZ"],  
  
    "PKO.WA": ["SAN.MC", "DBK.DE", "CBK.DE"],  
    "PKN.WA": ["REP.MC", "ENI.MI", "TTE.PA"],  
    "PZU.WA": ["ALV.DE", "CS.PA", "MUV2.DE"],  
    "PEO.WA": ["SAN.MC", "DBK.DE", "CBK.DE"],  
    ...  
}
```

CSV File Format

date	ticker	title	industry		price_ev_w	price_pe_w	price_ps_w
24.02.2025	KO	Coca-Cola Co	Consumer Staples		0.283	0.47	0.25
02.04.2025	MSFT	Microsoft Corp	Information Technology	...	0.183	0.35	0.47
02.05.2025	NESN.SW	Nestle SA	Consumer Staples		0.283	0.47	0.25

...

Column	Type	Description	Example
ticker	String	Stock symbol	"AAPL"
price_ev_w	Decimal (0-1)	Weight for EV/EBITDA valuation	0.183
price_pe_w	Decimal (0-1)	Weight for P/E valuation	0.35
price_ps_w	Decimal (0-1)	Weight for P/S valuation	0.467

CSV ETF File Format

	ticker	title	industry	share	price_ev_w	price_pe_w	price_ps_w
	PKO.WA	Powszechna Kasa Oszczednosci Bk Plski SA	Financials	0.1885	0.017	0.583	0.4
	PKN.WA	Orlen SA	Energy	0.1201	0.5	0.3	0.2
	PZU.WA	Powszechny Zaklad Ubezpieczen SA	Financials	0.1030	0.017	0.583	0.4
	PEO.WA	Bank Polska Kasa Opieki SA	Financials	0.1020	0.017	0.583	0.4
		...					

Column	Type	Description	Example
ticker	String	Stock symbol	"AAPL"
share	Decimal (0-1)	Share of the company in ETF	0.33
price_ev_w	Decimal (0-1)	Weight for EV/EBITDA valuation	0.183
price_pe_w	Decimal (0-1)	Weight for P/E valuation	0.35
price_ps_w	Decimal (0-1)	Weight for P/S valuation	0.467

Multiples valuation

===== PROCESSING: Sample (sample_deals_yahoo.csv) =====

- ✓ Successfully processed 15 records from file 'sample_deals_yahoo.csv'
- ✓ Loaded weights for 15 companies from Sample

===== VALUATION: The Coca-Cola Company (KO) - Sample *

[Sample] Fetching peer company data for KO...
[Sample] Peers found: 3
[Sample] Calculating fair price for KO...

--- VALUATION METHODS USED FOR KO ---

- ✓ EV/EBITDA method: weight 0.28
- ✓ P/E method: weight 0.47
- ✓ P/S method: weight 0.25

✓ [Sample] KO - Current: €57.39, Fair: €58.24



===== FINAL VALUATION SUMMARY - ALL STOCKS *

Type	Source	Ticker	Company	Fair Price	Current Price	Difference (%)
Stock	Sample	NESN.SW	Nestlé S.A.	€100.73	€80.02	25.90%
Stock	Sample	KO	The Coca-Cola Company	€58.24	€57.39	1.50%
Stock	Sample	MSFT	Microsoft Corporation	€426.99	€447.67	-4.60%
Stock	Sample	AAPL	Apple Inc.	€186.75	€219.49	-14.90%

*relevant on 07.10.2025

ETF extension

- ✓ Processed file Investments - POLAND.csv: 16 records
- ✓ Tickers added: 16

--- 🔎 Starting ETF analysis with 16 tickers ---

--- VALUATION METHODS USED FOR PKN.WA --- *

- ✓ EV/EBITDA method: weight 0.50
- ✓ P/E method: weight 0.30
- ✓ P/S method: weight 0.20

✓ Successfully valued PKN.WA: price €20.49 → fair €29.29

...



--- 💰 FINAL ETF VALUATION RESULT --- *

- ✓ ETF Current Value: €240.02
- ✓ ETF Fair Value: €284.98
- ✓ Premium/Discount: +18.73%
- ✓ Successfully Valued: 16/16 companies

...

Output

FINAL VALUATION SUMMARY - ALL STOCKS & ETFs *

Type	Source	Ticker	Company	Fair Price	Current Price	Difference (%)
Stock	Test	SAP.DE	SAP SE	€297.83	€235.00	26.70%
Stock	Sample	NESN.SW	Nestlé S.A.	€100.59	€80.02	25.70%
ETF	ETF Portfolio	POLAND	ETF POLAND	€284.81	€239.88	18.70%
Stock	Sample	HDB	HDFC Bank Limited	€33.78	€29.97	12.70%
Stock	Sample	SBUX	Starbucks Corporation	€77.34	€69.76	10.90%
ETF	ETF Portfolio	EURO_BANKS	ETF EURO_BANKS	€34.59	€33.26	4.00%
Stock	Sample	LMT	Lockheed Martin Corporation	€448.43	€438.20	2.30%
Stock	Sample	KO	The Coca-Cola Company	€58.16	€57.32	1.50%
Stock	Test	ALV.DE	Allianz SE	€361.80	€364.30	-0.70%
Stock	Sample	MSFT	Microsoft Corporation	€427.55	€447.65	-4.50%
ETF	ETF Portfolio	DAX	ETF DAX	€219.71	€256.00	-14.20%
Stock	Sample	AAPL	Apple Inc.	€186.70	€219.46	-14.90%
ETF	ETF Portfolio	USHEALTH	ETF USHEALTH	€210.17	€278.77	-24.60%

Total items valued: 21

- ETFs: 4
- Stocks: 17

*relevant on 07.10.2025

Customization

The valuation framework offers flexible parameters to align with your specific investment criteria and risk tolerance. Adjust these settings to refine screening thresholds and optimize performance.

Modify these constants in the script to match your investment philosophy:

```
# Multiplier bounds for outlier filtering  
EV_EBITDA_MAX = 50    # Exclude EV/EBITDA > 50  
P_E_MAX = 100          # Exclude P/E > 100  
P_S_MAX = 40           # Exclude P/S > 40
```

```
# Default weights when not specified  
DEFAULT_WEIGHTS = (0.33, 0.33, 0.33)
```

```
# Threading configuration  
MAX_WORKERS = 10      # Parallel threads for data  
fetching  
API_DELAY = 0.1        # Delay between API calls
```

```
# Caching settings  
CACHE_SIZE = None       # LRU cache size (None = unlimited)
```

Troubleshooting

Missing Data for Some Companies

- Cause: Yahoo Finance may not have complete data for all tickers
- Solution: The script automatically excludes companies with insufficient data

1

API Rate Limiting

- Cause: Too many rapid requests to Yahoo Finance
- Solution: Built-in delays and caching minimize this issue

2

Currency Conversion Failures

- Cause: Exchange rate data temporarily unavailable
- Solution: Falls back to 1:1 conversion with warning

3

CSV Format Issues

- Solution: Ensure exact column names and proper number formatting

4

Conclusion

This Market Multiples Valuation Script provides a robust and scalable tool for quantitative investment analysis. By automating the calculation of relative valuation for individual stocks and entire ETFs, it delivers a systematic, data-driven perspective on market pricing.

The script's core strength lies in its ability to efficiently process large datasets, apply customizable valuation parameters, and clearly highlight potential investment opportunities through its premium/discount output. While multiples analysis serves as a powerful screening mechanism, it is most effective when used to complement, not replace, in-depth fundamental research.

Ultimately, this tool is designed to enhance the decision-making process for equity research and portfolio management by providing a consistent and replicable method for assessing relative value.



Thanks for your attention!

linkedin.com/in/denis-beliaev
instagram.com/geekkon_x
Belyaevda.gk@gmail.com



Github: github.com/dbeliaev-tum/multiples_valuation.git

linkedin.com/in/denis-beliaev