Software Quality Engineering

Assignment 3

Website Under Test

System: **Portfolio Visualizer**
Testing Technique: Black-box testing using Equivalence Class Partitioning (ECP) and Boundary Value Analysis (BVA)
Tester Name: __Uzair Majeed____
Tester Roll Number : ___23i-3063____
Tester Section : ___Section-B____
Date: ___Oct 27,2025____

1. Test Charter (≤1 page)

Purpose

State the main goal of this test effort — for example:
To evaluate the input validation, boundary handling, and error feedback mechanisms of Portfolio Visualizer's analysis and configuration modules using black-box testing techniques (ECP and BVA).

Features/URLs Under Test

List all pages or tools you will test (at least 11 unique forms).

#	Category	Page/Tool Name	URL
1	Authentication	Signup Form	https://www.portfoliovisualizer.com/sign-up

2	Authentication	Login Form	https://www.portfoliovisualizer.com/login
3	Backtest Portfolio	Backtest Portfolio	https://www.portfoliovisualizer.com/backtest-portfolio
4	Factor Analysis	Fund Factor Regression	https://www.portfoliovisualizer.com/etf-and-mutual-fund-factor-regression
5	Asset Analytics	Asset Correlations	https://www.portfoliovisualizer.com/asset-correlations
6	Asset Analytics	Fund Screener	https://www.portfoliovisualizer.com/fund-screener
7	Backtest Portfolio	Manager Performance Analysis	https://www.portfoliovisualizer.com/manager-performance
8	Portfolio Optimization	Portfolio Optimization	https://www.portfoliovisualizer.com/optimize-portfolio
9	Monte Carlo Simulation	Monte Carlo Simulation	https://www.portfoliovisualizer.com/monte-carlo-simulation
10	Tactical Asset Allocation	Tactical Asset Alloation Model	https://www.portfoliovisualizer.com/tactical-asset-allocation-model
11	Configuration	Manage Asset Backflips	https://www.portfoliovisualizer.com/manage-backfills

12	Configuration	Manage Reports	https://www.portfoliovisualizer.com/manage-reports
13	Configuration	Manage Fees	https://www.portfoliovisualizer.com/manage-fees
14	Configuration	Manage Market Expectation	https://www.portfoliovisualizer.com/manage-market-expectations
15	Configuration	Manage Market Regimes	https://www.portfoliovisualizer.com/manage-market-regimes

Key Risks

- Weak or missing input validation for numeric fields (e.g., allocations not summing to 100%).
- Inconsistent error handling for invalid tickers or dates.
- Lack of feedback for incorrect inputs.
- Potential off-by-one or rounding boundary issues.
- Ambiguity in financial result interpretation.

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2. Input Inventory

1. **SIGNUP FORM**

Tool/Page: Sign Up

URL: https://www.portfoliovisualizer.com/sign-up

Field (UI Label)	Type	Observed Constraints / Notes	Dependent on	Default
Profile Type	List (select)	Must choose one option (cannot be blank for submission). Options: Financial Advisor, Institutional Investor, Individual Investor, Academic.	—	—
Country	List (select)	Must select a valid country from dropdown (defaulted to user's geolocation).	—	Pakistan *(preselected)*
Market Region	List (select)	Must choose one region. Options: North America, US, Canada, Europe, UK, Australia, India.	—	North America
First Name	Text	Required field; accepts alphabetic characters. No explicit length limit visible.	—	—
Last Name	Text	Required field; accepts alphabetic characters.	—	—
Business Email	Text (email)	Must be a valid email format (contains @ and domain). Label dynamically changes to "Email"	**Profile Type**	—

		for Individual/Academic profile types.		
Company	Text	Optional field. May be hidden/disabled for Individual/Academic profile types.	**Profile Type**	—
Firm Type	List (select)	Optional for Individual/Academic. Required for business profiles. Options include Asset Manager, Bank, Consulting Company, etc.	**Profile Type**	—
Create Password	Text (password)	Required; should follow password constraints (typically min 8 chars, though not explicitly mentioned).	—	—
Verify Password	Text (password)	Must match “Create Password”.	**Password**	—
reCAPTCHA	Checkbox (verification widget)	Must be completed before submission to validate human user.	—	—

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2. LOGIN FORM

Tool/Page: Login

URL: https://www.portfoliovisualizer.com/login

Field (UI Label)	Type	Observed Constraints / Notes	Dependent on	Default
Email	Text (email)	Required field; must be valid email format	-	-
Password	Text (password)	Required field; case-sensitive	-	-
Stay signed in on this device	Checkbox	Optional; remembers login session	-	Unchecked

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3. BACKTEST PORTFOLIO FORM

Tool/Page: Backtest Portfolio

URL: https://www.portfoliovisualizer.com/backtest-portfolio

Field (UI Label)	Type	Observed Constraints / Notes	Dependent on	Default

Time Period	Dropdown	Month-to-Month / Year-to-Year	—	Year-to-Year
Start Year	Dropdown	1985–2025; must be ≤ End Year	—	1985
End Year	Dropdown	1985–2025; must be ≥ Start Year	—	2025
Include YTD	Dropdown	Yes/No	—	No
Initial Amount	Number	Positive integer (>0)	—	10000
Cashflows	Dropdown	None, Contribute fixed amount, Withdraw fixed amount, Withdraw fixed percentage	—	None
Contribution Amount	Number	>0; appears if Cashflows=Contribute	Cashflows	—
Withdrawal Amount	Number	>0; appears if Cashflows=Withdraw fixed	Cashflows	—
Withdrawal Percentage	Number	0–100%; appears if Cashflows=Withdraw %	Cashflows	—

Rebalancing	Dropdown	No rebalancing, Annually, Semiannually, Quarterly, Monthly, Rebalance bands	—	Rebalance annually
Rebalancing Bands	Number	Absolute/Relative deviation; appears if Rebalancing=Bands	Rebalancing	—
Leverage Type	Dropdown	None, Fixed Debt Amount, Fixed Leverage Ratio	—	None
Leverage Amount/Ratio	Number	>0; appears if Leverage selected	Leverage Type	—
Reinvest Dividends	Dropdown	Yes/No	—	Yes
Display Income	Dropdown	Yes/No	—	Yes
Style Analysis	Dropdown	Yes/No	—	No
Factor Regression	Dropdown	Yes/No	—	No
Portfolio Names	Dropdown	Default/Custom	—	Default
Benchmark	Dropdown	None, Specify Ticker, Import Benchmark	—	Specify Ticker

Benchmark Ticker	Text	Valid ticker symbol; required if Benchmark=Specify Ticker	Benchmark	VFINX
Portfolio Assets	Text + Number	Ticker symbols + allocation % (must sum to 100)	—	VTSMX(40%), VGTSX(20%), etc

4. FUND FACTOR REGRESSION

Tool/Page: Mutual Fund and ETF Factor Regressions

URL: https://www.portfoliovisualizer.com/etf-and-mutual-fund-factor-regression

Field (UI Label)	Type	Observed Constraints / Notes	Dependent on	Default
Equity Factor Returns	Dropdown	Fama-French/AQR/ Alpha Architect	-	Fama-French Research Factors
Stock Market	Dropdown	US/Intl Developed markets	-	United States

Equity Factor Model	Dropdown	None/3-Factor/4-Factor/5-Factor/6-Factor	-	Three-Factor Model
Fixed Income Factor Model	Dropdown	None/Term+Credit/Advanced	Stock Market=US	None
Fund Type	Dropdown	All/ETF/Mutual Fund/Closed-End	-	All
Fund Category	Dropdown	All/US Equity/Intl Equity/Fixed Income/Alternatives	-	US Equity Funds
Time Period	Dropdown	24-60 months or Maximum	-	36 Months
R^2 Threshold	Dropdown	70% to 95% minimum	-	>= 80%

Statistical Significance	Checkboxes	MKT-RF, SMB, HML, MOM, RMW, CMA, QMJ, BAB, TRM, etc.	Factor Model	MKT-RF, SMB, HML

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5. ASSET CORRELATION FORM

Tool/Page: ASSET CORRELATION FORM

URL:https://www.portfoliovisualizer.com/asset-correlations

Field (UI Label)	Type	Observed Constraints / Notes	Dependent on	Default
Tickers	Text (multi-value, comma/whitespace separated)	Required; accepts multiple ticker symbols; auto-uppercase; has dropdown options for lazy portfolios and saved lists	—	VTI VNQ GLD BND
Start Date	Text (date, MM/DD/YYYY)	Optional; format MM/DD/YYYY; maxlength=10; if blank, uses earliest available date	—	(empty)

End Date	Text (date, MM/DD/YYYY)	Optional; format MM/DD/YYYY; maxlength=10; if blank, uses most recent available date; should be ≥ Start Date	Start Date	(empty)
Correlation Basis	Dropdown (single select)	Sampling period for correlation calculations. Options: Daily Returns, Monthly Returns, Annual Returns. Controls visibility of rolling correlation field.	—	Monthly Returns
Rolling Correlation (Trading Days)	Dropdown (single select)	Number of trading days for rolling correlation; visible only when Correlation Basis = Daily Returns; Options: 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	Correlation Basis = Daily	60 Trading Days
Rolling Correlation (Months)	Dropdown (single select)	Number of months for rolling correlation; visible only when Correlation Basis = Monthly Returns; Options: 12, 24, 36, 48, 60; hidden by default (display: none)	Correlation Basis = Monthly	36 Months

6. FUND SCREENER FORM

Tool/Page: FUND SCREENER FORM

URL:https://www.portfoliovisualizer.com/fund-screener

Field (UI Label)	Type	Observed Constraints / Notes	Dependent on	Default
Fund Type	Dropdown (single select)	Options: All, ETF, Mutual Fund, Closed-End Fund	—	All
Asset Class	Dropdown (single select)	Options: All, U.S. Equity, International Equity, Taxable Bond, Municipal Bond, Sector Equity, Allocation, Alternative, Commodities, Miscellaneous, Nontraditional Equity; triggersupdateCategories()	—	All
Fund Category	Multi-select (list)	Dynamically populated based on Asset Class selection; hidden by default (display: none)	Asset Class	—
Benchmark	Dropdown (single select)	Options: All, or 52 specific benchmark indices (Bloomberg, MSCI, S&P, Russell, etc.)	—	All

Performance History	Dropdown (single select)	Options: All, 3+ years, 5+ years, 10+ years, 15+ years, 20+ years, 25+ years	—	All
Expense Ratio	Dropdown (single select)	Options: All, < 0.25%, < 0.50%, < 0.75%, < 1.00%	—	All

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7. MANAGER PERFORMANCE ANALYSIS FORM

Tool/Page: MANAGER PERFORMANCE ANALYSIS FORM

URL:https://www.portfoliovisualizer.com/manager-performance

Field (UI Label)	**Type**	**Observed Constraints / Notes**	**Dependent on**	**Default**
Ticker	Text	Valid/required manager name or id	—	FLPSX
Benchmark	Text	Valid/optional benchmark ticker/name	—	VOE
Risk Factor Model	Dropdown	None / SRL / Fama-French US / Fama-French Intl	—	Fama-French US

Regression Method	Dropdown	LASSO + OLS (single option)	RISK FACTOR MODEL	LASSO + OLS
Regime Performance	Dropdown	Yes/No	—	Yes
Regime Type	Dropdown	Market Volatility (single option)	Regime Performance =Yes	Market Volatility
Regime Analysis	Dropdown	In Aggregate / By Period	Regime Performance =Yes	In Aggregate
Start Date	Text	Optional date, MM/DD/YYYY format	—	01/01/2015
End Date	Text	Optional date, MM/DD/YYYY format	—	(empty)
Periodicity	Dropdown	Monthly / Quarterly	—	Monthly
Rolling Period	Dropdown	3-60 Months, increments by 3	—	36 Months

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8. **PORTFOLIO OPTIMIZATION FORM**

Tool/Page: PORTFOLIO OPTIMIZATION FORM

URL:https://www.portfoliovisualizer.com/optimize-portfolio

Field	Type	Constraints	Dependent On	Default
Portfolio Type	Dropdown	Asset Classes/Tickers	-	Tickers
Time Period	Dropdown	Month/Year	-	Year-to-Year
Start Year	Dropdown	1985-2025	-	1985
End Year	Dropdown	1985-2025	-	2025
Optimization Goal	Dropdown	15 options	-	Maximize Sharpe Ratio
Robust Optimization	Dropdown	Yes/No	-	No
Use Historical Returns	Dropdown	Yes/No	-	Yes
Use Historical Volatility	Dropdown	Yes/No	Historical Returns = No	Yes

Use Historical Correlations	Dropdown	Yes/No	Historical Returns = No	Yes
Asset Constraints	Dropdown	Yes/No	-	Yes
Group Constraints	Dropdown	Yes/No	-	No
Compared Allocation	Dropdown	4 options	-	None
Benchmark	Dropdown	None/Ticker/Import	-	None
Asset Symbols	Text	Valid tickers	-	-
Allocations	Number	0-100%	-	-
Min/Max Weights	Number	0-100%	Asset Constraints = Yes	-
Expected Returns	Number	Percentage	Historical Returns = No	-

Volatilities	Number	Percentage	Historical Volatility = No	-

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9. MONTE CARLO SIMULATION

Tool/Page: MONTE CARLO SIMULATION

URL:https://www.portfoliovisualizer.com/monte-carlo-simulation

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value
Portfolio Type	Dropdown	Asset Classes, Tickers	None	Tickers
Initial Amount	Numeric	Positive integer, $1-10M	None	1000000
Cashflows	Dropdown	8 options	None	Withdraw fixed amt
Cashflows Amounts	File	CSV, Excel files	Cashflows =Import	(hidden)
Withdrawal Amount	Numeric	Positive integer	Cashflows =Withdraw fixed amt	45000

Inflation Adjusted	Dropdown	Yes/No	Cashflows	Yes
Withdrawal Percentage	Numeric	0.1-100%	Cashflows =Withdraw percentage	4.0
Rolling Average Periods	Dropdown	2,3,4,5	Cashflows =Rolling average	3
Smoothing Rate	Dropdown	50-90%	Cashflows =Geometric spending	75%
Withdrawal Frequency	Dropdown	Monthly, Quarterly, Annually	Cashflows	Annually
Life Expectancy Model	Dropdown	Single, Uniform	Cashflows =Life expectancy	Single Life
Current Age	Dropdown	30-95	Cashflows =Life expectancy	70
Simulation Period in Years	Dropdown	5-75 years	None	30
Tax Treatment	Dropdown	Pre-tax, After-tax	None	Pre-tax

Investment Horizon	Dropdown	Simulated, Perpetual	Tax Treatment= After-tax	Simulated Period
Federal Income Tax	Numeric	0-100%	Tax Treatment= After-tax	37.0
Capital Gains Tax	Numeric	0-100%	Tax Treatment= After-tax	20.0
Dividend Tax	Numeric	0-100%	Tax Treatment= After-tax	20.0
Affordable Care Act Tax	Numeric	0-100%	Tax Treatment= After-tax	3.8
State Income Tax	Numeric	0-100%	Tax Treatment= After-tax	0.0
Simulation Model	Dropdown	4 models	None	Historical Returns
Time Series Model	Dropdown	Normal, GARCH	Simulation Model	Normal Returns

Risk-Free Rate	Numeric	0.1-50%	Simulation Model	3.9
Use Historical Volatility	Dropdown	Yes/No	Simulation Model	Yes
Use Historical Correlations	Dropdown	Yes/No	Simulation Model	Yes
Correlation Matrix	File	CSV, Excel files	Use Historical Correlations=No	(hidden)
Use Full History	Dropdown	Yes/No	Simulation Model=Historical	Yes
Start Year	Dropdown	1972-2024	Use Full History=No	1972
End Year	Dropdown	1972-2024	Use Full History=No	2024
Bootstrap Model	Dropdown	Single Month, Single Year, Block	Simulation Model=Historical	Single Year

Block Min. Years	Numeric	Positive integer	Bootstrap Model=Block	1
Block Max. Years	Numeric	Positive integer	Bootstrap Model=Block	20
Circular Bootstrapping	Dropdown	Yes/No	Bootstrap Model=Block	Yes
Distribution	Dropdown	Normal, Fat-Tailed	Simulation Model	Normal Distribution
Degrees of Freedom	Numeric	5-50	Distribution =Fat-Tailed	30
Expected Return	Numeric	0.1-50%	Simulation Model=Parameterized	7.0
Volatility	Numeric	0.1-100%	Simulation Model=Parameterized	12.0
Sequence of Returns Risk	Dropdown	0-10 worst years	None	No Adjustments

Inflation Model	Dropdown	Historical, Parameterized	None	Historical Inflation
Inflation Mean	Numeric	0-100%	Inflation Model=Parameterized	4.0
Inflation Volatility	Numeric	0-100%	Inflation Model=Parameterized	3.0
Rebalancing	Dropdown	None, Monthly, Quarterly, Semi, Annual	None	Rebalance annually
Intervals	Dropdown	Defaults, Custom	None	Defaults
Percentile Intervals	Text	Comma-separated numbers	Intervals=Custom	10,25,50,75,90
Return Intervals	Text	Comma-separated numbers	Intervals=Custom	0,2.5,5,7.5,10,12.5
Fee Structure	Dropdown	None, Add fee structure	None	None
Asset Ticker	Text	Stock ticker format	Portfolio Type=Tickers	(empty)

Asset Allocation	Numeric	0-100%	Asset selected	(empty)

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10. TEST TACTICAL ALLOCATION MODELS

Tool/Page: TEST TACTICAL ALLOCATION MODELS

URL:https://www.portfoliovisualizer.com/tactical-asset-allocation-model

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value
Tactical Model	Select dropdown	8 options: Shiller PE Ratio, Seasonal Model, Moving Averages for Asset (default), Moving Averages for Portfolio, Relative Strength, Dual Momentum, Adaptive Allocation, Target Volatility	None	"Moving Averages for Asset" (value: 3)
Time Period	Select dropdown	2 options: Month-to-Month, Year-to-Year (default)	None	"Year-to-Year" (value: 4)
Start Year	Select dropdown	Years 1972-2025	None	1985

First Month	Select dropdown	Months Jan-Dec	Time Period = "Month-to-Month"	January (value: 1)
End Year	Select dropdown	Years 1972-2025	None	2025
Last Month	Select dropdown	Months Jan-Dec	Time Period = "Month-to-Month"	December (value: 12)
Calendar Aligned	Select dropdown	Yes/No	Time Period = "Month-to-Month"	Yes
Include YTD	Select dropdown	Yes/No	None	No
Portfolio Settings				
Initial Amount	Number input	Positive integer, includes ".00" suffix	None	10000
Cashflows	Select dropdown	4 options: None (default), Contribute fixed amount, Withdraw fixed amount, Withdraw fixed percentage	None	"None" (value: 0)

Contribution Amount	Number input	Positive integer, appears when Cashflows ≠ "None"	Cashflows = "Contribute fixed amount" or "Withdraw fixed amount"	0
Inflation Adjusted	Select dropdown	Yes/No	Cashflows ≠ "None"	Yes
Withdrawal Percentage	Number input	Percentage value	Cashflows = "Withdraw fixed percentage"	0.0%
Withdrawal Frequency	Select dropdown	Monthly, Quarterly, Annually (default)	Cashflows ≠ "None"	Annually
Ticker	Text input	Stock, mutual fund or ETF ticker	None	Empty
Tickers	Text input	Up to 50 tickers	Certain tactical models	Empty
Moving Average Settings				

Buy Signal	Select dropdown	3 options: Price >= Moving average (default), Moving average #1 >= Moving average #2, Moving average #2 >= Moving average #1	Timing Model = Moving Averages	"Price >= Moving average"
Type of Moving Average	Select dropdown	Simple Moving Average (default), Exponential Moving Average	Timing Model = Moving Averages	"Simple Moving Average"
Lookback Period	Select dropdown	1-36 months or "Specify..." option	Timing Model = Moving Averages	3 months
Lookback period in trading days	Number input	Positive integer	Lookback Period = "Specify..."	63
Type of Moving Average #2	Select dropdown	Simple Moving Average (default), Exponential Moving Average	Buy Signal uses two moving averages	"Simple Moving Average"
Lookback Period #2	Select dropdown	1-36 months or "Specify..." option	Buy Signal uses two moving averages	12 months

Lookback period #2 in trading days	Number input	Positive integer	Lookback Period #2 = "Specify..."	252
Performance Periods	Select dropdown	Single Period (default), Multiple Periods	Certain tactical models	"Single Period"
Period Weighting	Select dropdown	Weight rank orders, Weight performance (default)	Performance Periods = "Multiple Periods"	"Weight performance"
Exclude Previous Month	Select dropdown	No (default), Yes	Certain tactical models	No
Normalize Returns	Select dropdown	No (default), Yes	Certain tactical models	No
Volatility Period	Select dropdown	None (default), Specify..., 2-12 months	Certain tactical models	"None"
Volatility window in trading days	Number input	Positive integer	Volatility Period = "Specify..."	0
Assets to hold	Select dropdown	1-12 assets	Multi-asset models	1

Allocation Weights	Select dropdown	8 weighting methods	Multi-asset models	"Risk Parity"
Risk Management Strategy	Select dropdown	4 options	Certain tactical models	"Crossover Signal"
Risk Control	Select dropdown	3 options	Certain tactical models	"No Moving Average"
Risk Window Period	Select dropdown	1-36 months or "Specify..."	Risk Control ≠ "No Moving Average"	10 months
Risk window in trading days	Number input	Positive integer	Risk Window Period = "Specify..."	0
Specify signal asset	Text input	Ticker symbol	Risk Control = specific option	Empty
Stop Loss	Select dropdown	3 options: No stop-loss (default), Stop-loss at each asset, Stop-loss at portfolio level	None	"No stop-loss"
Stop Loss Threshold	Number input	Percentage value	Stop Loss ≠ "No stop-loss"	2.0%

Stop Loss Asset	Select dropdown	Cash (default), Select asset...	Stop Loss ≠ "No stop-loss"	"Cash"
Specify stop-loss asset	Text input	Ticker symbol	Stop Loss Asset = "Select asset..."	Empty
Max Derisk Percentage	Number input	Percentage value	Advanced risk settings	100%
Derisk Increment	Number input	Percentage value	Advanced risk settings	25%
Rerisk Increment	Number input	Percentage value	Advanced risk settings	25%
Trading Frequency	Select dropdown	5 options: At Signal, Weekly, Monthly (default), Bimonthly, Quarterly	None	Monthly
Trading Rule	Textarea	Custom expression	Advanced settings	Empty
Signal Asset	Select dropdown	Same as investment (default), Select asset...	None	"Same as investment"

Specify signal asset	Text input	Ticker symbol	Signal Asset = "Select asset..."	Empty
Rebalancing	Select dropdown	5 options	Portfolio models	"Rebalance monthly"
Trade Execution	Select dropdown	2 options: Trade at end of month price (default), Trade at next close price	None	"Trade at end of month price"
Leverage Type	Select dropdown	3 options: None (default), Fixed Debt Amount, Fixed Leverage Ratio	None	"None"
Leverage Ratio	Number input	Percentage value	Leverage Type = "Fixed Leverage Ratio"	0.0%
Debt Amount	Number input	Positive integer	Leverage Type = "Fixed Debt Amount"	0
Debt Interest	Number input	Percentage value	Leverage Type ≠ "None"	0.0%
Maintenance Margin	Number input	Percentage value	Leverage Type ≠ "None"	25.0%

Leveraged Benchmark	Select dropdown	Yes/No	Leverage Type ≠ "None"	No
Compared Allocation	Select dropdown	None, Default (default)	None	"Default"
Benchmark	Select dropdown	None (default), Specify Ticker..., Import Benchmark..., Vanguard options	None	"None"
Benchmark Ticker	Text input	Ticker symbol	Benchmark = "Specify Ticker..."	Empty
Show Regime Performance	Select dropdown	None (default), Add Market Regime..., Default Regimes	None	"None"
Fee Structure	Select dropdown	None (default), Add fee structure...	None	"None"
coreSatellite	Hidden input	Fixed value	None	"false"
aws	Hidden input	Fixed value	None	"true"

CONFIG FORMS

1. ASSET BACKFILLS CONFIGURATION

Tool/Page: ASSET BACKFILLS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-backfills

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value
Backfill Oldest Share Class	Dropdown	Yes/No	None	No
Asset Ticker 1-10	Dropdown	Select from available tickers	None	Select asset ticker
Backfill Ticker 1-10	Dropdown	Select from available tickers for each	None	Select asset ticker

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2. MANAGE REPORTS CONFIGURATION

Tool/Page: MANAGE REPORTS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-reports

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value

Company Name	Text	Max 64 characters	None	"Portfolio Visualizer"
Include Logo	Select	Yes/No	None	"Yes"
Logo Image	File	PNG, GIF, JPEG	Include Logo = "Yes"	Default logo
Page Footer Text	Text	Free text	None	"www.portfoliovisualizer.com"
Page Footer Link	Text	URL format	None	"https://www.portfoliovisualizer.com"
Use Cover Page	Select	Yes/No	None	"No"
Cover Page PDF	File	PDF files	Use Cover Page = "Yes"	No cover page
Include Page Numbers	Select	Yes/No	None	"Yes"
Include Report Date	Select	Yes/No	None	"Yes"
Custom Disclosures	Select	3 options: Replace, Above, Below	None	"Replace default"
Disclosures	Textarea	Free text	None	Empty
Report Font	Select	6 font options	None	"Roboto"
Chart Colors	Select	4 palettes + Custom	None	"Palette 1"

Color List	Text	Hex codes, space/comma separated	Chart Colors = "Custom"	Empty
Color Pickers (7 fields)	Color	Hex color code	None	Various defaults

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3. MANAGE FEES CONFIGURATION

Tool/Page: MANAGE FEES CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-fees

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value
Name	Text input	Free text, name of fee structure	None	Empty
Type	Select	5 fee types: Fixed Amount, Fixed Percentage (default), Tiered Percentage, Tiered Amount, Performance Based	None	"Fixed Percentage" (2)
Successive Tiers	Select	Yes/No	Type = Tiered Percentage/Amount	"No"

Annual Percentage of Assets	Number	% format, visible for % types	Type = Fixed/Tiered Percentage	1.0%
Annual Minimum	Number	Dollar amount, visible for amount types	Type = Fixed/Tiered Amount	1500
Inflation Adjusted	Select	Yes/No	Type = Fixed Amount	"No"
Annual Increase	Number	% format	Type = Fixed Amount	0.0%
Incentive Fee	Number	% format	Type = Performance Based	20.0%
Use Hurdle Rate	Select	Yes/No	Type = Performance Based	"No"
Fixed Hurdle Rate	Select	Yes/No	Use Hurdle Rate = "Yes"	"Yes"
Hurdle Rate	Number	% format	Use Hurdle Rate = "Yes"	5.0%
Hurdle Benchmark	Text input	Ticker symbol	Fixed Hurdle Rate = "No"	Empty

Hurdle Type	Select	Soft/Hard Hurdle	Use Hurdle Rate = "Yes"	"Soft Hurdle"
Use High-water Mark	Select	Yes/No	Type = Performance Based	"No"
Payment Schedule	Select	Monthly, Quarterly, Annually (default)	None	"Annually" (4)
Tier Assets (1-10)	Number	Dollar amount	Type = Tiered Percentage/Amount	Varies by tier
Tier Percentage (1-10)	Number	Percent format	Type = Tiered Percentage	Varies by tier
Tier Amount (1-10)	Number	Dollar amount	Type = Tiered Amount	Varies by tier

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4. MARKET EXPECTATIONS CONFIGURATION

Tool/Page: MARKET EXPECTATIONS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-market-expectations

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value
Type (1-10)	Select	Asset Class (default) / Ticker	None	"Asset Class" (1)
Asset Class (1-10)	Select	30+ asset classes in 4 categories	Type = "Asset Class"	"Select..." (empty)
Ticker (1-10)	Text/typeahead	Ticker symbol format	Type = "Ticker"	Empty
Return (1-10)	Number	Percentage format, can be negative	Asset/Ticker selected	Empty
Volatility (1-10)	Number	Positive percentage format	Asset/Ticker selected	Empty

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5. MARKET REGIMES CONFIGURATION

Tool/Page: MARKET REGIMES CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-market-regimes

Field (UI Label)	Type	Observed Constraints/Notes	Dependent on	Default Value
Name	Text input	Max 128 chars, required	None	Empty
Description	Text input	Optional description	None	Empty
Regime Data Source	Select	Existing Series / Imported File	None	Existing Series (true)
Time Series	Typeahead text	Ticker symbol	Data Source = Existing Series	Empty
Series Type	Select	Monthly Labels (disabled), Index, Returns	Data Source = Existing Series	"Monthly Labels" (disabled)
Regime Data File	File input	CSV, Excel formats	Data Source = Imported File	Empty
Regime Definitions	Select	6 definition types	None	"Value Breakdown" (200)

Smoothing Factor	Select	0-12 months	None	"None" (0)
Default Regime Type	Text input	Label for default regime	None	Empty
Regime Levels (1-4)	Select+Num+Text	Threshold configuration	Defs = "Value Breakdown"	Empty/Select
Dislocation Period	Select	1-12 months	Defs = "Dislocation"	6 months (6)
Dislocation Direction	Select	Up/Down	Defs = "Dislocation"	Down (2)
Regime Sort Order	Select	Chronological / Alpha / Numeric	None	Chronological (0)

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3. Define Equivalence Classes (ECP)

For each chosen form, identify the user-controllable fields and define valid and invalid equivalence classes.

1. **SIGNUP FORM**

   Tool/Page: Sign-Up
   URL: https://www.portfoliovisualizer.com/sign-up

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Profile Type	PT-V1	Valid selection from dropdown (e.g. Financial Advisor, Individual Investor, etc.)	Valid	Financial Advisor	Expected user category; system should accept submission
	PT-I1	Blank or not selected	Invalid	—	System should prompt user to select a valid profile type
Country	C-V1	Valid country selected from list	Valid	Pakistan	Dropdown option present; accepted
	C-I1	No selection / empty	Invalid	—	Required field; should trigger validation error
Market Region	MR-V1	Valid region selected from dropdown	Valid	North America	Expected configuration
	MR-I1	Empty or invalid selection	Invalid	—	Should prompt “Please select a region”

First Name	FN-V1	Alphabetic string with valid length	Valid	Uzair	Normal user name
	FN-I1	Empty / blank	Invalid	—	Required field
	FN-I2	Contains numeric/special characters	Invalid	Uzair123, @li	Should reject invalid names
Last Name	LN-V1	Alphabetic string	Valid	Majeed	Normal user input
	LN-I1	Blank	Invalid	—	Required field
	LN-I2	Contains digits/special chars	Invalid	Majeed@	Should be rejected
Business Email	EM-V1	Correct email format	Valid	uzair@example.com	Matches pattern *@*.*
	EM-I1	Missing “@” or domain	Invalid	uzairgmail.com	Should show invalid email error
	EM-I2	Already registered email	Invalid	existinguser@gmail.com	Should prompt “email already exists”
Company	CO-V1	Any text (optional)	Valid	Fast University	Field not mandatory

Firm Type	FT-V1	Valid firm type selected	Valid	Asset Manager	Required only for business profiles
Create Password	PW-V1	Valid password (meets all rules)	Valid	Abc12345	Typical minimum 8 chars
	PW-I1	Too short (<8 chars)	Invalid	12345	Should show “Password too short”
	PW-I2	Empty	Invalid	—	Required field
Verify Password	VP-V1	Matches create password	Valid	Abc12345	Should pass validation
	VP-I1	Does not match password	Invalid	Abc123 vs Abc12345	Should show “Passwords do not match”
	VP-I2	Empty	Invalid	—	Required field
reCAPTCHA	RC-V1	Successfully verified	Valid	Checked	Must verify human user
	RC-I1	Not verified / unchecked	Invalid	Unchecked	Should block submission

Valid Classes (V): 10

Invalid Classes (I): 13

Total Classes: 23

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2. LOGIN FORM

Tool/Page: Login

URL: https://www.portfoliovisualizer.com/login

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Email	EM-V1	Properly formatted, registered email	Valid	uzairmjd886@gmail.com	Expected successful login
	EM-I1	Empty email field	Invalid	"" (blank)	Email required; cannot submit empty
	EM-I2	Incorrect format (missing "@")	Invalid	uzair.gmail.com	UI/server should reject malformed email
	EM-I3	Unregistered but valid format email	Invalid	unknownuser@example.com	Format valid but account not found

	EM-I4	Too long (>255 chars)	Invalid	`uzair.longemailboundarychecktesting...@example.com` (256 chars)	Exceeds RFC/field limit
Password	PW-V1	Correct password (matches account)	Valid	P@ssword123	Successful authentication
	PW-I1	Empty password	Invalid	""	Required field
	PW-I2	Incorrect password (wrong value)	Invalid	WrongPass123	Rejected credentials
	PW-I3	Too short (<8 chars)	Invalid	12345	Fails min-length rule
Stay signed in	ST-V1	Checked	Valid	checked	Optional persistence enabled
	ST-V2	Unchecked	Valid	unchecked	Optional persistence disabled

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3. BACKTEST PORTFOLIO FORM

Tool/Page: Backtest Portfolio

URL: https://www.portfoliovisualizer.com/backtest-portfolio

Field	Class ID	Class Description	Valid/Invalid	Representative Values	Rationale
Time Period	TP-V1	Year-to-Year	Valid	Year-to-Year	Default/yearly
	TP-V2	Month-to-Month	Valid	Month-to-Month	Monthly selection
Start Year	SY-V1	1985–2025 and ≤ End Year	Valid	2000	Normal range
	SY-I1	<1985, >2025, or > End Year	Invalid	1980, 2026, >End Year	Out of core range/logic
End Year	EY-V1	1985–2025 and ≥ Start Year	Valid	2015	Normal range
	EY-I1	<1985, >2025, or < Start Year	Invalid	1984, 2030, <Start Year	Out of core range/logic
Include YTD	YTD-V1	Yes	Valid	Yes	Covers most recent data
	YTD-V2	No	Valid	No	Excludes unclosed period
Initial Amount	IA-V1	Positive integer (>0)	Valid	10000	Usual case
	IA-I1	0 or negative or non-numeric	Invalid	0, -1000, "abc"	Invalid value
Cashflows	CF-V1	None	Valid	None	No cashflows
	CF-V2	Contribute fixed	Valid	Contribute 1000	User adds money
	CF-V3	Withdraw fixed amount	Valid	Withdraw 500	User removes money

	CF-V4	Withdraw fixed %	Valid	Withdraw 4%	Withdraw by percent
Contribution Amt	CA-V1	>0 (when triggered)	Valid	1000	Valid contribution
	CA-I1	0 or negative (when triggered)	Invalid	0, -500	Invalid value
Withdrawal Amount	WA-V1	>0	Valid	500	Valid withdrawal
	WA-I1	0 or negative	Invalid	0, -100	Invalid value
Withdrawal %	WP-V1	0–100%	Valid	4, 100	Within allowed range
	WP-I1	<0 or >100%	Invalid	-1, 150	Invalid percent
Rebalancing	RB-V1	No rebalancing	Valid	None	Buy-and-hold
	RB-V2	Annual/Quarterly/Monthly	Valid	Annual	Common choices
	RB-V3	Bands	Valid	Bands	Threshold-based
Bands Amt	BA-V1	Valid threshold (>0)	Valid	5	Typical band
	BA-I1	0 or negative (invalid trigger)	Invalid	0, -2	Invalid value
Leverage Type	LT-V1	None	Valid	None	Usual case
	LT-V2	Fixed Debt	Valid	Fixed Debt Amount	Use of debt
	LT-V3	Fixed Ratio	Valid	Fixed Ratio	Leverage by ratio

Leverage Amt/Ratio	LA-V1	>0	Valid	1.5	Valid setting
	LA-I1	0 or negative	Invalid	0, -1	Invalid value
Reinvest Dividends	RD-V1	Yes	Valid	Yes	
	RD-V2	No	Valid	No	
Asset Allocations	AA-V1	Each 0–100, sum=100	Valid	60/40	Standard allocation
	AA-I1	<0, >100, or sum≠100	Invalid	-10/110 or 30/30/30 (sum≠100)	Error for misallocation
Benchmark	BM-V1	Predefined ticker	Valid	VFINX	
	BM-I1	Empty/invalid if required	Invalid	""/XYYZ	
Portfolio Names	PN-V1	Default	Valid	Default	
	PN-V2	Custom	Valid	"Aggressive"	

- **Valid Classes: 29**
- **Invalid Classes: 12**
- **Total Classes: 41**

4. FUND FACTOR REGRESSION

Tool/Page: Mutual Fund and ETF Factor Regressions

URL: https://www.portfoliovisualizer.com/etf-and-mutual-fund-factor-regression

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Equity Factor Returns	EF-V1	Fama-French	Valid	Fama-French Research Factors	Standard academic factor model
	EF-V2	AQR Factors	Valid	AQR Factors	Alternative factor methodology
	EF-V3	Alpha Architect	Valid	Alpha Architect Factors	Specialized factor approach
Stock Market	SM-V1	US Market	Valid	United States	Domestic market analysis
	SM-V2	International Ex-US	Valid	Intl Developed Ex US	International markets excluding US
	SM-V3	International Developed	Valid	Intl Developed	All developed markets including US
Equity Factor Model	EM-V1	None	Valid	None	No equity factor analysis
	EM-V2	3-Factor Model	Valid	Three-Factor Model	Basic market, size, value factors

	EM-V3	4-Factor Model	Valid	Four-Factor Model	Adds momentum factor
	EM-V4	5-Factor Model	Valid	Five-Factor Model	Adds profitability, investment factors
	EM-V5	6-Factor Model	Valid	Six-Factor Model	Most comprehensive factor set
Fixed Income Factor Model	FI-V1	None	Valid	None	No fixed income factor analysis
	FI-V2	Term + Credit	Valid	Term + Credit	Basic bond risk factors
	FI-V3	Advanced (2x Term + 2x Credit)	Valid	2 x Term + 2 x Credit	Detailed term structure analysis
Fund Type	FT-V1	All funds	Valid	All	Include all fund types
	FT-V2	ETFs only	Valid	ETF	Exchange-traded funds only
	FT-V3	Mutual Funds only	Valid	Mutual Fund	Traditional mutual funds only
	FT-V4	Closed-End Funds	Valid	Closed-End Fund	Closed-end investment companies

Fund Category	FC-V1	All categories	Valid	All	Include all investment categories
	FC-V2	US Equity	Valid	US Equity Funds	Domestic stock funds
	FC-V3	International Equity	Valid	Intl Equity Funds	Foreign stock funds
	FC-V4	Fixed Income	Valid	Fixed Income	Bond and income funds
	FC-V5	Alternatives	Valid	Alternatives	Alternative strategy funds
Time Period	TP-V1	24 months	Valid	24 Months	Short-term analysis (2 years)
	TP-V2	36 months	Valid	36 Months	Medium-term analysis (3 years)
	TP-V3	48 months	Valid	48 Months	Medium-term analysis (4 years)
	TP-V4	60 months	Valid	60 Months	Long-term analysis (5 years)
	TP-V5	Maximum available	Valid	Maximum	Full available data history

R^2 Threshold	RS-V1	70% minimum	Valid	>= 70%	Low goodness-of-fit filter
	RS-V2	80% minimum	Valid	>= 80%	Medium goodness-of-fit filter
	RS-V3	90% minimum	Valid	>= 90%	High goodness-of-fit filter
	RS-V4	95% minimum	Valid	>= 95%	Very high goodness-of-fit filter
Statistical Significance	SS-V1	No factors selected	Valid	(none checked)	Show all results regardless of significance
	SS-V2	Some factors selected	Valid	MKT-RF, SMB	Filter for specific significant factors
	SS-V3	All available factors	Valid	All checkboxes	Filter for comprehensive significance

Valid Classes (V): 29

Invalid Classes (I): 0 (All fields have valid default selections)

Total Classes: 29

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5. ASSET CORRELATION FORM

Tool/Page: ASSET CORRELATION FORM

URL:https://www.portfoliovisualizer.com/asset-correlations

Field	Class ID	Class Description	Valid/Invalid	Representative Values	Rationale
Tickers	TK-V1	Single valid ticker	Valid	VTI	Minimum valid input (1 ticker)
	TK-V2	Multiple valid tickers (2-10)	Valid	VTI VNQ GLD BND	Typical use case
	TK-V3	Many valid tickers (>10)	Valid	VTI VNQ GLD BND VXUS VWO VEA VTV VBR VIG VTEB VYM	Stress test with many assets
	TK-V4	Valid tickers with comma separator	Valid	VTI,VNQ,GLD,BND	Alternative separator
	TK-V5	Mixed case tickers (auto-uppercase)	Valid	vti vnq gld	Should auto-convert to uppercase
	TK-I1	Empty tickers field	Invalid	(blank)	Required field

	TK-I2	Invalid/non-existent ticker	Invalid	INVALID123	Unknown symbol
	TK-I3	Mixed valid and invalid tickers	Invalid	VTI INVALID GLD	Partial failure
	TK-I4	Special characters only	Invalid	@#$%	Invalid format
Start Date	SD-V1	Empty (optional, uses earliest)	Valid	(blank)	Default behavior
	SD-V2	Valid date within data range	Valid	01/01/2010	Normal date input
	SD-V3	Valid recent date	Valid	01/01/2020	Recent data
	SD-I1	Invalid format (not MM/DD/YYYY)	Invalid	2020-01-01, 01/2020	Wrong format
	SD-I2	Invalid date (non-existent)	Invalid	02/30/2020, 13/01/2020	Invalid calendar date
	SD-I3	Future date	Invalid	01/01/2030	Beyond available data

	SD-I4	Date before data availability	Invalid	01/01/1900	Too early
	SD-I5	Exceeds maxlength (>10 chars)	Invalid	01/01/20200 (11 chars)	Length violation
End Date	ED-V1	Empty (optional, uses latest)	Valid	(blank)	Default behavior
	ED-V2	Valid date ≥ Start Date	Valid	12/31/2020	Normal end date
	ED-V3	Equal to Start Date (single day)	Valid	01/01/2020 (same as start)	Boundary: minimum period
	ED-I1	Invalid format	Invalid	2020-12-31	Wrong format
	ED-I2	Invalid date (non-existent)	Invalid	02/31/2020	Invalid calendar date
	ED-I3	End Date < Start Date	Invalid	Start: 01/01/2020, End: 01/01/2019	Inverted range
	ED-I4	Future date	Invalid	01/01/2030	Beyond available data

	ED-I5	Exceeds maxlength	Invalid	12/31/20200 (11 chars)	Length violation
Correlation Basis	CB-V1	Daily Returns	Valid	Daily Returns (value=1)	High-frequency sampling
	CB-V2	Monthly Returns	Valid	Monthly Returns (value=2)	Default; medium-frequency
	CB-V3	Annual Returns	Valid	Annual Returns (value=4)	Low-frequency sampling
Rolling Correlation (Trading Days)	RT-V1	20 trading days	Valid	20 Trading Days	Minimum (LB)
	RT-V2	60 trading days	Valid	60 Trading Days	Default
	RT-V3	120 trading days	Valid	120 Trading Days	Maximum (UB)
	RT-V4	Mid-range values	Valid	50, 80, 100	Nominal values
Rolling Correlation (Months)	RM-V1	12 months	Valid	12 Months	Minimum (LB)

	RM-V2	36 months	Valid	36 Months	Default
	RM-V3	60 months	Valid	60 Months	Maximum (UB)
	RM-V4	Mid-range values	Valid	24, 48	Nominal values

- **Valid Classes (V): 23**
- **Invalid Classes (I): 15**
- **Total Classes: 38**

6. FUND SCREENER FORM

Tool/Page: FUND SCREENER FORM

URL:https://www.portfoliovisualizer.com/fund-screener

Field	**Class ID**	**Class Description**	**Valid/Invalid**	**Representative Values**	**Rationale**
Fund Type	FT-V1	All funds	Valid	All (value=-1)	Default; no filter applied
	FT-V2	ETF only	Valid	ETF (value=2)	Specific fund type filter
	FT-V3	Mutual Fund only	Valid	Mutual Fund (value=5)	Specific fund type filter

	FT-V4	Closed-End Fund only	Valid	Closed-End Fund (value=4)	Specific fund type filter
Asset Class	AC-V1	All asset classes	Valid	All (value="")	Default; no filter
	AC-V2	U.S. Equity	Valid	U.S. Equity	Major asset class
	AC-V3	International Equity	Valid	International Equity	Major asset class
	AC-V4	Taxable Bond	Valid	Taxable Bond	Fixed income class
	AC-V5	Municipal Bond	Valid	Municipal Bond	Tax-advantaged bonds
	AC-V6	Sector Equity	Valid	Sector Equity	Sector-specific funds
	AC-V7	Allocation	Valid	Allocation	Multi-asset allocation
	AC-V8	Alternative	Valid	Alternative	Alternative strategies
	AC-V9	Commodities	Valid	Commodities	Commodity exposure
	AC-V10	Miscellaneous	Valid	Miscellaneous	Other categories

	AC-V11	Nontraditional Equity	Valid	Nontraditional Equity	Non-standard equity
Fund Category	FC-V1	No selection (hidden field)	Valid	(none)	Dependent field not shown
	FC-V2	One or more categories selected	Valid	(depends on Asset Class)	Dynamic multi-select
Benchmark	BM-V1	All benchmarks	Valid	All (value="")	Default; no filter
	BM-V2	Specific benchmark (equity)	Valid	S&P 500 TR USD	U.S. equity benchmark
	BM-V3	Specific benchmark (fixed income)	Valid	Bloomberg US Agg Bond TR USD	Bond benchmark
	BM-V4	Specific benchmark (international)	Valid	MSCI ACWI Ex USA NR USD	International benchmark
	BM-V5	Specific benchmark (alternative)	Valid	Bloomberg Commodity TR USD	Commodity benchmark

Performance History	PH-V1	All (no minimum)	Valid	All (value=-1)	Default; no history filter
	PH-V2	3+ years	Valid	3 or more years (value=3)	Short history requirement (LB)
	PH-V3	5+ years	Valid	5 or more years (value=5)	Medium history
	PH-V4	10+ years	Valid	10 or more years (value=10)	Long history
	PH-V5	15+ years	Valid	15 or more years (value=15)	Very long history
	PH-V6	20+ years	Valid	20 or more years (value=20)	Extended history
	PH-V7	25+ years	Valid	25 or more years (value=25)	Maximum history (UB)
Expense Ratio	ER-V1	All (no limit)	Valid	All (value=-1)	Default; no expense filter
	ER-V2	< 0.25%	Valid	< 0.25% (value=0.25)	Very low cost (LB)

	ER-V3	< 0.50%	Valid	< 0.50% (value=0.5)	Low cost
	ER-V4	< 0.75%	Valid	< 0.75% (value=0.75)	Moderate cost
	ER-V5	< 1.00%	Valid	< 1.00% (value=1.0)	Higher cost threshold (UB)

- **Valid Classes (V): 35**
- **Invalid Classes (I): 0 *(All fields are dropdowns with predefined valid options only)***
- **Total Classes: 35**

7. MANAGER PERFORMANCE ANALYSIS FORM

Tool/Page: MANAGER PERFORMANCE ANALYSIS FORM

URL:https://www.portfoliovisualizer.com/manager-performance

Field	Class ID	Class Description	Valid/Invalid	Representative Values	Rationale
Ticker	TK-V1	Valid name/ticker	Valid	FLPSX	Normal use
	TK-I1	Invalid/empty ticker	Invalid	(blank), XYZ!@#	Should give error
Benchmark	BM-V1	Valid benchmark	Valid	VOE	Normal use
	BM-I1	Invalid/empty benchmark (optional)	Invalid	(blank), QQQBAD	UI should allow blank, error for bad id

Risk Factor Model	RM-V1	None	Valid	None	
	RM-V2	SRL Analytics	Valid	SRL Analytics	
	RM-V3	Fama-French US	Valid	Fama-French US Equity	Default
	RM-V4	Fama-French Intl	Valid	Fama-French Intl Developed	
Regression Method	RG-V1	LASSO + OLS	Valid	LASSO + OLS	Only option
Regime Performance	RP-V1	No	Valid	No	Triggers/hides dynamic fields
	RP-V2	Yes	Valid	Yes	Triggers regime fields
Regime Type	RT-V1	Market Volatility	Valid	Market Volatility	Only option
Regime Analysis	RA-V1	In Aggregate	Valid	In Aggregate	Default
	RA-V2	By Period	Valid	By Period	Alternate
Start Date	SD-V1	Valid date format	Valid	01/01/2015	MM/DD/YYYY
	SD-I1	Invalid date (format/value/future)	Invalid	15/99/2020, 01/99/3000	Error
End Date	ED-V1	Valid/empty date	Valid	(empty), 12/31/2021	Empty=latest
	ED-I1	Invalid date	Invalid	99/99/9999, 01/01/1980	Error

Periodicity	PC-V1	Monthly	Valid	Monthly	Default
	PC-V2	Quarterly	Valid	Quarterly	
Rolling Period	RP-V1	3, 36, 60	Valid	3, 36, 60	LB, Nominal, UB

- ***Total valid classes: 18***
- ***Total invalid classes: 4***
- ***Total : 20***

8. PORTFOLIO OPTIMIZATION FORM

Tool/Page: PORTFOLIO OPTIMIZATION FORM

URL:https://www.portfoliovisualizer.com/optimize-portfolio

Field	Class ID	Class Description	Valid/Invalid	Representative Value(s)	Rationale
Portfolio Type	PT-V1	Asset Classes	Valid	Asset Classes	Grouping assets
	PT-V2	Tickers	Valid	Tickers	Security-level
Time Period	TP-V1	Year-to-Year	Valid	Year-to-Year	Annual
	TP-V2	Month-to-Month	Valid	Month-to-Month	Monthly
Start Year	SY-V1	Valid year in range	Valid	2000	Typical value
	SY-I1	Start > End	Invalid	Start:2020, End:2010	Logic error
	SY-I2	<1985 or >2025	Invalid	1984, 2026	Range error

End Year	EY-V1	Valid year in range	Valid	2020	Typical value
	EY-I1	End < Start	Invalid	End:2010, Start:2020	Logic error
	EY-I2	<1985 or >2025	Invalid	1984, 2026	Range error
Optimization Goal	OG-V*	(13 options, e.g. Max Sharpe, Min Vol, etc.)	Valid	See list you gave	Test all drivers
Robust Optimization	RO-V1	No robust optimization	Valid	No	Default
	RO-V2	With robust optimization	Valid	Yes	Edge
Use Historical Returns	HR-V1	Use historical returns	Valid	Yes	Default
	HR-V2	Specify custom returns	Valid	No	Input required
Use Historical Volatility	HV-V1	Yes	Valid	Yes	Default
	HV-V2	No	Valid	No	Custom input
Use Historical Corr	HC-V1	Yes	Valid	Yes	Default
	HC-V2	No	Valid	No	Custom input (file)
Asset Constraints	AC-V1	Yes	Valid	Yes	Min/Max required
	AC-V2	No	Valid	No	None

Group Constraints	GC-V1	No group constraints	Valid	No	Default
	GC-V2	Group constraints	Valid	Yes	Groups present
Compared Alloc	CA-V*	None, EQ Weighted, Risk Parity, etc. (5 options)	Valid	Each	Benchmarks
Benchmark	BM-V*	None/Ticker/Import/Predefined (4 options)	Valid	Each	Test all
Asset Symbols	AS-V1	Valid ticker	Valid	VTSMX	Success
	AS-I1	Invalid ticker	Invalid	INVALID	Fail
	AS-I2	Empty symbol	Invalid	""	Fail
Allocations	AL-V1	Sum equals 100%	Valid	60%, 40%	Normal split
	AL-I1	Sum < 100%	Invalid	30%, 30%	Under-allocated
	AL-I2	Sum > 100%	Invalid	60%, 50%	Over-allocated
	AL-I3	Negative allocation	Invalid	-10%	Not allowed
Min/Max Weights	MW-V1	Valid (0-100%)	Valid	Min=0%, Max=100%	Typical
	MW-I1	Min > Max	Invalid	Min=50%, Max=40%	Fail
	MW-I2	Negative value	Invalid	Min=-5%	Fail
Expected Returns	ER-V1	Positive return	Valid	8.0%	Good
	ER-I1	Negative return	Invalid	-5.0%	Nonsense

	ER-I2	Extreme value	Invalid	200.0%	Out of range
Volatilities	VOL-V1	Positive	Valid	15.0%	Reasonable
	VOL-I1	Negative	Invalid	-10.0%	Not possible
	VOL-I2	Extreme	Invalid	500.0%	Out of range

- ***Valid Classes (V): 45***
- ***Invalid Classes (I): 15***
- ***Total Classes: 60***

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9. MONTE CARLO SIMULATION

Tool/Page: MONTE CARLO SIMULATION

URL:https://www.portfoliovisualizer.com/monte-carlo-simulation

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Portfolio Type	PT-V1	Asset Classes selection	Valid	Asset Classes	Asset-level optimization
	PT-V2	Tickers selection	Valid	Tickers	Security-level optimization

Initial Amount	IA-V1	Positive integer within range	Valid	1000000	Normal investment
	IA-I1	Zero/negative amount	Invalid	0, -1000	Positive required
	IA-I2	Above max ($10M+)	Invalid	10000001	Exceeds allowed
Cashflows	CF-V1	Valid dropdown option	Valid	Withdraw fixed	Standard workflow
Withdrawal Amount	WA-V1	Positive, in range	Valid	45000	Usual withdrawal
	WA-I1	Negative amount	Invalid	-5000	Logically invalid
	WA-I2	Zero withdrawal	Invalid	0	No withdrawal
Inflation Adjusted	IAJ-V1	Valid Yes/No	Valid	Yes	All toggles needed
Withdrawal Percentage	WP-V1	0.1–100%	Valid	4.0	Standard percent
	WP-I1	Below minimum	Invalid	0	Not allowed
	WP-I2	Above maximum	Invalid	101	Not allowed

Rolling Average Periods	RA-V1	Valid selection	Valid	3	Coverage of options
Smoothing Rate	SR-V1	Valid smoothing rate	Valid	75%	Edge settings
Withdrawal Frequency	WF-V1	Monthly/Quarterly/Annual	Valid	Annually	Dropdown bounds
Life Expectancy Model	LE-V1	Valid model	Valid	Single Life	Toggle dynamically
Current Age	CA-V1	30–95	Valid	70	Standard baseline
	CA-I1	<30 or >95	Invalid	25, 100	Out of bounds
Simulation Period	SP-V1	5–75 years	Valid	30	Standard planning
	SP-I1	<5 or >75	Invalid	4, 76	Boundary breached
Tax Treatment	TT-V1	Pre-tax/After-tax	Valid	Pre-tax	See toggled fields

Investment Horizon	IH-V1	Valid option	Valid	Simulated Period	Switch needed
Federal Income Tax	FIT-V1	0–100%	Valid	37.0	Practical range
	FIT-I1	Negative or >100%	Invalid	-1, 101	Broken settings
Capital Gains Tax	CGT-V1	0–100%	Valid	20.0	Standard
	CGT-I1	Negative or >100%	Invalid	-5, 105	Invalid border
Dividend Tax	DT-V1	0–100%	Valid	20.0	Typical
	DT-I1	Negative or >100%	Invalid	-2, 102	Boundary
Affordable Care Act Tax	ACAT-V1	0–100%	Valid	3.8	Health-related
	ACAT-I1	Negative or >100%	Invalid	-1, 101	Out of field bounds
State Income Tax	SIT-V1	0–100%	Valid	0.0	Zero state tax

	SIT-I1	Negative or >100%	Invalid	-3, 103	Not legal
Simulation Model	SM-V1	Any dropdown	Valid	Historic Returns	Four models, all need coverage
Time Series Model	TS-V1	Any dropdown	Valid	Normal Returns	Combo for coverage
Risk-Free Rate	RFR-V1	0.1–50%	Valid	3.9	Usual risk-free setting
	RFR-I1	≤0 or >50%	Invalid	0, 51	Out of model
Use Historical Volatility	UHV-V1	Yes/No	Valid	Yes	Dropdown setting
Use Historical Correlations	UHC-V1	Yes/No	Valid	Yes	Dropdown setting
Use Full History	UFH-V1	Yes/No	Valid	Yes	Data toggler field
Start Year	SY-V1	In range (1972–2024)	Valid	1972	Boundary start
	SY-I1	<1972 or >2024	Invalid	1971, 2025	Year invalid

End Year	EY-V1	In range (1972–2024)	Valid	2024	Boundary end
	EY-I1	<1972 or >2024	Invalid	1971, 2025	Year invalid
Bootstrap Model	BM-V1	Valid toggle	Valid	Single Year	Variant setting
Block Min. Years	BMIN-V1	>0 integer	Valid	1	Structure dependent
	BMIN-I1	≤0	Invalid	0, -1	Not allowed
Block Max. Years	BMAX-V1	>0 integer	Valid	20	Typical
	BMAX-I1	≤0	Invalid	0, -5	Block error
Circular Bootstrapping	CB-V1	Yes/No	Valid	Yes	Test toggle
Distribution	DIST-V1	Normal, Fat-Tailed	Valid	Normal Distribution	Test both
Degrees of Freedom	DOF-V1	5–50	Valid	30	Edge-case in fat-tail

Expected Return	ER-V1	0.1–50%	Valid	7.0	Realistic, checks system default
	ER-I1	≤0 or >50%	Invalid	0, 51	System outlier test
Volatility	VOL-V1	0.1–100%	Valid	12.0	Standard range
	VOL-I1	≤0 or >100%	Invalid	0, 101	Edge-case test
Sequence of Returns Risk	SOR-V1	0–10	Valid	No Adjustments	Full dropdown test
Inflation Model	INFM-V1	Historical, Parameterized	Valid	Historical	Combo edge for field dynamics
Inflation Mean	INFMEAN-V1	0–100%	Valid	4.0	Coverage, not extreme
	INFMEAN-I1	<0 or >100%	Invalid	-1, 101	Out of bounds
Inflation Volatility	INFVOL-V1	0–100%	Valid	3.0	Coverage, baseline
	INFVOL-I1	<0 or >100%	Invalid	-1, 101	System error

Rebalancing	REB-V1	Any from dropdown	Valid	Rebalance annually	Option set default
Intervals	INT-V1	Defaults, Custom	Valid	Defaults	Both settings needed
Percentile Intervals	PI-V1	Valid comma-sep numbers	Valid	10,25,50,75,90	Standard config
	PI-I1	Invalid format	Invalid	"10;25;50", "abc"	Separator/format bug
Return Intervals	RI-V1	Valid comma-sep numbers	Valid	0,2.5,5,7.5,10,12.5	System nominal
	RI-I1	Invalid format	Invalid	"0;2.5;5", "xyz"	Separator/format bug
Fee Structure	FS-V1	Valid fee structure	Valid	None	Option toggle full
Asset Ticker	AT-V1	Valid stock ticker	Valid	"AAPL", "VTI"	Test with good code
	AT-I1	Invalid or blank	Invalid	"INVALID", ""	System tosses error
Asset Allocation	AA-V1	In 0–100%	Valid	60	Test split across two assets

	AA-I1	<0	Invalid	-10	Out of bounds
	AA-I2	>100	Invalid	110	Exceeds 100% limit

- **Valid Classes: 52**
- **Invalid Classes: 24**
- **Total Classes: 76**

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10. TEST TACTICAL ALLOCATION MODELS

Tool/Page: TEST TACTICAL ALLOCATION MODELS

URL:https://www.portfoliovisualizer.com/tactical-asset-allocation-model

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Tactical Model	TM-V1	Valid model selection	Valid	3 (Moving Averages for Asset)	Default working model
	TM-V2	Valid alternative model	Valid	2 (Shiller PE Ratio)	Alternative valid model

	TM-I1	Invalid model value	Invalid	99, "invalid"	Out of range/non-existent model
Time Period	TP-V1	Valid month-to-month	Valid	(Month-to-Month)	Valid time period option
	TP-V2	Valid year-to-year	Valid	(Year-to-Year)	Default time period option
	TP-I1	Invalid time period	Invalid	0, 5	Out of range value
Start Year	SY-V1	Valid historical year	Valid	1985 (default)	Within valid year range
	SY-V2	Valid recent year	Valid	2020	Recent valid year
	SY-I1	Year before range	Invalid	1970	Before minimum year
	SY-I2	Year after range	Invalid	2030	After maximum year
First Month	FM-V1	Valid month selection	Valid	1 (January)	Default month

	FM-V2	Valid mid-year month	Valid	6 (June)	Alternative valid month
	FM-I1	Invalid month	Invalid	0, 13	Out of range month
End Year	EY-V1	Valid end year	Valid	2025 (default)	Within valid range
	EY-V2	End year after start	Valid	2000 (when start=1985)	Valid time sequence
	EY-I1	End year before start	Invalid	1980 (when start=1985)	Invalid time sequence
Initial Amount	IA-V1	Valid positive amount	Valid	10000	Default valid amount
	IA-V2	Large valid amount	Valid	1000000	Large but valid investment
	IA-V3	Minimum valid amount	Valid	1	Minimum positive amount
	IA-I1	Zero amount	Invalid	0	Cannot have zero initial investment
	IA-I2	Negative amount	Invalid	-1000	Negative investment invalid

	IA-I3	Non-numeric	Invalid	"abc"	Must be numeric
Cashflows	CF-V1	No cashflows	Valid	0 (None)	Default valid option
	CF-V2	Contribution fixed amount	Valid	1	Valid cashflow type
	CF-V3	Withdrawal fixed amount	Valid	2	Valid cashflow type
	CF-V4	Withdrawal percentage	Valid	3	Valid cashflow type
	CF-I1	Invalid cashflow type	Invalid	4, -1	Out of range option
Contribution Amount	CA-V1	Valid positive contribution	Valid	500	Typical contribution
	CA-V2	Large contribution	Valid	5000	Large but valid
	CA-I1	Zero contribution	Invalid	0	Zero invalid when cashflow enabled
	CA-I2	Negative contribution	Invalid	-100	Negative invalid

Withdrawal Percentage	WP-V1	Valid small percentage	Valid	2.5	Reasonable withdrawal rate
	WP-V2	Valid moderate percentage	Valid	5.0	Moderate withdrawal
	WP-V3	Valid high percentage	Valid	8.0	High but potentially valid
	WP-I1	Zero percentage	Invalid	0.0	Invalid when withdrawal enabled
	WP-I2	Negative percentage	Invalid	-5.0	Negative invalid
	WP-I3	Excessive percentage	Invalid	101.0	Over 100% invalid
Ticker	TK-V1	Valid stock ticker	Valid	"AAPL"	Valid equity ticker
	TK-V2	Valid ETF ticker	Valid	"SPY"	Valid ETF ticker
	TK-V3	Valid mutual fund	Valid	"VFINX"	Valid mutual fund
	TK-I1	Invalid ticker format	Invalid	"A!"	Invalid characters

	TK-I2	Empty ticker	Invalid	""	Required field
	TK-I3	Non-existent ticker	Invalid	"XYZ123"	Unknown security
Lookback Period	LP-V1	Valid predefined period	Valid	3 (3 months)	Default valid period
	LP-V2	Valid long period	Valid	36 (36 months)	Maximum predefined
	LP-V3	Custom period selected	Valid	-1 (Specify...)	Valid custom option
	LP-I1	Invalid period	Invalid	0, 37	Out of range
Lookback period in trading days	LPD-V1	Valid trading days	Valid	63	Default valid days
	LPD-V2	Valid short period	Valid	21	Short valid period
	LPD-V3	Valid long period	Valid	252	Long valid period
	LPD-I1	Zero days	Invalid	0	Must be positive
	LPD-I2	Negative days	Invalid	-10	Negative invalid

	LPD-I3	Excessive days	Invalid	1000	Unrealistically long
Buy Signal	BS-V1	Price vs MA signal	Valid	1 (Price >= MA)	Default valid signal
	BS-V2	MA crossover signal	Valid	2 (MA1 >= MA2)	Alternative valid signal
	BS-I1	Invalid signal type	Invalid	0, 4	Out of range
Type of Moving Average	MAT-V1	Simple moving average	Valid	1 (SMA)	Default valid type
	MAT-V2	Exponential moving average	Valid	2 (EMA)	Alternative valid type
	MAT-I1	Invalid MA type	Invalid	0, 3	Out of range
Assets to hold	AH-V1	Single asset	Valid	1	Minimum valid
	AH-V2	Multiple assets	Valid	5	Moderate portfolio
	AH-V3	Maximum assets	Valid	12	Maximum valid

	AH-I1	Zero assets	Invalid	0	Must hold at least one
	AH-I2	Excessive assets	Invalid	13	Over maximum limit
Allocation Weights	AW-V1	Equal weight	Valid	0	Valid weighting method
	AW-V2	Risk parity	Valid	4	Default valid method
	AW-V3	Inverse volatility	Valid	1	Alternative valid method
	AW-I1	Invalid weighting	Invalid	9, -1	Out of range
Stop Loss	SL-V1	No stop loss	Valid	0	Default valid option
	SL-V2	Asset-level stop loss	Valid	1	Valid stop loss type
	SL-V3	Portfolio stop loss	Valid	2	Valid stop loss type
	SL-I1	Invalid stop loss type	Invalid	3, -1	Out of range

Stop Loss Threshold	SLT-V1	Valid small threshold	Valid	2.0	Default valid threshold
	SLT-V2	Valid moderate threshold	Valid	5.0	Moderate threshold
	SLT-V3	Valid tight threshold	Valid	1.0	Tight threshold
	SLT-I1	Zero threshold	Invalid	0.0	Must be positive
	SLT-I2	Negative threshold	Invalid	-2.0	Negative invalid
	SLT-I3	Excessive threshold	Invalid	50.0	Unrealistically high
Trading Frequency	TF-V1	Signal-based trading	Valid	-1 (At Signal)	Valid frequency
	TF-V2	Monthly trading	Valid	1 (Monthly)	Default valid frequency
	TF-V3	Quarterly trading	Valid	3 (Quarterly)	Alternative valid frequency
	TF-I1	Invalid frequency	Invalid	5, -2	Out of range

Trade Execution	TE-V1	End of month execution	Valid	0	Default valid execution
	TE-V2	Next close execution	Valid	1	Alternative valid execution
	TE-I1	Invalid execution	Invalid	2, -1	Out of range
Leverage Type	LT-V1	No leverage	Valid	0	Default valid option
	LT-V2	Fixed leverage ratio	Valid	1	Valid leverage type
	LT-V3	Fixed debt amount	Valid	2	Valid leverage type
	LT-I1	Invalid leverage type	Invalid	3, -1	Out of range
Leverage Ratio	LR-V1	Valid moderate leverage	Valid	50.0	50% leverage
	LR-V2	Valid low leverage	Valid	25.0	25% leverage
	LR-V3	Valid high leverage	Valid	75.0	75% leverage

	LR-I1	Negative leverage	Invalid	-25.0	Negative invalid
	LR-I2	Excessive leverage	Invalid	101.0	Over 100% invalid
Debt Amount	DA-V1	Valid debt amount	Valid	5000	Reasonable debt
	DA-V2	Large debt amount	Valid	50000	Large but valid
	DA-I1	Zero debt	Invalid	0	Invalid when leverage enabled
	DA-I2	Negative debt	Invalid	-5000	Negative invalid
Debt Interest	DI-V1	Valid low interest	Valid	2.0	Low interest rate
	DI-V2	Valid moderate interest	Valid	5.0	Moderate interest rate
	DI-V3	Valid high interest	Valid	10.0	High interest rate
	DI-I1	Negative interest	Invalid	-2.0	Negative invalid

	DI-I2	Excessive interest	Invalid	50.0	Unrealistically high
Maintenance Margin	MM-V1	Valid low margin	Valid	25.0	Default valid margin
	MM-V2	Valid high margin	Valid	50.0	Conservative margin
	MM-I1	Zero margin	Invalid	0.0	Must be positive
	MM-I2	Negative margin	Invalid	-25.0	Negative invalid
	MM-I3	Excessive margin	Invalid	101.0	Over 100% invalid
Benchmark	BM-V1	No benchmark	Valid	"" (None)	Default valid option
	BM-V2	Vanguard benchmark	Valid	"VFINX"	Valid benchmark
	BM-V3	Custom ticker selected	Valid	-1 (Specify Ticker)	Valid custom option
	BM-I1	Invalid benchmark	Invalid	99	Out of range

Portfolio Asset Allocation	PA-V1	Valid single asset	Valid	"SPY" with 100%	Single asset portfolio
	PA-V2	Valid multi-asset balanced	Valid	["SPY","BND"] with	Balanced portfolio
	PA-V3	Valid complex portfolio	Valid	5 assets with various allocations	Diversified portfolio
	PA-I1	Empty portfolio	Invalid	No assets	Must have at least one asset
	PA-I2	Allocation sum ≠ 100%	Invalid	Assets sum to 90% or 110%	Must total exactly 100%
	PA-I3	Negative allocation	Invalid	-10% allocation	Allocations must be positive
	PA-I4	Duplicate assets	Invalid	"SPY" listed twice	Unique assets required
Risk Adjustment Levels	RA-V1	Valid risk rules	Valid	Standard Z-score thresholds	Valid risk configuration
	RA-V2	Empty risk rules	Valid	All "Select" options	No active risk rules
	RA-I1	Inconsistent thresholds	Invalid	Derisk at 1.0, Rerisk at 2.0	Thresholds must be ordered

	RA-I2	Invalid percentage changes	Invalid	150% change	Changes must be ≤100%

CONFIG FORMS

1. ASSET BACKFILLS CONFIGURATION

Tool/Page: ASSET BACKFILLS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-backfills

Field	**Class ID**	**Class Description**	**Valid/Invalid**	**Representative Values**	**Rationale**
Backfill Oldest Share Class	BOSC-V1	No backfill	Valid	No	Default option
	BOSC-V2	Yes backfill	Valid	Yes	Enable backfill feature
Asset Ticker	AT-V1	Valid ticker selected	Valid	AAPL, SPY, VTI	Recognized securities
	AT-V2	Default selection	Valid	Select asset ticker	No ticker selected yet

	AT-I1	Invalid/unknown ticker	Invalid	BADTICKER	Non-existent security
Backfill Ticker	BT-V1	Valid backfill ticker	Valid	AAPLX, SPYX	Valid alternate ticker
	BT-V2	Same as asset ticker	Valid	AAPL (matches Asset)	Same ticker for both
	BT-V3	Default selection	Valid	Select asset ticker	No backfill ticker selected
	BT-I1	Invalid backfill ticker	Invalid	BADBACKFILL	Non-existent backfill security
	BT-I2	Mismatched ticker	Invalid	MSFT (when Asset=AAPL)	Incompatible backfill

2. MANAGE REPORTS CONFIGURATION

Tool/Page: MANAGE REPORTS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-reports

Field	Class ID	Valid/Invalid	Representative Values	Rationale
Company Name	CN-V1/2	Valid	"Portfolio Visualizer", 64-char	Default/max length

	CN-I1/2	Invalid	"", 65-char	Empty/too long
Include Logo	IL-V1/2	Valid	"Yes", "No"	Both options
	IL-I1	Invalid	"maybe"	Out of range
Logo Image	LI-V1/2	Valid	PNG/JPEG/GIF, (empty)	Supported formats/optional
	LI-I1/2	Invalid	.txt/.doc, 10MB+ file	Wrong format/too large
Footer Text/Link	PFT/L-V1/2	Valid	"Company", "https://example.com"	Standard text/URL
	PFL-I1	Invalid	"not-a-url"	Invalid format
Cover Page	UCP-V1/2	Valid	"Yes", "No"	Both options
Cover Page PDF	CP-V1/2	Valid	.pdf file, (empty)	PDF/optional
	CP-I1	Invalid	.jpg/.png	PDF required
Toggles	Toggle-V1/2	Valid	"Yes", "No"	All yes/no fields
Custom Disclosures	CD-V1/2/3	Valid	0, 1, 2	Replace/Above/Below
	CD-I1	Invalid	3, -1	Out of range
Disclosures	DISC-V1/2/3	Valid	"Custom text", "", 1000+ chars	Text/empty/long
Report Font	RF-V1/2	Valid	"Roboto", "Lato"	Default/alternative
	RF-I1	Invalid	"InvalidFont"	Non-existent
Chart Colors	CC-V1/2	Valid	"Palette 1", "Custom"	Predefined/custom

	CC-I1	Invalid	"Palette 5"	Out of range
Color List	CL-V1/2	Valid	"#FF0000 #00FF00", ""	Valid hex/empty
	CL-I1	Invalid	"#ZZZ #12345"	Invalid formats
Color Pickers	CPick-V1/2	Valid	"#00649E", "#FF0000"	Default/alternative
	CPick-I1	Invalid	"red", "#ZZZ"	Invalid format

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3. MANAGE FEES CONFIGURATION

Tool/Page: MANAGE FEES CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-fees

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Name	N-V1	Valid name	Valid	Management Fee	Standard fee name
	N-V2	Long name	Valid	50-char name	Max practical length
	N-I1	Empty	Invalid	""	Required field
	N-I2	Special characters	Invalid	"Fee@#$%"	Invalid chars
Type	T-V1	Fixed Percentage	Valid	2	Default

	T-V2	Fixed Amount	Valid	1	
	T-V3	Tiered Percentage	Valid	3	
	T-V4	Tiered Amount	Valid	4	
	T-V5	Performance Based	Valid	5	
	T-I1	Invalid type	Invalid	6, 0	Out of range
Annual Percentage	AP-V1	Valid %	Valid	1.0	Default
	AP-V2	Min valid %	Valid	0.1	LB
	AP-V3	High valid	Valid	5.0	
	AP-I1	Zero %	Invalid	0.0	Not allowed
	AP-I2	Negative	Invalid	-1.0	Not allowed
	AP-I3	Excessive	Invalid	101.0	UB+1
Annual Minimum	AM-V1	Valid amount	Valid	1500	Default
	AM-V2	Min valid	Valid	1	LB
	AM-V3	Large valid	Valid	1,000,000	UB
	AM-I1	Zero	Invalid	0	
	AM-I2	Negative	Invalid	-100	
Incentive Fee	IF-V1	Valid incentive	Valid	20.0	Default

	IF-V2	Min valid	Valid	5.0	LB
	IF-V3	High valid	Valid	50.0	
	IF-I1	Zero/Negative	Invalid	0.0, -5.0	Not allowed
	IF-I2	Excessive	Invalid	101.0	UB+1
Hurdle Rate	HR-V1	Mid valid	Valid	5.0	Default
	HR-V2	Min valid	Valid	1.0	LB
	HR-V3	High valid	Valid	25.0	UB
	HR-I1	Negative	Invalid	-5.0	
Payment Schedule	PS-V1	Monthly	Valid	2	
	PS-V2	Quarterly	Valid	3	
	PS-V3	Annually	Valid	4	Default
	PS-I1	Invalid	Invalid	1, 5	Out of range
Tier Assets	TA-V1	Ascending valid	Valid	250000, 500000	Normal sequence
	TA-I1	Decreasing	Invalid	500000, 250000	Not allowed
	TA-I2	Duplicates	Invalid	250000, 250000	Not allowed
	TA-I3	Negative	Invalid	-100000	Not allowed

4. MARKET EXPECTATIONS CONFIGURATION

Tool/Page: MARKET EXPECTATIONS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-market-expectations

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Type	TYP-V1	Asset Class type	Valid	1	Default valid type
	TYP-V2	Ticker type	Valid	2	Alternative valid type
	TYP-I1	Invalid type	Invalid	0, 3	Out of range
Asset Class	AC-V1	Valid US Equity	Valid	"LargeCapBlend"	Valid asset class
	AC-V2	Valid International	Valid	"EmergingMarket"	Valid international
	AC-V3	Valid Fixed Income	Valid	"TotalBond"	Valid bond class
	AC-V4	Valid Alternative	Valid	"REIT"	Valid alternative
	AC-I1	Empty selection	Invalid	""	Must select asset class

	AC-I2	Invalid class	Invalid	"InvalidClass"	Non-existent class
Ticker	TIK-V1	Valid stock ticker	Valid	"AAPL"	Valid equity ticker
	TIK-V2	Valid ETF ticker	Valid	"SPY"	Valid ETF ticker
	TIK-I1	Invalid ticker format	Invalid	"A!"	Invalid chars
	TIK-I2	Empty ticker	Invalid	""	Must enter ticker
	TIK-I3	Non-existent ticker	Invalid	"XYZ123"	Unknown security
Return	RET-V1	Positive return	Valid	8.5	Typical positive return
	RET-V2	Negative return	Valid	-2.0	Valid negative return
	RET-V3	Zero return	Valid	0.0	Zero return valid
	RET-V4	High positive return	Valid	25.0	High but possible
	RET-I1	Extreme high return	Invalid	101.0	Unrealistically high

	RET-I2	Extreme negative	Invalid	-101.0	Unrealistically low
Volatility	VOL-V1	Low volatility	Valid	5.0	Low risk asset
	VOL-V2	Moderate volatility	Valid	15.0	Moderate risk
	VOL-V3	High volatility	Valid	30.0	High risk asset
	VOL-I1	Zero volatility	Invalid	0.0	Must be positive
	VOL-I2	Negative volatility	Invalid	-5.0	Cannot be negative
	VOL-I3	Extreme volatility	Invalid	101.0	Unrealistically high
Row Config	ROW-V1	Complete row	Valid	Type+Asset+Return+Vol	All populated
	ROW-V2	Partial row	Valid	Type+Asset only	Return/Vol can be empty
	ROW-I1	Incomplete type-asset	Invalid	Type without asset	Must have asset/ticker
	ROW-I2	Asset without type	Invalid	Asset without type	Type required

5. MARKET REGIMES CONFIGURATION

Tool/Page: MARKET REGIMES CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-market-regimes

Field	Class ID	Class Description	Valid / Invalid	Representative Values	Rationale
Name	N-V1/V2	Valid / long name	Valid	"Vol Regime", 128-ch	Nominal/Boundary
	N-I1/I2	Empty / too long	Invalid	"", 129-char	Required/limit
Description	DESC-V1/2/3	Any/empty/long desc	Valid	"desc", "", 500-ch	Optional/boundary
Regime Data Source	RDS-V1/2	Existing/File	Valid	true/false	Data source
	RDS-I1	Invalid	Invalid	"maybe"	Out of range
Time Series	TS-V1/2	Stock/ETF ticker	Valid	VIX/SPY	Ticker input
	TS-I1/I2	Empty/invalid	Invalid	"", "INVALID"	Required/unknown
Series Type	ST-V1/2	Index/Returns	Valid	2/1	Type select

	ST-I1	Disabled value	Invalid	10	Monthly labels
Regime Data File	RDF-V1/2	Valid CSV/XLSX	Valid	.csv/.xlsx	File support
	RDF-I1/I2	Invalid/extreme	Invalid	.txt/.pdf, empty	Not supported/empty
Regime Definitions	RD-V1-6	6 types	Valid	200,300,4,5,10,100	All definitions
	RD-I1	Invalid	Invalid	999	Out of range
Smoothing Factor	SF-V1-3	0/6/12 months	Valid	0/6/12	None/mod/max
	SF-I1	Invalid	Invalid	13	Out of range
Default Regime Type	DRT-V1-3	Label/empty/long	Valid	"Normal"/""/50-ch	Optional/boundary
Regime Levels	CT-V1-3	>=/< /select	Valid	-1/1/0	Comparison ops
	CT-I1	Invalid	Invalid	2	Out of range
Threshold	TH-V1-3	Any/neg/zero	Valid	20.5/-15/0	Allowed for thresholds

	TH-I1	Extreme	Invalid	999999.9	Out of range
Regime Label	RL-V1/2	Label/empty	Valid	"High"/""	Optional/boundary
	RL-I1	Invalid label	Invalid	"" when threshold set	Required if threshold
Dislocation Period	DP-V1-3	short/med/long	Valid	1/6/12	Boundary
	DP-I1	Invalid	Invalid	13	Out of range
Dislocation Direction	DD-V1/2	Up/Down	Valid	1/2	Direction
	DD-I1	Invalid	Invalid	3	Out of range
Regime Sort Order	RSO-V1-3	Chrono/Alpha/Numeric	Valid	0/1/2	All orders
	RSO-I1	Invalid	Invalid	3	Out of range

4. Boundary Identification (BVA)

For each numeric or date field, identify its boundaries and test values just below and above those boundaries.

1. SIGNUP FORM

Tool/Page: Sign-Up
URL: https://www.portfoliovisualizer.com/sign-up

Field	LB	LB−1 (Just Below)	Nominal (Inside)	UB	UB+1 (Just Above)	Notes
First Name	1 character ("A")	0 characters (blank)	"Uzair" (5 chars)	50 characters	51 characters	Most name fields accept 1–50 chars; blank should trigger "required" error.
Last Name	1 character ("M")	0 (blank)	"Majeed"	50 characters	51 characters	Same rule as first name — test blank and overly long input.
Business Email	6 chars ("a@b.co")	<6 ("a@b.c")	"uzair@gmail.com"	254 characters	255 characters	Email standard max length = 254; shorter or malformed should fail.

Password	8 characters (“Abc12345”)	7 characters (“Abc1234”)	“Uzair12345”	20 characters	21 character s	Assume password must be 8–20 chars; shorter or longer should reject.
Verify Password	Matches password exactly	Mismatch (“Abc1234” vs “Abc12345”)	Same as “Create Password”	Same as password	—	Must exactly match; any mismatch should fail validation.
Profile Type (Dropdown)	Valid option selected	None selected	“Individual Investor”	—	—	Only valid listed options accepted; blank or default “Select…” invalid.
Country (Dropdown)	Valid country selected	None selected	“Pakistan”	—	—	Must select a valid country; cannot be empty.
Market Region (Dropdown)	Valid option selected	None selected	“North America”	—	—	Required field; empty selection invalid.
Company (Optional Text)	0 (blank)	—	“FAST University”	100 characters	101 character s	Likely optional; test max field length overflow.

Firm Type (Dropdown)	Valid selection (if required)	Blank (when required)	“Asset Manager”	—	—	Only enforced for business profiles.
reCAPTCHA	Checked (validated)	Unchecked	—	—	—	Required for form submission; unchecked blocks submit.

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2. LOGIN FORM

Tool/Page: Login

URL: https://www.portfoliovisualizer.com/login

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Email	6 chars ("a@b.co")	5 chars ("a@b.c")	"user@gmail.com"	254 chars	255 chars	Email standard max length
Password	1 character	0 (blank)	"Password 123"	No visible limit	-	Test blank and reasonable lengths

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3. BACKTEST PORTFOLIO FORM

Tool/Page: Backtest Portfolio

URL: https://www.portfoliovisualizer.com/backtest-portfolio

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Initial Amount	1	0	10,000	999999999999999999999	10000000000000000000	Usual/max investment
Allocation %	0	-1	50	100	101	Per-asset range
Alloc sum	100	99	100	101	101	Sum must be 100
Contribution Amt	1	0	1000	100000	100001	Positive only
Withdrawal %	0.1	0	4	100	100.1	Only 0<%≤100 valid

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4. FUND FACTOR REGRESSION

Tool/Page: Mutual Fund and ETF Factor Regressions

URL: https://www.portfoliovisualizer.com/etf-and-mutual-fund-factor-regression

Since ALL FIELDS ARE DROP DOWNS , THERE CAN'T BE ANY BOUNDARY VALUE ANALYSIS IN THIS CASE

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5. ASSET CORRELATION FORM

Tool/Page: ASSET CORRELATION FORM

URL:https://www.portfoliovisualizer.com/asset-correlations

Field	LB	LB−1 (Just Below)	Nominal (Inside)	UB	UB+1 (Just Above)	Notes
Tickers	1 ticker	0 tickers (empty)	4 tickers (VTI VNQ GLD BND)	~50 tickers	>50 tickers	Test min (1), typical (4), max reasonable count
Ticker Length	1 char ("A")	0 chars	3-5 chars (VTI, VXUS)	6 chars (VFINX)	>6 chars	Individual ticker symbol length
Start Date	Earliest available (e.g., 01/01/1900)	Before earliest (01/01/1900)	01/01/2010	Most recent (e.g., 10/24/2025)	Future (01/01/2030)	Date range boundaries
End Date	Start Date (same day)	Before Start Date	12/31/2020	Most recent (10/24/2025)	Future (01/01/2030)	Must be ≥ Start Date
Rolling Correlation (Days)	20 days	<20 (not possible)	60 days	120 days	>120 (not possible)	Discrete dropdown values

Rolling Correlation (Months)	12 months	<12 (not possible)	36 months	60 months	>60 (not possible)	Discrete dropdown values

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6. FUND SCREENER FORM

Tool/Page: FUND SCREENER FORM

URL:https://www.portfoliovisualizer.com/fund-screener

Since ALL FIELDS ARE DROP DOWNS , THERE CAN'T BE ANY BOUNDARY VALUE ANALYSIS IN THIS CASE

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7. MANAGER PERFORMANCE ANALYSIS FORM

Tool/Page: MANAGER PERFORMANCE ANALYSIS FORM

URL:https://www.portfoliovisualizer.com/manager-performance

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Rolling Period	3 M	--	36 M	60 M	--	Dropdown only
Start Date	Earliest	--	01/01/2015	Today	Future	Format/validity
End Date	Earliest	--	12/31/2021	Today	Future	Format/validity

8. PORTFOLIO OPTIMIZATION FORM

Tool/Page: PORTFOLIO OPTIMIZATION FORM

URL:https://www.portfoliovisualizer.com/optimize-portfolio

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Start Year	1985	1984	2000	2025	2026	Data range
End Year	1985	1984	2020	2025	2026	Data range
Allocations	0	-1	50	100	101	% per asset
Min Weights	0	-1	10	100	101	Constraint
Max Weights	0	-1	50	100	101	Constraint
Expected Returns	0.1	0	8.0	50.0	50.1	%
Volatilities	0.1	0	15.0	100	100.1	%
Target Return	0.1	0	8.0	50.0	50.1	%

Target Volatility	**0.1**	**0**	**15.0**	**100**	**100.1**	**%**
Target Tracking Err	**0.1**	**0**	**2.0**	**50.0**	**50.1**	**%**
Target Monthly CVaR	**0.1**	**0**	**5.0**	**50.0**	**50.1**	**%**

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9. MONTE CARLO SIMULATION

Tool/Page: MONTE CARLO SIMULATION

URL:https://www.portfoliovisualizer.com/monte-carlo-simulation

Field	**LB**	**LB−1**	**Nominal**	**UB**	**UB+1**	**Notes**
Initial Amount	**1**	**0**	**1,000,000**	**10,000,000**	**10,000,001**	**Portfolio value range**
Withdrawal Amount	**1**	**0**	**45,000**	**1,000,000**	**1,000,001**	**Withdrawal limits**
Withdrawal Percentage	**0.1**	**0**	**4.0**	**100.0**	**100.1**	**Percentage range (0.1–100%)**
Current Age	**30**	**29**	**70**	**95**	**96**	**Age range for life expectancy**

Simulation Period	**5**	**4**	**30**	**75**	**76**	**Years range (5–75)**
Federal Income Tax	**0**	**-1**	**37.0**	**100.0**	**101.0**	**Tax rate percentage**
Capital Gains Tax	**0**	**-1**	**20.0**	**100.0**	**101.0**	**Tax rate percentage**
Dividend Tax	**0**	**-1**	**20.0**	**100.0**	**101.0**	**Tax rate percentage**
Affordable Care Act Tax	**0**	**-1**	**3.8**	**100.0**	**101.0**	**Tax rate percentage**
State Income Tax	**0**	**-1**	**0.0**	**100.0**	**101.0**	**Tax rate percentage**
Risk-Free Rate	**0.1**	**0**	**3.9**	**50.0**	**50.1**	**Interest rate percentage**
Start Year	**1972**	**1971**	**2000**	**2024**	**2025**	**Historical data range**
End Year	**1972**	**1971**	**2020**	**2024**	**2025**	**Historical data range**
Block Min. Years	**1**	**0**	**5**	**50**	**51**	**Block size minimum**
Block Max. Years	**1**	**0**	**10**	**50**	**51**	**Block size maximum**
Expected Return	**0.1**	**0**	**7.0**	**50.0**	**50.1**	**Return percentage**

Volatility	**0.1**	**0**	**12.0**	**100.0**	**100.1**	**Volatility percentage**
Inflation Mean	**0**	**-1**	**4.0**	**100.0**	**101.0**	**Inflation rate percentage**
Inflation Volatility	**0**	**-1**	**3.0**	**100.0**	**101.0**	**Inflation volatility %**
Asset Allocation	**0**	**-1**	**50**	**100**	**101**	**Allocation percentage**

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10. TEST TACTICAL ALLOCATION MODELS

Tool/Page: TEST TACTICAL ALLOCATION MODELS

URL:https://www.portfoliovisualizer.com/tactical-asset-allocation-model

Field	LB	LB−1 (Just Below)	Nominal (Inside)	UB	UB+1 (Just Above)	Notes
Initial Amount	1	0	10000	999999999	1000000000	Positive integers only, upper bound estimated
Contribution Amount	1	0	500	999999999	1000000000	Only relevant when cashflows enabled

Withdrawal Percentage	0.1	0.0	4.0	100.0	100.1	Percentage 0.1-100.0%, step 0.1
Adjustment Percentage	0.1	0.0	4.0	100.0	100.1	Withdrawal percentage field
Ticker	1 char	0 chars	"AAPL"	10 chars	11 chars	Ticker length typically 1-10 characters
Tickers	1 char	0 chars	"SPY, BND"	500 chars	501 chars	Multiple tickers, comma separated
Volatility Target	0.1	0.0	9.0	50.0	50.1	Annual volatility target 0.1-50.0%
Window Size in Days	1	0	63	500	501	Trading days lookback
Window Size in Days 2	1	0	252	500	501	Second trading days lookback
Volatility Window Size in Days	1	0	21	500	501	Volatility calculation period
Timing Period 1	1	0	5	1000	1001	Custom lookback period length

Timing Weight 1	0	-1	100	100	101	Weight percentage 0-100%
Stop Loss Threshold	0.1	0.0	2.0	25.0	25.1	Stop loss percentage 0.1-25.0%
Max Derisk Percentage	0	-1	100	100	101	Percentage 0-100%
Derisk Increment	1	0	25	100	101	Percentage 1-100%
Rerisk Increment	1	0	25	100	101	Percentage 1-100%
Expression	1 char	0 chars	"price > ma(20)"	1000 chars	1001 chars	Trading rule expression
Leverage Ratio	0.1	0.0	50.0	100.0	100.1	Leverage percentage 0.1-100.0%
Debt Amount	1	0	5000	999999999	1000000000	Positive integer debt amount
Debt Interest	0.1	0.0	5.0	25.0	25.1	Interest rate 0.1-25.0%
Maintenance Margin	1.0	0.9	25.0	100.0	100.1	Margin requirement 1.0-100.0%

Threshold 1	-10.0	-10.1	2.0	10.0	10.1	Z-score threshold range
Risk Change 1	0	-1	100	100	101	Risk change percentage 0-100%
Portfolio Allocation 1	0.1	0.0	25.0	100.0	100.1	Asset allocation percentage
Portfolio Total Allocation	100.0	99.9	100.0	100.0	100.1	Must sum to exactly 100%

CONFIG FORMS

1. ASSET BACKFILLS CONFIGURATION

Tool/Page: ASSET BACKFILLS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-backfills

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Number of Asset Pairs	1	0	5	10	11	Must have at least 1, max 10 pairs

Number of Backfill	0	-1	5	10	11	Can leave some or all blank

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2. MANAGE REPORTS CONFIGURATION

Tool/Page: MANAGE REPORTS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-reports

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Company Name Length	1 char	0 chars	"Portfolio Visualizer"	64 chars	65 chars	Max 64 characters
Footer Text Length	0 chars	N/A	"Company Name"	200 chars	201 chars	Reasonable max
Disclosures Length	0 chars	N/A	"Standard disclosures"	5000 chars	5001 chars	Large text area
Color List Length	0 chars	N/A	"#FF0000 #00FF00"	500 chars	501 chars	Multiple colors
File Size (Logo)	1 byte	0 bytes	100KB file	5MB	6MB	Reasonable image size
File Size (PDF)	1 byte	0 bytes	500KB PDF	10MB	11MB	Reasonable PDF size

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3. MANAGE FEES CONFIGURATION

Tool/Page: MANAGE FEES CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-fees

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Name Length	1char	0char	"Management Fee"	100char	101char	String lengths
Annual Percentage	0.1	0.0	1.0	100.0	100.1	% (step 0.1–100), UB+1
Annual Minimum	1	0	1500	999999999	1000000000	Only positive integers
Incentive Fee	0.1	0.0	20.0	100.0	100.1	%
Hurdle Rate	0.1	0.0	5.0	50.0	50.1	%
Annual Increase	0.0	-0.1	2.0	25.0	25.1	%
Tier Assets	1	0	250000	999999999	1000000000	Only positive
Tier Percentage	0.01	0.00	1.00	100.00	100.01	% step, typically to 2 d.p
Tier Amount	1	0	2500	999999999	1000000000	Only positive

4. MARKET EXPECTATIONS CONFIGURATION

Tool/Page: MARKET EXPECTATIONS CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-market-expectations

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Return	-100.0	-100.1	8.5	100.0	100.1	Range -100% to +100%
Volatility	0.1	0.0	15.0	100.0	100.1	Volatility 0.1% to 100%
Ticker Length	1 char	0 char	"SPY"	10 char	11 char	Ticker length 1-10 chars
Number of Rows	1	0	5	100	101	Min 1, max 100 rows
Empty Rows	0	N/A	5	10	11	Can have empty rows

5. MARKET REGIMES CONFIGURATION

Tool/Page: MARKET REGIMES CONFIGURATION

URL:https://www.portfoliovisualizer.com/manage-market-regimes

Field	LB	LB−1	Nominal	UB	UB+1	Notes
Name Length	1 char	0	"Vol Regime"	128 chars	129 chars	Max 128 chars
Description Len	0	N/A	"desc"	1000 chars	1001 chars	
Threshold	-1000.0	-1000.1	25.5	1000.0	1000.1	-1000 to 1000
Smoothing Period	0	-1	6	12	13	0-12 months
DislocationPeriod	1	0	6	12	13	1-12 months
File Size	1 byte	0	100KB	10MB	11MB	Reasonable
Label Length	0	N/A	"Bull"	100 chars	101 chars	Reasonable

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5. Minimal Test Set

TC ID	Tools/URL	Preconditions	Inputs (Key Fields Only)	Expected Outcome	Classes Hit	Boundaries Hit
TC-S01	Signup Form	None	All valid fields: Profile Type=Academic Country=Pakistan Region=North America First Name=Uzair Last Name=Majeed Email=uzairmjd886@gmail.com Company=(empty) Firm Type=(empty) Password=Abc12345 Verify=Abc12345 reCAPTCHA=checked	Account created successfully	PT-V1, C-V1, MR-V1, FN-V1, LN-V1, EM-V1, CO-I1, FT-I2, PW-V1, VP-V1, RC-V1	All nominal values

TC-S02	Signup Form	None	Multiple required fields missing: Profile Type=(not selected) Country=(Pakistan) Region=(North America) First Name=(empty) Last Name=(empty) Email=(empty) Password=(empty) Verify=(empty) reCAPTCHA=unchecked	Multiple validation errors for all required fields	PT-I1, C-I1, MR-I1, FN-I1, LN-I1, EM-I1, PW-I2, VP-I2, RC-I1	FN LB-1, LN LB-1, PW LB-1
TC-S03	Signup Form	None	Multiple invalid formats: Profile Type=Individual Investor Country=Pakistan Region=North America First Name=Uzair123 Last Name=Majeed@ Email=uzair.gmail.com Password=Abc123	Multiple format validation errors	FN-I2, LN-I2, EM-I1, PW-I1, VP-I1	PW LB-1, EM LB-1

			Verify=Different123 reCAPTCHA=checke d			
TC-S04	Signup Form	None	Boundary maximum values: Profile Type=Individual Investor Country=Pakistan Region=North America First Name= (50 chars) Last Name= (50 chars) Email=narrator886 @gmail.com Password=Abc1234 5678901234567 (20 chars) Verify=Abc1234567 8901234567 reCAPTCHA=check ed	Account created successfully	FN-V1, LN-V1, EM-V1, PW-V1, VP-V1	FN UB, LN UB, EM LB, PW UB

TC-S05	Signup Form	None	Boundary exceeded values: Profile Type=Individual Investor Country=Pakistan Region=North America First Name= (51 chars) Last Name= (51 chars) Email= (255 chars) Password=Abc1234 (7 chars) Verify=Abc1234 reCAPTCHA=checked	Multiple length validation errors	FN-I2, LN-I2, EM-I1, PW-I1	FN UB+1, LN UB+1, EM UB+1, PW LB
TC-LO1	Login Form	Registered Account	**Successful login:** • Email = registered@example.com • Password = CorrectPass123 • Stay signed in = checked	Successful login redirect; remember me set	EM-V1, PW-V1, ST-V1	Nominal values

TC-LO2	Login Form	None	**Multiple field failures:** • Email = (empty) • Password = (empty) • Stay signed in = unchecked	Validation errors for both required fields	EM-I1, PW-I1, ST-V2	Email LB-1, Password LB-1
TC-LO3	Login Form	None	**Format failures + BVA upper:** • Email = 256 chars (UB+1 - too long) • Password = abcdefg (7 chars - too short) • Stay signed in = unchecked	"Invalid email or password" error (covers both format and auth failures)	EM-I2, EM-I4, PW-I3, ST-V2	Email UB+1, Password LB-1
TC-LO4	Login Form	None	**Long Email** • Email = unregistered email • Password = wrong password • Stay signed in = unchecked	"Invalid email or password" error	EM-I3, PW-I2, ST-V2	Nominal

TC-BP01	Backtest Portfolio	None	Time Period=Year-to-Year, Start=2000, End=2020, Initial Amount=10000, Cashflows=None, Rebalancing=Annual, Leverage=None, Dividends=Yes, Assets=VTSMX(60), VBMFX(40), Benchmark=VFINX, Portfolio Name=Default	Successful run	TP-V1, SY-V1, EY-V1, IA-V1, CF-V1, RB-V2, LT-V1, RD-V1, AA-V1, BM-V1, PN-V1, All nominal	nominal
TC-BP02	Backtest Portfolio	None	Start=2020, End=2010 (inverted, invalid), Amount=0, Cashflows=Withdraw fixed (shows fields, enter Withdraw Amt=0), Rebalancing=Bands (shows Bands=0), Assets=VTSMX(50), VGTSX(50), VGSIX(10) (sum>100, over-allocation), Benchmark="" (empty)	Multi-error: invalid range, amount, withdrawal, bands, allocation, missing benchmark	SY-I1, EY-I1, IA-I1, CF-V3, WA-I1, RB-V3, BA-I1, AA-I1, BM-I1, (multiple LB-1)	Initial Amount: LB-1; Withdraw Amount: LB-1; Bands Amount: LB-1; Asset Allocation: UB+1 (sum>100);
TC-BP03	Backtest Portfolio	None	Time Period=Month-to-Month, Start=1985, End=2025 , Initial=1 (LB), Cashflows=Withdraw %, Withdrawal %=100 (UB), Leverage=Fixed Ratio (shows Leverage=1.5),	Success, advanced/dynamic	TP-V2, SY-V1, EY-V1, IA-V1, CF-V4, WP-V1, LT-V3, LA-V1, AA-V1, All valid LBs/UBs	Initial Amount: LB; Withdraw %: UB; Asset Allocation: UB

			Factor Regression=Yes, Assets=VTSMX(100) (allocation UB)			
TC-BP04	Backtest Portfolio	None	Leverage Type=Fixed Debt (shows Leverage Amt=Invalid), Portfolio Names=Custom ("Test"), Assets=VTSMX(-10), VGTSX(110) (mix of <0, >100)	Multi-error: negative leverage, bad allocations	LT-V2, LA-I1, PN-V2, AA-I1 (neg/overflow), LB-1 allocations	Leverage Amount: LB-1; Asset Allocation: LB-1, UB+1
TC-BP05	Backtest Portfolio	None	Start=1985 , End=2025 , Initial Amount=1,000,001 (UB+1), Assets=VTSMX(101) (alloc UB+1), Cashflows=Contribute, Contribution=0 (invalid), Benchmark=invalid	Multi-error: out-of-range/all UB+1s	SY-I1, EY-I1, IA-I1, CA-I1, AA-I1, BM-I1, (all UB+1s)	Initial Amount: UB+1; Contribution Amount: LB-1; Asset Allocation: UB+1;
TC-FF01	Fund Factor Regression	None	Equity Factor Returns:Fama-French Stock Market:US Equity Factor Model:3-Factor Fixed Income Model:None Fund Type:ETF Fund Category:US Equity Time Period:24 Months R^2 Threshold:70% Statistical Significance:none checked	Success, table of significant results	EF-V1, SM-V1, EM-V2, FI-V1, FT-V2, FC-V2, TP-V1, RS-V1, SS-V1	Nominal

TC-FF02	Fund Factor Regression	None	Equity Factor Returns:AQR Stock Market:Intl Ex-US Equity Factor Model:6-Factor Fixed Income Model:None Fund Type:Mutual Fund Fund Category:Intl Equity Time Period:48 Months R^2 Threshold:80% Statistical Significance:some checked	Success, table of filtered results	EF-V2, SM-V2, EM-V5, FI-V3, FT-V3, FC-V3, TP-V3, RS-V2, SS-V2	Nominal
TC-FF03	Fund Factor Regression	None	Equity Factor Returns:Alpha Architect Stock Market: US Equity Factor Model:4-Factor Fixed Income Model:Term+Credit Fund Type:Closed-End Fund Fund Category:Fixed Income Time Period:60 Months R^2 Threshold:90% Statistical Significance:all checked	Success, table of filtered results	EF-V3, SM-V3, EM-V3, FI-V2, FT-V4, FC-V4, TP-V4, RS-V3, SS-V3	Nominal

TC-FF04	Fund Factor Regression	None	Equity Factor Returns:Fama-French Stock Market:US Equity Factor Model:None Fixed Income Model:None Fund Type:All Fund Category:Alternatives Time Period:Maximum R^2 Threshold:95% Statistical Significance:all checked	Success, table of filtered results	EF-V1, SM-V1, EM-V1, FI-V1, FT-V1, FC-V5, TP-V5, RS-V4, SS-V3	Nominal
TC-AC01	Asset Correlation	None	Tickers=VTI Start Date=Earliest allowed End Date=Start Date Correlation Basis=Daily Rolling=20	Success correlation matrix (LB cases)	TK-V1, CB-V1, RT-V1	Ticker LB, Start Date LB, End Date LB, Rolling LB
TC-AC02	Asset Correlation	None	Tickers=VTI VNQ GLD BND (nominal) StartDate=01/01/2010 (nominal) End Date=12/31/2020 (nominal) Correlation Basis=Monthly Rolling=36	Success correlation matrix	TK-V2, SD-V2, ED-V2, CB-V2, RM-V2	Nominal

TC-AC03	Asset Correlation	None	Tickers=(empty) Start Date=too early (LB-1) End Date=future (UB+1) Correlation Basis=Annual	Error: Multiple validation errors (Invalid + boundaries)	TK-I1, SD-I4, ED-I4, CB-V3	Ticker LB-1, Start Date LB-1, End Date UB+1
TC-AC04	Asset Correlation	None	Tickers=INVALID123, many (>10) Start Date=future (UB+1) End Date=before Start Date (LB-1) Correlation Basis=Monthly Rolling=60	Error: Multiple (invalid ticker, boundaries)	TK-I2, TK-V3, SD-I3, ED-I3, CB-V2, RM-V3	Ticker UB, Start Date UB+1, End Date LB-1, Rolling UB
TC-AC05	Asset Correlation	None	Tickers=valid+invalid mix, with special chars Start Date=valid recent End Date=valid recent Correlation Basis=Daily Rolling=120	Error: invalid ticker and special chars	TK-I3, TK-I4, SD-V3, ED-V3, CB-V1, RT-V3	Ticker BVA (combo), Rolling UB
TC-AC06	Asset Correlation	None	Tickers=vti vnq gld bnd (lowercase) Start Date=wrong format End Date=wrong format Correlation Basis=Monthly Rolling=12	Error: format errors merged with auto-uppercase	TK-V5, SD-I1, ED-I1, CB-V2, RM-V2, TK-V4, SD-V3, ED-V2, CB-V2, RM-V1	Format boundaries, Rolling Months LB

TC-AC07	Asset Correlation	None	Tickers=valid Start Date=invalid date End Date=invalid date Correlation Basis=Monthly Rolling=36	Error: non-existent date errors	SD-I2, ED-I2	Non-existent boundaries
TC-FS01	Fund Screener	None	Fund Type=All Asset Class=All Benchmark=All Performance=All Expense=All	Success; unfiltered fund list	FT-V1, AC-V1, BM-V1, PH-V1, ER-V1	Nominal
TC-FS02	Fund Screener	None	Fund Type=ETF Asset Class=U.S. Equity Benchmark=S&P 500 TR Performance=3+ years Expense=<0.25%	Filtered ETF, equity, benchmark	FT-V2, AC-V2, BM-V2, PH-V2, ER-V2	Nominal
TC-FS03	Fund Screener	None	Fund Type=Mutual Fund Asset Class=Taxable Bond Benchmark=Russel 1000 TR USD Performance=5+ years Expense=<0.50%	Bond mutual funds	FT-V3, AC-V4, BM-V3, PH-V3, ER-V3	Nominal

TC-FS04	Fund Screener	None	Fund Type=Closed-End Fund Asset Class=International Equity Benchmark=MSCI ACWI Ex USA Performance=10+ years Expense=<0.75%	International closed-end	FT-V4, AC-V3, BM-V4, PH-V4, ER-V4	Nominal
TC-FS05	Fund Screener	None	Fund Type=ETF Asset Class=Municipal Bond Benchmark=Commodity Performance=15+ years Expense=<1.00%	Muni bond + commodity benchmark	FT-V2, AC-V5, BM-V5, PH-V5, ER-V5	Nominal
TC-FS06	Fund Screener	None	Fund Type=Mutual Fund Asset Class=Sector Equity, Allocation, Alternative Performance=20+ years Expense=All	Covers 3 asset classes at once	FT-V3, AC-V6, AC-V7, AC-V8, PH-V6, ER-V1	Nominal
TC-FS07	Fund Screener	None	Fund Type=Closed-End Fund Asset Class=Commodities, Miscellaneous, Nontraditional Equity Performance=25+ years Expense=<0.50%	Covers final 3 asset classes	FT-V4, AC-V9, AC-V10, AC-V11, PH-V7, ER-V3	Nominal

TC-MP01	Manager Performance Analysis	None	Ticker=FLPSX, Benchmark=VOE, RiskFactor=Fama-French US, Regression=LASSO+OLS, RegimePerformance=No, StartDate=01/01/2015, EndDate=12/31/2021, Periodicity=Monthly, Rolling=36	Success	TK-V1,BM-V1,RM-V3,RG-V1,RP-V1,SD-V1,ED-V1,PC-V1,RP-V1	Nominal/valid only
TC-MP02	Manager Performance Analysis	None	Ticker=, Benchmark=(blank), RiskFactor=None, Regression=None, RegimePerformance=Yes, RegimeType=Market Volatility, RegimeAnalysis=By Period, StartDate=INVALID, EndDate=INVALID, Periodicity=Quarterly, Rolling=3	Error: blank/invalid ticker and bad dates	TK-I1,BM-I1,RM-V1,RG-V1,RP-V2,RT-V1,RA-V2,SD-I1,ED-I1,PC-V2,RP-V1	Ticker:invalid, Benchmark:invalid, Start/End:invalid,LB, Rolling:LB
TC-MP03	Manager Performance Analysis	None	Ticker=FLPSX, Benchmark=VOE, RiskFactor=SRL Analytics, Regression=LASSO+OLS, RegimePerformance=Yes, RegimeType=Market Volatility, RegimeAnalysis=In Aggregate, StartDate=01/01/2035, EndDate=future,	Error: Start/End date future	TK-V1,BM-V1,RM-V2,RG-V1,RP-V2,RT-V1,RA-V1,SD-I1,ED-I1,PC-V1,RP-V1	Start/End:UB, Rolling:UB

			Periodicity=Monthly, Rolling=60			
TC-MP04	Manager Performance Analysis	None	Ticker=FLPSX, Benchmark=VOE, RiskFactor=Fama-French Intl, Regression=LASSO+OLS, RegimePerformance=Yes, RegimeType=Market Volatility, RegimeAnalysis=By Period, StartDate=01/26/2025, EndDate=01/01/1900, Periodicity=Quarterly, Rolling=3	Error enddate<startdate	TK-V1,BM-V1,RM-V4, RG-V1,RP-V2,RT-V1, RA-V2,SD-IV1,ED-iV1, PC-V2,RP-V1	Rolling:LB, EndDate:LB, Start:UB
TC-PO01	Portfolio Optimization	None	Portfolio Type=Tickers, Time Period=Year-to-Year, Start Year=2000, End Year=2020, Optimization Goal=Maximize Sharpe Ratio, Robust Opt=No, Hist Returns=Yes, Hist Vol=Yes, Hist Corr=Yes, Asset Const=Yes, Group Const=No, Compared Alloc=None, Benchmark=None, Assets: VTSMX(60%), VBMFX(40%), Min=0%, Max=100%,	Valid optimization result	PT-V1, TP-V1, SY-V1, EY-V1, OG-V1, RO-V1, HR-V1, HV-V1, HC-V1, AC-V1, GC-V1, CA-V1, BM-V1, AS-V1, AL-V1, MW-V1, XW-V1, ER-V1, VOL-V1	Start/End: Nominal; Alloc: Nominal/UB; Min/Max Weight: LB/UB; ER/Vol: Nominal

			Exp Ret=8.0%, Vol=15.0%			
TC-PO02	Portfolio Optimization	None	Portfolio Type=Tickers, Time Period=Month-to-Month, Start Year=1985 (LB), End Year=2025 (UB), Goal=Minimize Volatility, Robust Opt=Yes, Hist Returns=No, Hist Vol=No, Hist Corr=No, Asset Const=No, Group Const=Yes, Compared Alloc=Equal Weighted, Benchmark=Specify, BM Ticker=VFINX, Assets: VTSMX(0%), VGTSX(100%), Min=0% (LB), Max=100% (UB), Exp Ret=0.1% (LB), Vol=0.1% (LB)	Valid, all toggles and boundaries	PT-V2, TP-V2, SY-V1, EY-V1, OG-V2, RO-V2, HR-V2, HV-V2, HC-V2, AC-V2, GC-V2, CA-V2, BM-V2, BMT-V1, AS-V1, AL-V1, MW-V1, XW-V1, ER-V1, VOL-V1, AL-V1, MW-V1, XW-V1	Start: LB, End: UB, Min/Max Weight: LB/UB, ER/Vol: LB, Alloc: LB/UB MW/XW: UB
TC-PO03	Portfolio Optimization	None	For each test, select remaining Optim Goals (OG-V3...OG-V13), Compared Allocations (CA-V3 to CA-V5), BM Import, Predefined; valid values elsewhere	Success for all remaining valids	OG-V3 to OG-V13, CA-V3 to CA-V5, BM-V3, BM-V4	Nominal (no boundaries)

TC-PO04	Portfolio Optimization	None	Start=2025 UB, End=1985, Assets: "INVALID" (AS-I1), "" (AS-I2), Allocations: -1%, 101%; Min=60%, Max=50%	Error for invalid dates & symbols, allocation/weight invalids	SY-I1, SY-I2, EY-I1, EY-I2, AS-I1, AS-I2, AL-I1, AL-I2, AL-I3, MW-I1, MW-I2	Start: UB, End: LB Alloc: LB-1/UB+1, Min Weight: LB-1, Max Weight: UB+1
TC-PO05	Portfolio Optimization	None	Exp Ret: -5.0% (ER-I1), 200.0% (ER-I2), blank (""); Vol: -10.0% (VOL-I1), 500.0% (VOL-I2), blank	Error for invalid ER/Vol	ER-I1, ER-I2, VOL-I1, VOL-I2	ER: LB-1/UB+1, VOL: LB-1/UB+1
TC-PO06	Portfolio Optimization	None	All inputs at upper boundary: ER=50.0% (UB), Vol=100.0% (UB), Target Ret=50.0% (UB), Target Vol=100.0% (UB), TTE=50.0% (UB), CVaR=50.0% (UB)	Accepted, no errors	-	ER/Vol/Targets/TE/CVaR: UB
TC-PO07	Portfolio Optimization	None	All inputs at lower boundary: ER=0.1% (LB), Vol=0.1% (LB), Target Ret=0.1% (LB), Target Vol=0.1% (LB), TTE=0.1% (LB), CVaR=0.1% (LB)	Accepted, no errors	-	ER/Vol/Targets/TE/CVaR: LB

TC-MCS01	Monte Carlo Simulation	None	Portfolio Type=Tickers, Initial Amount=1,000,000, Cashflows=Withdraw fixed, Withdrawal Amount=45,000 (Nominal), Inflation Adjusted=Yes, Withdrawal Frequency=Annually, Simulation Period=30, Tax Treatment=Pre-tax, Simulation Model=Historical Returns, Use Full History=Yes, Bootstrap Model=Single Year, Sequence Risk=No Adjustments, Inflation Model=Historical, Rebalancing=Annually, Intervals=Defaults, Fee Structure=None, Asset Ticker="VTI"/"BND", Asset Alloc 60%, 40%	Simulation runs successfully	All mainstream Valid classes	Nominal for all fields, Alloc UB
TC-MCS02	Monte Carlo Simulation	None	Portfolio Type=Asset Classes, Initial Amount=10,000,000 (UB), Withdrawal Amount=1,000,000 (UB), Current Age=75 (UB), Simulation Period=75 (UB), Risk-Free Rate=50.0% (UB), Expected Return=50.0% (UB), Volatility=100.0%	Accepts upper boundaries	PT-V1, IA-V1, WA-V1, CA-V1, SP-V1, RFR-V1, ER-V1, VOL-V1, INFMEAN-V1, INFVOL-V1, AA-V1	UB on each field listed

			(UB), Inflation Mean=99.9% (UB), Inflation Volatility=100% (UB), Asset Allocation=100% (UB)			
TC-MCS03	Monte Carlo Simulation	None	Initial Amount=1 (LB), Withdrawal Amount=1 (LB), Current Age=30 (LB), Simulation Period=5 (LB), Tax Treatment=After-tax, Federal/Capital Gains/Dividend/ACA/ State Income Tax=0% (LB), Risk-Free Rate=0.1% (LB), Asset Allocation=0% (LB)	Doesnt accept allocation lower boundaries	IA-V1, WA-V1, WP-V1, CA-V1, SP-V1, TT-V1, FIT-V1, CGT-V1, DT-V1, ACAT-V1, SIT-V1, RFR-V1, AA-V1	LB on each field listed
TC-MCS04	Monte Carlo Simulation	None	Simulation Model=Statistical, Time Series Model=Normal, Risk-Free Rate=3.9, Use Historical Volatility=No, Use Historical Correlations=No, Correlation Matrix=Upload, Distribution=Fat-Taile d, Degrees of Freedom=30, Cashflows=Import, Cashflows Amounts=Upload	File options and statistical, upload paths	SM-V1, TS-V1, RFR-V1, UHV-V1, UHC-V1, DIST-V1, DOF-V1, CF-V1	Nominal; file upload; dropdown dynamics

TC-MCS05	Monte Carlo Simulation	None	Simulation Model=Parameterized, Expected Return=7.0 (Nominal), Volatility=12.0 (Nominal), Inflation Model=Parameterized, Inflation Mean=4.0 (Nominal), Inflation Vol=3.0 (Nominal), Intervals=Custom, Percentile Intervals="10,25,50,75,90", Return Intervals="0,2.5,5,7.5,10,12.5", Bootstrap=Block, Block Min=1 (LB), Block Max=20 (Nominal), Circular Bootstrapping=Yes	Parameterized/ dynamic case	SM-V1, ER-V1, VOL-V1, INFM-V1, INFMEAN-V1, INFVOL-V1, INT-V1, PI-V1, RI-V1, BM-V1, BMIN-V1, BMAX-V1, CB-V1	Block Min LB, Block Max Nominal, dynamic coverage
TC-MCS06	Monte Carlo Simulation	None	Initial Amount=0 (IA-I1), Withdrawal Amount=Invalid(WA-I1), Withdrawal Percentage=0 (WP-I1), Current Age=25 (CA-I1), Simulation Period=4 (SP-I1), Federal/Capital Gains/Dividend/ACA/State Tax=-1/-5/-2/-1/-3 (various I1s), Risk-Free Rate=0 (RFR-I1), Start Year=1972 (LB), End Year=2024(UB), Block Min=0 (BMIN-I1), Block	Expect validation errors	All Invalid I1/I2 classes as above	For each: LB-1 or out-of-range (see inputs/fields)

			Max=0 (BMAX-I1), Expected Return=0 (ER-I1), Volatility=0 (VOL-I1), Inf Mean/Vol=-1 (INFMEAN-I1/INFVOL-I1), Asset="INVALID" (AT-I1), Asset Alloc=-10% (AA-I1)			
TC-MCS07	Monte Carlo Simulation	None	Initial Amount=10,000,001 (UB+1), Withdrawal Amount=1,000,001 (UB+1), Withdrawal Perc=100.1% (UB+1), Federal Income Tax=101%, Risk-Free Rate=50.1%, Exp Return=50.1%, Volatility=100.1%,	Expect error/field rejection	Each field UB+1 from boundary table	UB+1 for all listed quantities
TC-MCS08	Monte Carlo Simulation	None	Cashflows = all remaining: Withdraw % (WP), Rolling Avg, Geometric, Life Exp; test Rolling=3, Smoothing=75%, Life Exp=Single, Current Age=70 (Nominal), Sequence Risk=Worst-5, add interval/percentile/return custom settings	All cashflow switches, interval types	CF-V1, WP-V1, RA-V1, SR-V1, LE-V1, CA-V1, SOR-V1, INT-V1, PI-V1, RI-V1	Nominal, covers all dropdown and dynamic triggers

TC-TAA01	Tactical Asset Allocation	None	TACTICALModel: 3, timePeriod: YEAR TO YEAR, startYear: 1985, endYear: 2025, initialAmount: 10000, symbol: "SPY", movingAverageSignal: 1, movingAverageType: 1, tradeExecution: 1,	Success, default scenario	TM-V1, TP-V2, SY-V1, EY-V1, IA-V1, TK-V2, BS-V1, MAT-V1, LP-V1, TF-V2, TE-V1	Nominal (all key fields)
TC-TAA02	Tactical Asset Allocation	None	TACTICALModel: 5, timePeriod: YEAR TO YEAR, startYear: 2000, endYear: 2020, initialAmount: 50000, periodicAdjustment: 1, adjustmentAmount: 500, inflationAdjusted: true, symbols: "SPY, BND, GLD", assetsToHold: 3, allocationWeights: 4, stopLossMode: 2, stopLossThreshold: 5.0, movingAverageSignal: 2, movingAverageType: 2, windowSize: -1, windowSizeInDays: 63, windowSize2: 12, rebalancePeriod: 3	Complex scenario accepted	TM-V4, IA-V2, CF-V2, CA-V1, TK-V3, AH-V2, AW-V3, SL-V3, SLT-V2, BS-V2, MAT-V2, LP-V3, LPD-V1, TF-V3	Mix: Nominal, custom, valid edge-cases

TC-TAA03	Tactical Asset Allocation	None	TACTICALModel: 1, initialAmount: 0, symbol: "", withdrawalPercentage: 101.1, windowSizeInDays: 0, leverageRatio: -25.0, allocation1_1: -10.0, allocation2_1: 90.0, timingWeight1: 101, stopLossThreshold: 0.0, debtAmount: -5000	Proper error/validation	TM-I1, IA-I1, TK-I2, WP-I3, LPD-I1, LR-I1, PA-I3, PA-I2, UB+1 on weights, SLT-I1, DA-I2	LB−1, UB+1, invalids across fields
TC-TAA04	Tactical Asset Allocation	None	TACTICALModel: 7, initialAmount: 25000, volatilityTarget: 9.0, leverageType: 1, leverageRatio: 50.0, debtInterest: 5.0, maintenanceMargin: 25.0, stopLossMode: 1, stopLossThreshold: 2.0, riskControlType: 1, riskWindowSize: 10, maxDeriskPercentage: 100, deriskIncrement: 25, reriskIncrement: 25, threshold1: 2.0, riskChange1: 100	Advanced features accepted	TM-V7, LR-V1, DI-V2, MM-V1, SL-V2, SLT-V1; and nominal risk controls	Nominal for risk/leverage fields

TC-TAA05	Tactical Asset Allocation	None	TACTICALModel: 2, timePeriod: month to month, startYear: 1990, endYear: 2015, firstMonth: 6, lastMonth: 6, initialAmount: 1, separateSignalAsset: true, signalAsset: "VIX", expression: "price > ma(20) and rsi(14) < 70", performancePeriods: true, periodWeighting: 2, timingPeriod1: 5, timingWeight1: 100, excludePreviousMonth: true, normalizeReturns: true	Custom/alternate features	TM-V2, TP-V1, FM-V2, IA-V3, custom expression/fields, boundaries at lower end	LB on major numeric fields, custom
TC-TAA06	Tactical Asset Allocation	None	initialAmount: 1, contributionAmount: 1, withdrawalPercentage: 0.1, volatilityTarget: 0.1, windowSizeInDays: 1, stopLossThreshold: 0.1, leverageRatio: 0.1, debtInterest: 0.1, allocation1_1: 0.1, timingWeight1: 0, riskChange1: 0, maxDeriskPercentage: 0	Min/lower values allowed	All LB boundary valid ECPs (incl. zero-valid where allowed)	LB and special zero cases

TC-TAA07	Tactical Asset Allocation	None	initialAmount: 999999999, contributionAmount: 999999999, withdrawalPercentage: 100.0, volatilityTarget: 50.0, windowSizeInDays: 500, stopLossThreshold: 25.0, leverageRatio: 100.0, debtInterest: 25.0, allocation1_1: 100.0, timingWeight1: 100, riskChange1: 100, maxDeriskPercentage: 100	Maximum/upper values allowed	All UB boundary valid ECPs	UB/practical max on all numerics

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CONFIG FORMS

TC ID	Tools/URL	Preconditions	Inputs (Key Fields Only)	Expected Outcome	Classes Hit	Boundaries Hit
TC-ABF01	Asset Backfill Configuration	None	Backfill Oldest Share Class=No Asset Ticker 1=AAPL Backfill Ticker 1=AAPLX All others=Default	Success, minimal valid selection	BOSC-V1, AT-V1, BT-V1, AT-V2, BT-V3	LB (1 pair, 1 backfill)

TC-ABF02	Asset Backfill Configuration	None	Backfill Oldest Share Class=Yes Asset Ticker 1-10=All valid, distinct Backfill Ticker 1-10=Some same, some diff	Success, all maximum pairs, variations	BOSC-V2, AT-V1, BT-V1, BT-V2	UB (10 pairs, 10 backfill)
TC-ABF03	Asset Backfill Configuration	None	Backfill Oldest Share Class=Yes Asset Ticker 1=BADTICKER Backfill Ticker 1=BADBACKFILL Asset Ticker 2=SPY Backfill Ticker 2=MSFT	Validation error for invalid/mismatch	AT-I1, BT-I1, BT-I2, AT-V1, BT-V1	LB (2 pairs, some invalid)
TC-ABF04	Asset Backfill Configuration	None	Backfill Oldest Share Class=LONG ASSETS, EMPTY BACKFILL	Accepts, no selections (blank config)	BOSC-V1, AT-V2, BT-V3	UB+1 LB−1 (0 pairs, 0 backfill)
TC-MF01	Manage Fees Form	Any	Name="Management Fee", Type=2, Annual Percentage=1.0, Payment Schedule=ANNUALLY	Save Success	N-V1, T-V1, AP-V1, PS-V3	Nominal
TC-MF02	Manage Fees Form	Any	Name="Tiered Mgmt", Type=3, Successive Tiers="No", Tier Assets: 250K/500K/1M Asc, Tier %: 1/0.9/0.75, Payment Schedule=3	Save Success: 3 ascending tiers	N-V1, T-V3, TA-V1, PS-V2	Nominal/Mid/ Boundaries in tiers

TC-MF03	Manage Fees Form	Any	Name="Perf Fee", Type=5, Incentive Fee=20.0, Use Hurdle Rate=Yes, Fixed Hurdle Rate=Yes, Hurdle Rate=5.0, Use High-water Mark=Yes, Payment Schedule=ANNUAL	Save Success: Performance, hurdle, high-water	T-V5, IF-V1, HR-V1, PS-V3	Nominal for incentives/hurdle
TC-MF04	Manage Fees Form	Any	Name="", Type=Tiered amount, Annual % = 0.0 (AP-I1), Tier 1 Amount=500K, Tier 2 Amount=250K (TA-I1), Incentive Fee=101.0 (IF-I2)	Save Fails: Name blank, percent 0, tiers bad	N-I1, AP-I1, TA-I1, IF-I2	LB−1, UB+1, multiple invalid
TC-MF05	Manage Fees Form	Any	Name="Fixed Amt", Type=1, Annual Minimum=2000, Inflation Adj=No, Annual Increase=2.5, Payment Schedule=2	Save Success: Valid inflation fixed amt	T-V2, AM-V1, PS-V1	Nominal
TC-MF06	Manage Fees Form	Any	Name="F", Type=tiered perc,, Tier 1 Amount=1, Tier 1 Percentage=0.01 (LB), Payment Schedule=2	Save Success: All minimums	Boundary LB for all below	All LB
TC-MF07	Manage Fees Form	Any	Name=100 Chars, Type=performance, Annual Percentage=101.0, Incentive Fee=101.0, Hurdle Rate=51.0,	Error multiple	Boundary UB + 1 for all	All UB + 1

TC-ME01	Market Expectations Form	None	Row 1: Type=1, Asset=LargeCapBlend, Return=8, Vol=15 Row 2: Type=1, Asset=TotalBond, Return=4, Vol=5 Row 3: Type=1, Asset=REIT, Return=2, Vol=25 Row 4-5: Blank	Standard save, all nominal	TYP-V1, AC-V1/3/4, RET-V1, VOL-V2/3, ROW-V1	Nominal
TC-ME02	Market Expectations Form	None	**Row 1:** Type=2, Ticker=AAPL, Return=12, Vol=20 **Row 2:** Type=2, Ticker="A" (LB), Return=0, Vol=0.1 (LB) **Row 3:** Type=2, Ticker=VERYLONGTK (UB+1), Return=100.0 (UB), Vol=100.0 (UB) **Row 4**: Type=1, Asset="EmergingMarket", Return=-100.0 (LB), Vol=25.0 **Row 5:** Type=1, Asset="TotalBond", Return=101.0 (UB+1), Vol=0.0 (LB-1) **Row 6:** Type=1, Asset="", Return=-101.0 (LB-1), Vol=-5.0 (LB-1) **Row 7** empty ticker **Row 8** invalid returns and volatility	Error for UB+1 ticker; negatives and UBs handled Error for LB-1 and UB+1; valid return/negatives accepted Bulk/UB stress save, all invalid/edge cases exercised	TYP-V2, TIK-V1/TIK-I2/3, RET-V3/4, VOL-V1/3/ VOL-I3, ROW-V2/ROW-I1 AC-V2/AC-I1, RET-V2/RET-I1/2, VOL-V2/VOL-I1/2, ROW-I1	All ticker/return/vol bounds. LB, LB-1, UB+1, negatives UB for rows/fields

TC-MR01	Manage Reports Form	NONE	Company Name="Portfolio Visualizer", Include Logo=Yes, Footer Text="www.portfoliovisualizer.com",Footer Link="https://www.portfoliovisualizer.com", Use Cover Page=No, Include Page Numbers=Yes, Include Report Date=Yes, Custom Disclosures=0, Disclosures="", Report Font="Roboto", Chart Colors="Palette 1"	Success (all defaults)	CN-V1, IL-V1, PFT-V1, PFL-V1, UCP-V2, Toggle-V1, CD-V1, DISC-V2, RF-V1, CC-V1	Nominal/default values
TC-MR02	Manage Reports Form	NONE	Company Name="My Investment Firm", Include Logo=Yes + Logo Image=company_logo.png, Use Cover Page=Yes + Cover Page PDF=cover_design.pdf, Custom Disclosures=1, Disclosures="This report is for informational purposes.", Report Font="Lato", Chart Colors="Custom", Color List="#FF0000 #00FF00 #0000FF", All Color Pickers=Custom colors	Success (custom branding + files)	CN-V1, IL-V1, LI-V1, UCP-V1, CP-V1, CD-V2, DISC-V1, RF-V2, CC-V2, CL-V1, CPick-V2	File uploads, custom configs

TC-MR03	Manage Reports Form	NONE	Company Name="" (CN-I1) LB-1, Company Name=65-char (CN-I2), Logo Image=document.png), Footer Link="not-a-url" (PFL-I1), Custom Disclosures=3 (CD-I1), Chart Colors="Custom", Color List="#ZZZ #12345" (CL-I1), Report Title Background="red" (CPick-I1)	Validation errors for invalids	CN-I1, CN-I2, LI-I1, PFL-I1, CD-I1, CL-I1, CPick-I1	Empty/max length/invalid formats
TC-MR04	Manage Reports Form	NONE	Company Name="LONG" (UB), Include Logo=No, Footer Text="" (empty), Footer Link="" (empty), Use Cover Page=No, Include Page Numbers=No, Include Report Date=No, Disclosures=5000-char text (UB), Chart Colors="Custom", Color List=500-char hex list (UB), All Color Pickers=Various custom colors	(min/max boundaries)	CN-V1(LB), IL-V2, PFT-V2, PFL-V2, UCP-V2, Toggle-V2, DISC-V3(UB), CC-V2, CL-V1(UB), CPick-V2	UB (company name), UB+1(text fields) LB FOOTER
TC-REG01	Market Regime Form	NONE	Name="Volatility Regime", Desc="VIX-based", Data Source="Existing",	All nominal, partial regime config	N-V1, DESC-V1, RDS-V1, TS-V1, ST-V1,	Nominal, required combos

			Time Series="VTSIX", Series Type="Monthly Index", Defs="Value Breakdown", Smoothing=0, DefaultType="Normal Market", Regime Levels: >=20 "High", >=15 "Elevated"		RD-V1, SF-V1, DRT-V1, CT-V1, TH-V1, RL-V1, RSO-V1	
TC-REG02	Market Regime Form	NONE	Name="Quintile Regime", Data Source="Existing", Time Series="SPY", Series Type="Monthly Returns", Defs="Quintile", Smoothing=6, DefaultType="Middle Quintile",	Smoothing/quantile logic, alternative type	N-V1, RDS-V1, TS-V2, ST-V2, RD-V4, SF-V2, DRT-V1, RSO-V3	Moderate smoothing, quantile/alt-sort
TC-REG03	Market Regime Form	NONE	Name="Custom Import", Data Source="Imported File", File="regimes.csv", Defs="Dislocation", DislocationPeriod=3, Dir="Up", Smoothing=3, DefaultType="Stable", SortOrder="Alpha"	File import, dislocation config	N-V1, RDS-V2, RDF-V1, RD-V6, DP-V1, DD-V1, SF-V2, DRT-V1, RSO-V2	File import, dislocation
TC-REG04	Market Regime Form	NONE	Name=129-chars, Data Source="Existing", Time Series="", File="WRONG FILE.csv", Threshold=999999.9	Validation errors on all invalid/boundaries	N-I1/N-I2, TS-I1/TS-I2, RDF-I1, TH-I1, RL-I1, SF-I1	Errors/All edge/boundaries

			, Regime Level1: >=25.0 label="", Smoothing=12			
TC-REG05	Market Regime Form	NONE	Name="", Data Source="Existing", Time Series="INVALID", Series Type="Monthly Index", Defs="Value Breakdown", Smoothing=12, DefaultType="Neutral", Regime Levels: >=30 "Extreme", >=25 "VHigh", >=20 "High", >=15 "Elevated", SortOrder="Numerical"	All regime levels at max, smoothing max Error on time series	SF-V3, CT-V1, TH-V1, RL-V1, RSO-V3	Maximum config

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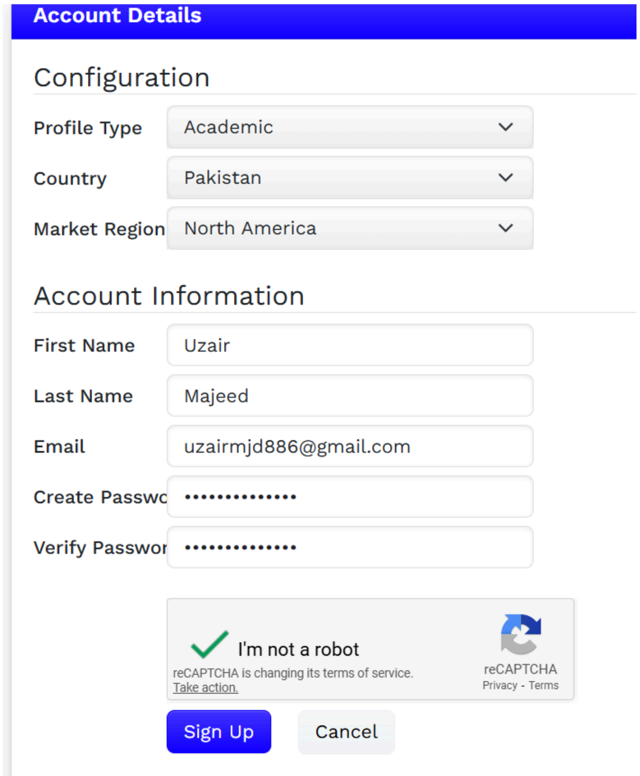
6. Execution Evidence

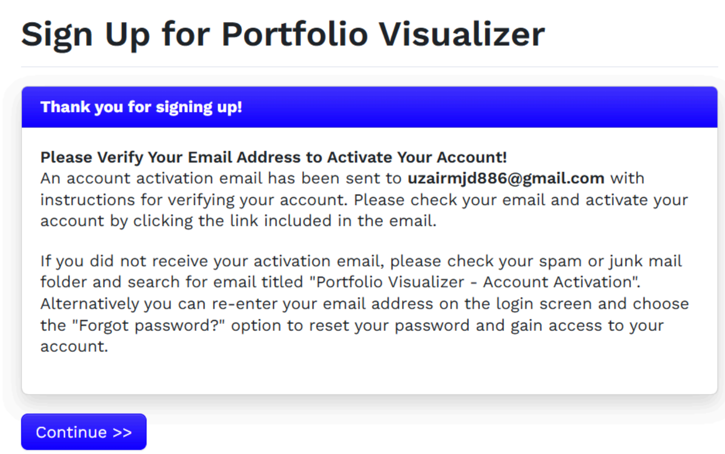
Provide screenshots for each test case:

1. **TC ID: TC-S01**

- **Form Filled (Input Screenshot):**



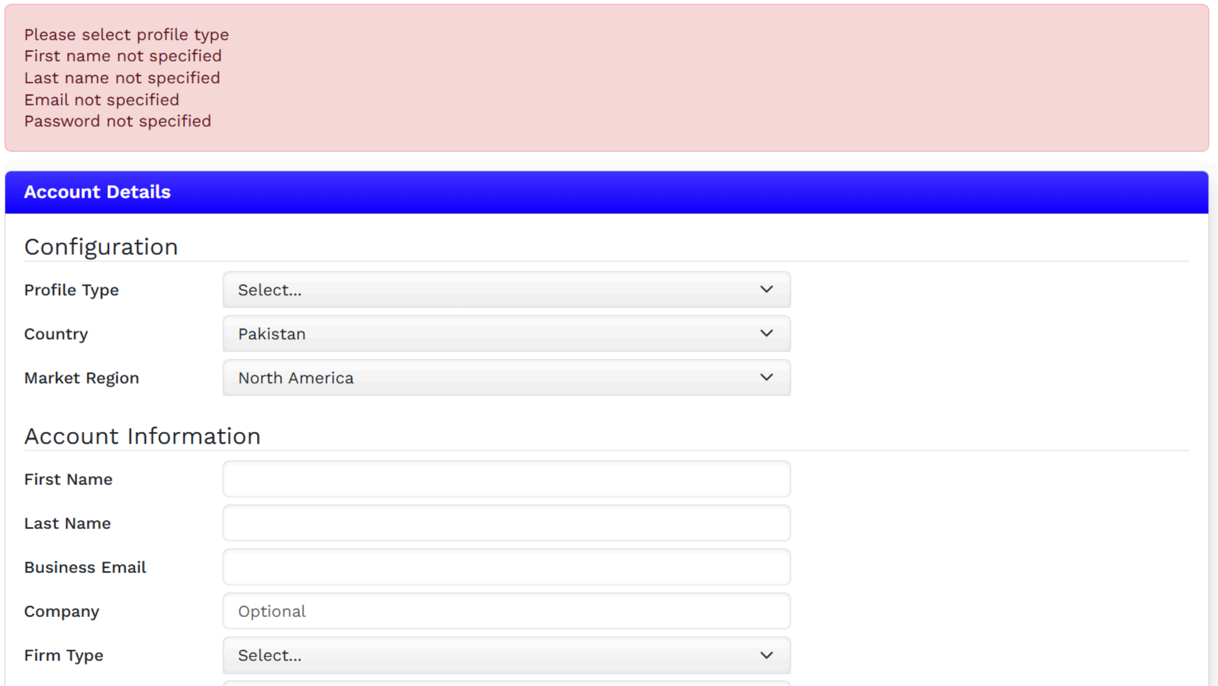
- **Result (Output Screenshot):**



- **Notes:Worked as expected**

11. TC ID: TC-S02

- **Form Filled (Input Screenshot):**

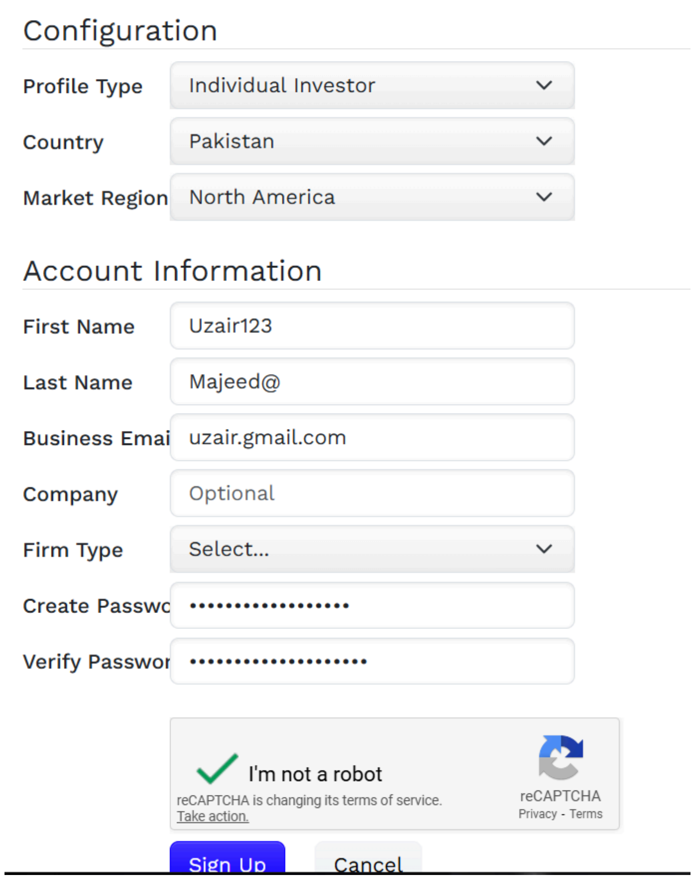


- **Result (Output Screenshot):**

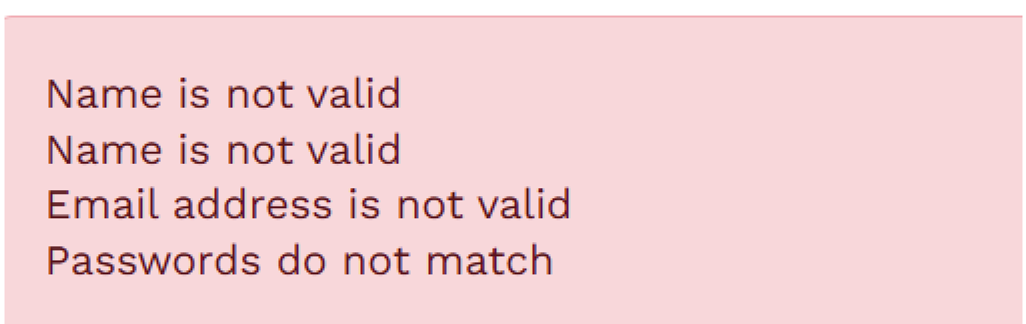
- **Notes:** Worked as expected

12. TC ID: TC-S03

- **Form Filled (Input Screenshot):**



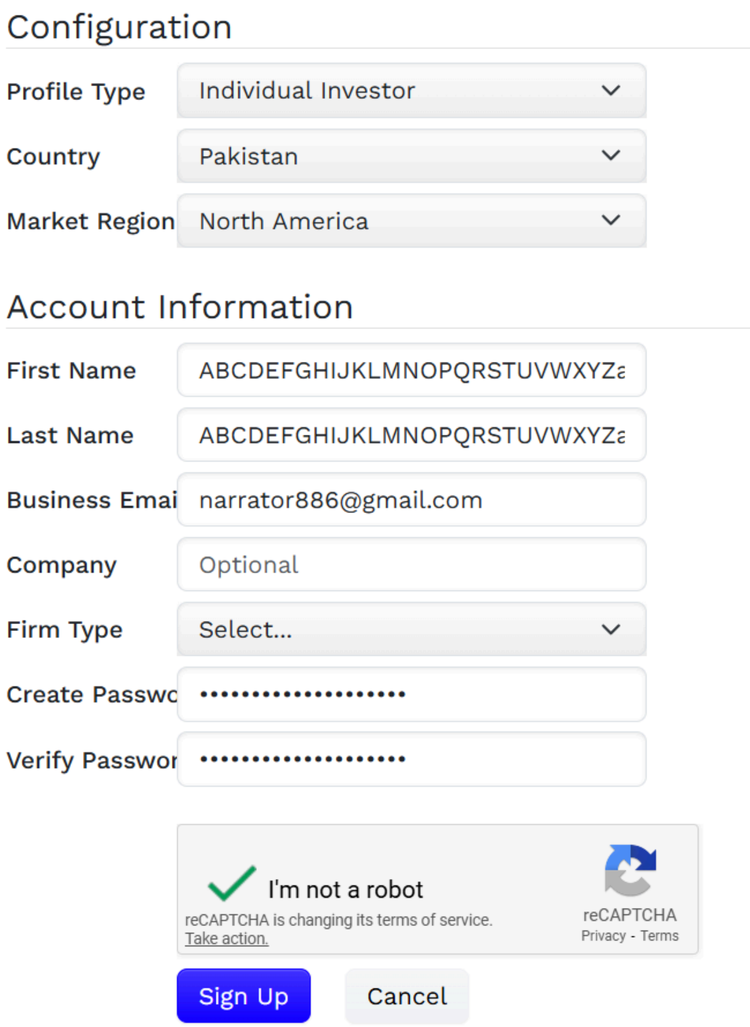
- **Result (Output Screenshot):**



- **Notes:** Worked as expected

13. **TC ID: TC-S04**

- **Form Filled (Input Screenshot):**



Configuration

Profile Type: Individual Investor

Country: Pakistan

Market Region: North America

Account Information

First Name: ABCDEFGHIJKLMNOPQRSTUVWXYZa

Last Name: ABCDEFGHIJKLMNOPQRSTUVWXYZa

Business Emai: narrator886@gmail.com

Company: Optional

Firm Type: Select...

Create Passwo: ••••••••••••••••••••

Verify Passwor: ••••••••••••••••••••

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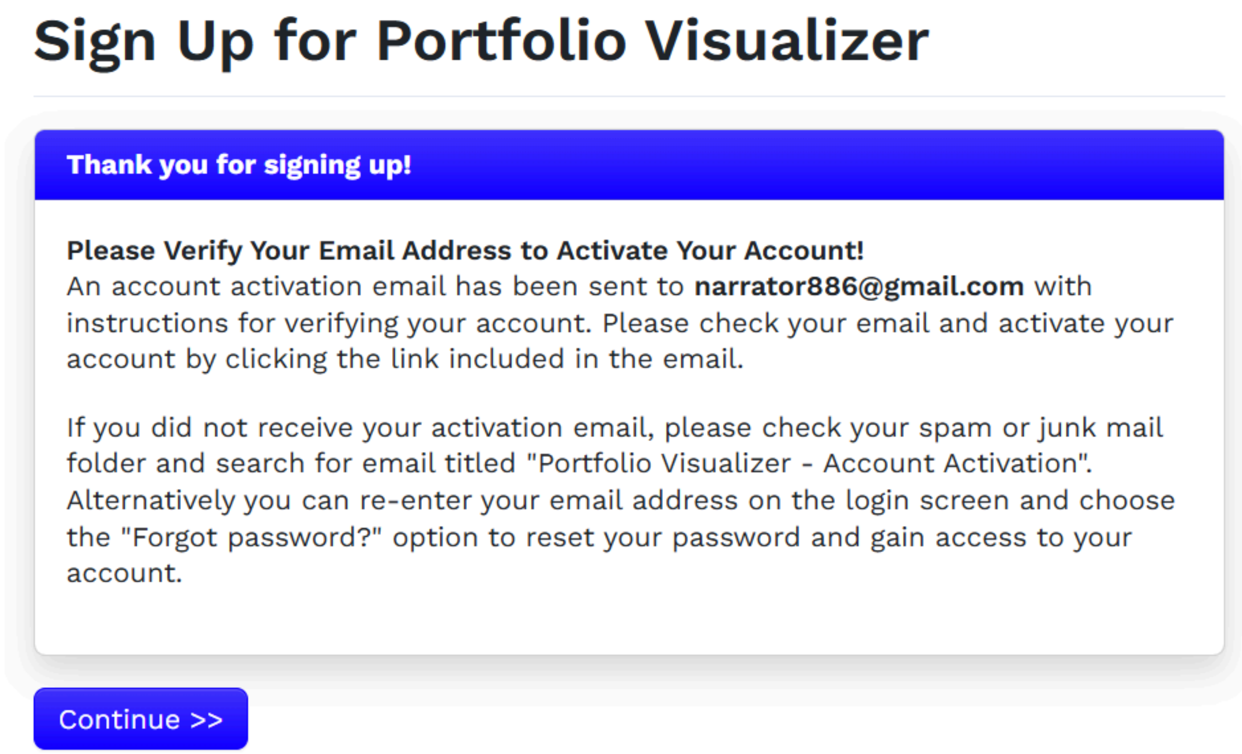
- **Result (Output Screenshot):**



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Thank you for signing up!

Please Verify Your Email Address to Activate Your Account!
An account activation email has been sent to **narrator886@gmail.com** with instructions for verifying your account. Please check your email and activate your account by clicking the link included in the email.

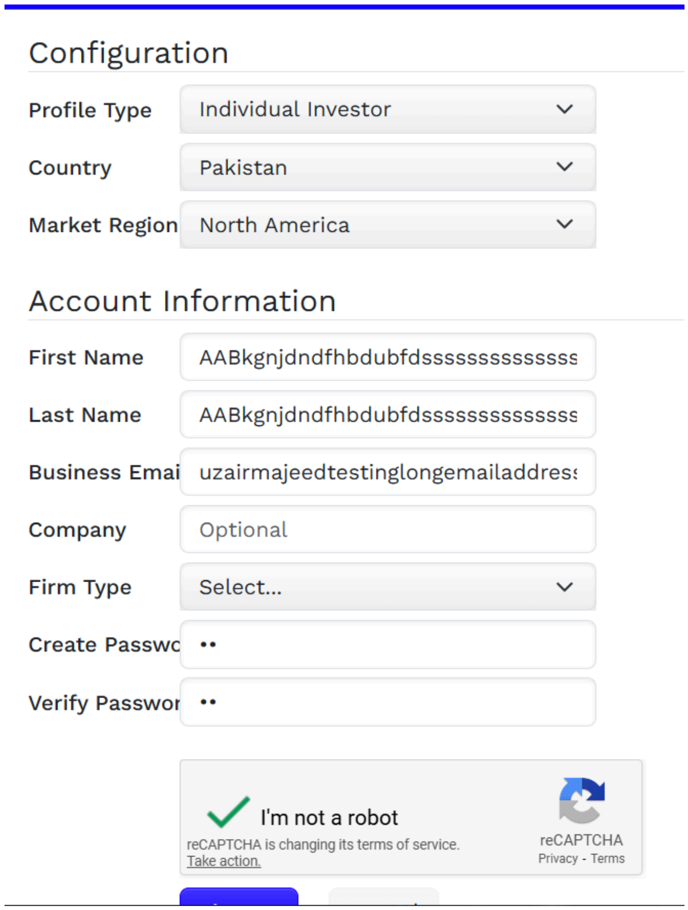
If you did not receive your activation email, please check your spam or junk mail folder and search for email titled "Portfolio Visualizer - Account Activation". Alternatively you can re-enter your email address on the login screen and choose the "Forgot password?" option to reset your password and gain access to your account.

Continue >>

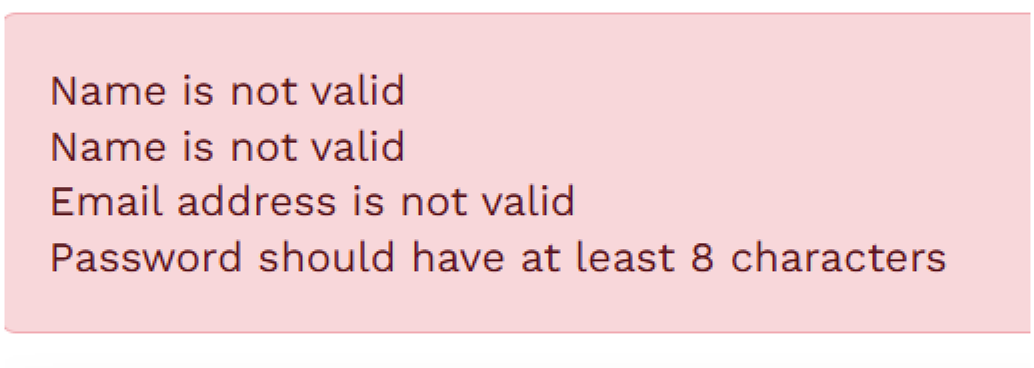
- **Notes: Worked as expected.**

14. **TC ID: TC-S05**

- **Form Filled (Input Screenshot):**



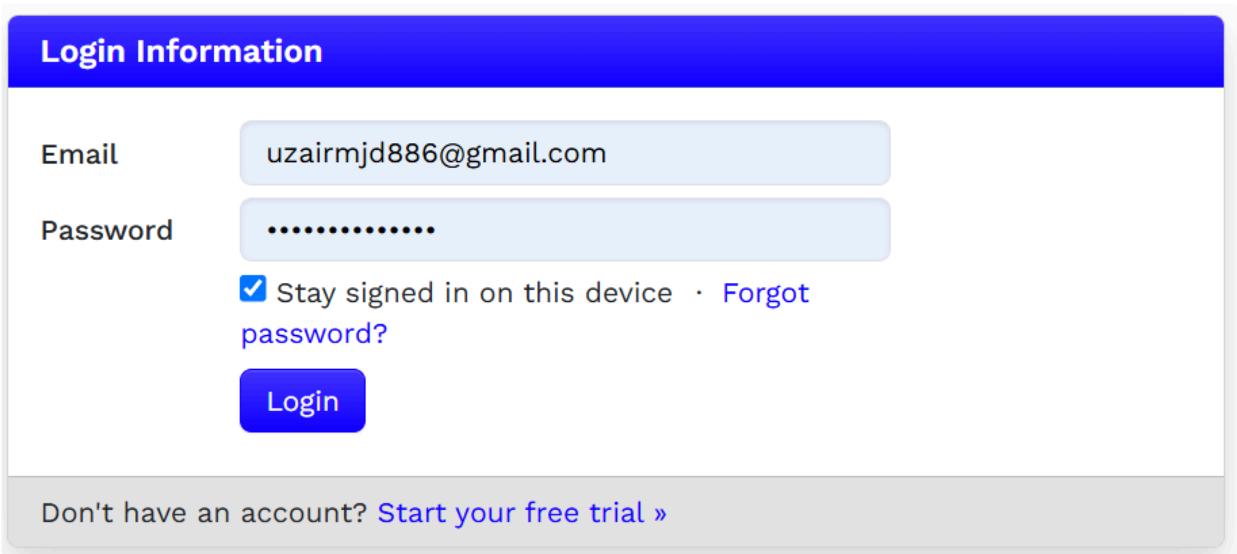
- **Result (Output Screenshot):**



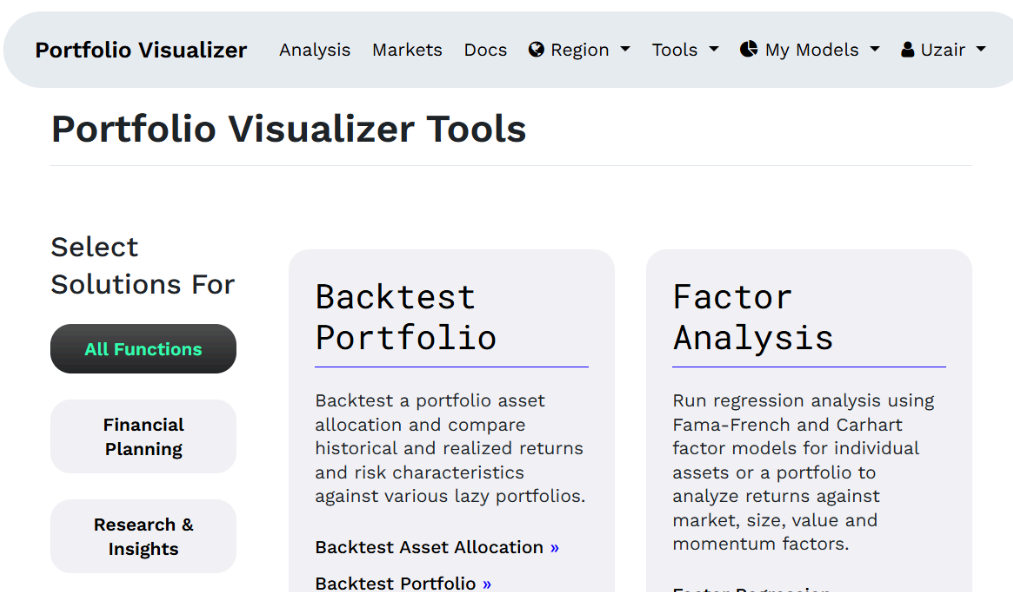
- **Notes:Worked as expected**

15. **TC ID: TC-L01**

- **Form Filled (Input Screenshot):**



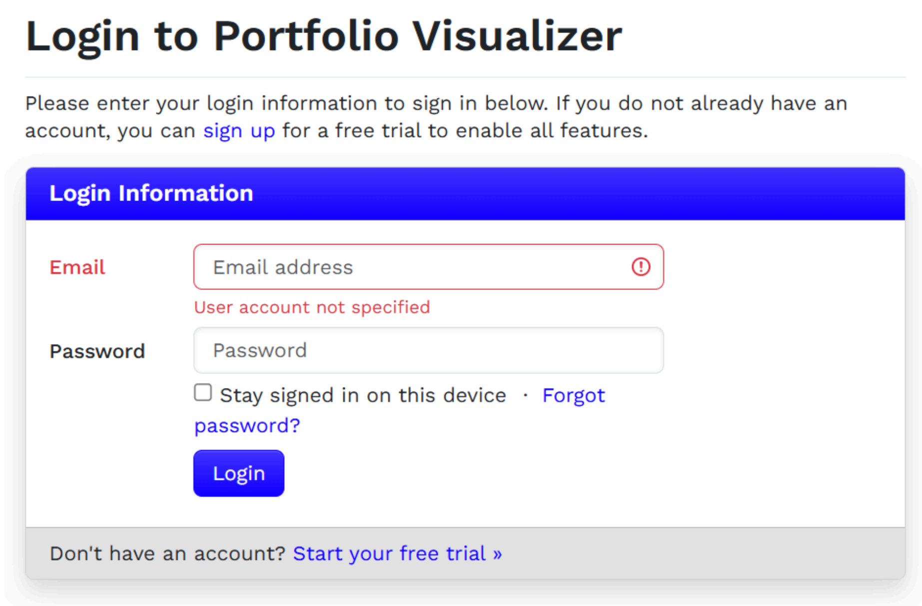
- **Result (Output Screenshot):**



- **Notes: Logged in successfully**

- **TC ID: TC-L02**

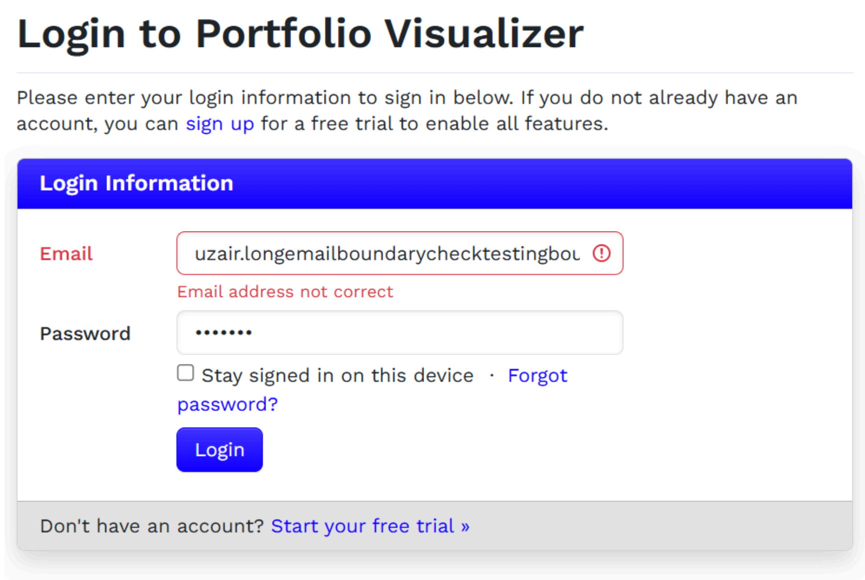
- **Form Filled (Input Screenshot):**



- **Notes: Worked as expected.**

- **TC ID: TC-L03**

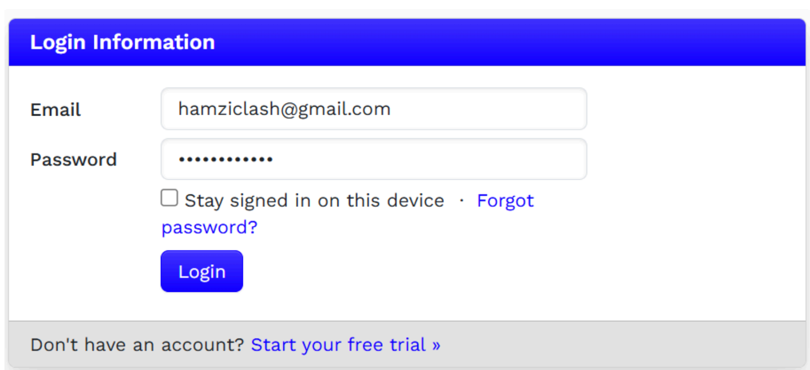
- **Form Filled (Input Screenshot):**



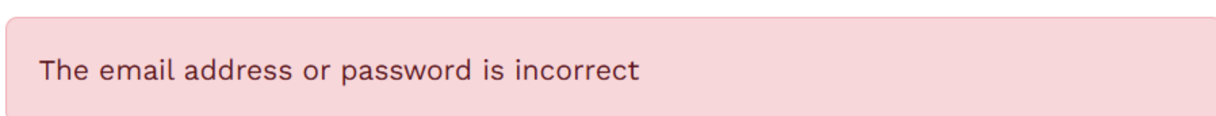
- **Notes: Worked as expected.**

- ## TC ID: TC-L04

- **Form Filled (Input Screenshot):**



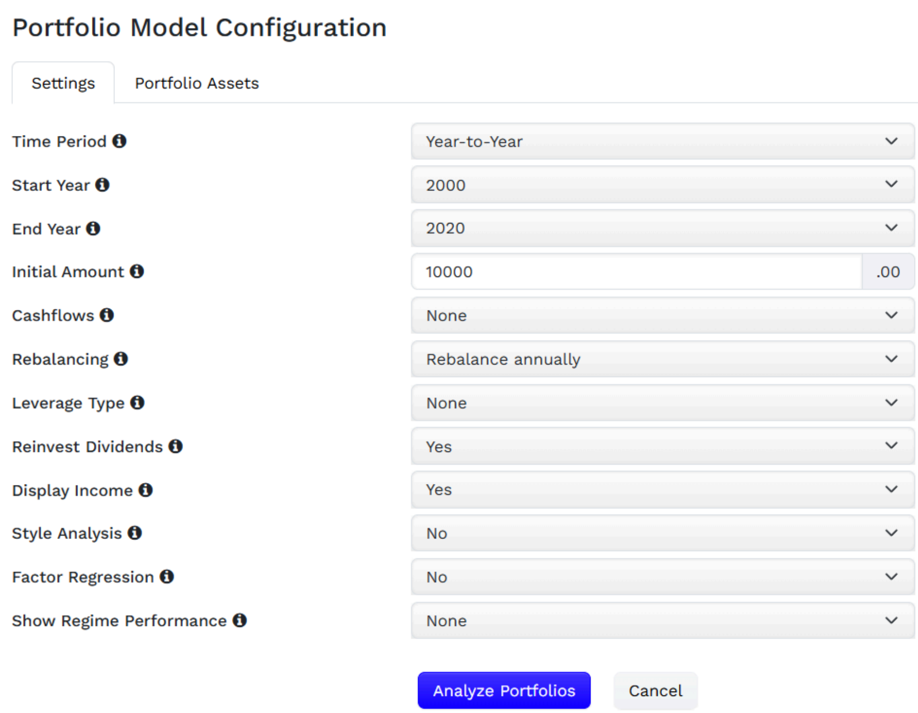
- **Result (Output Screenshot):**



- **Notes: Worked as expected.**

- **TC ID: TD-BP01**

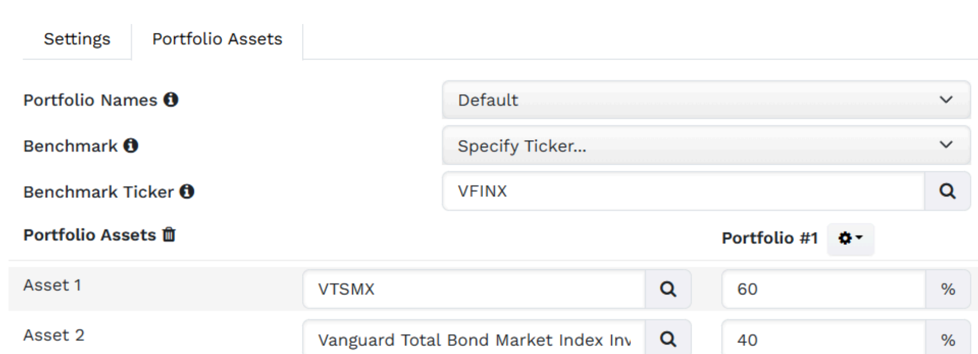
- **Form Filled (Input Screenshot):**


Portfolio Model Configuration

Settings | Portfolio Assets

Time Period	Year-to-Year
Start Year	2000
End Year	2020
Initial Amount	10000 .00
Cashflows	None
Rebalancing	Rebalance annually
Leverage Type	None
Reinvest Dividends	Yes
Display Income	Yes
Style Analysis	No
Factor Regression	No
Show Regime Performance	None

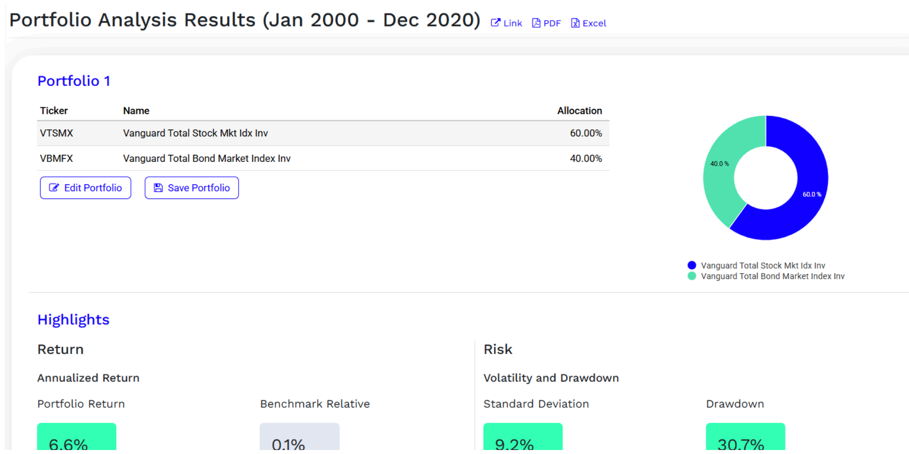
Analyze Portfolios | Cancel


Settings | Portfolio Assets

Portfolio Names	Default
Benchmark	Specify Ticker...
Benchmark Ticker	VFINX

Portfolio Assets		Portfolio #1
Asset 1	VTSMX	60 %
Asset 2	Vanguard Total Bond Market Index Inv	40 %

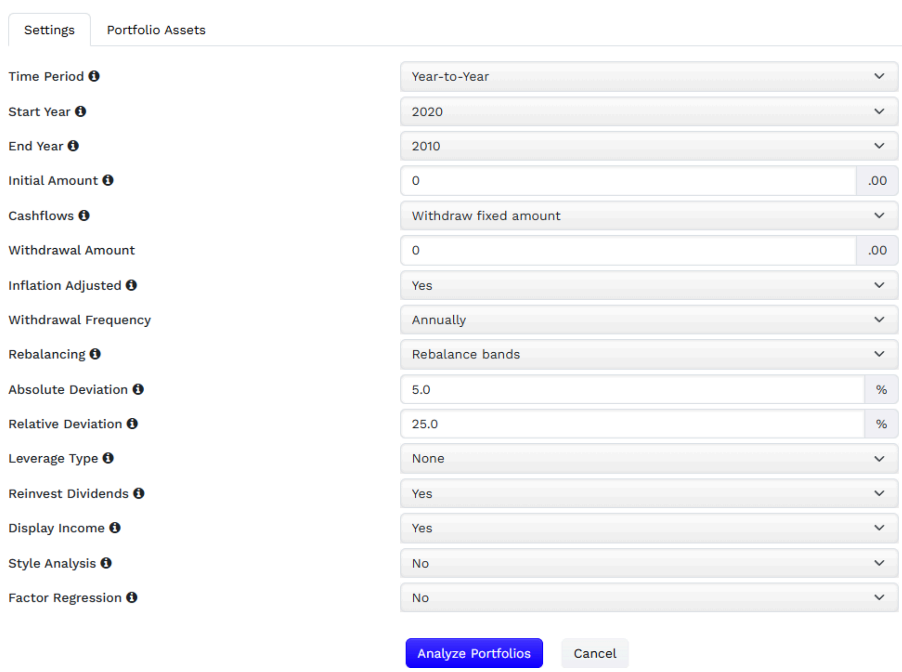
- **Result (Output Screenshot):**

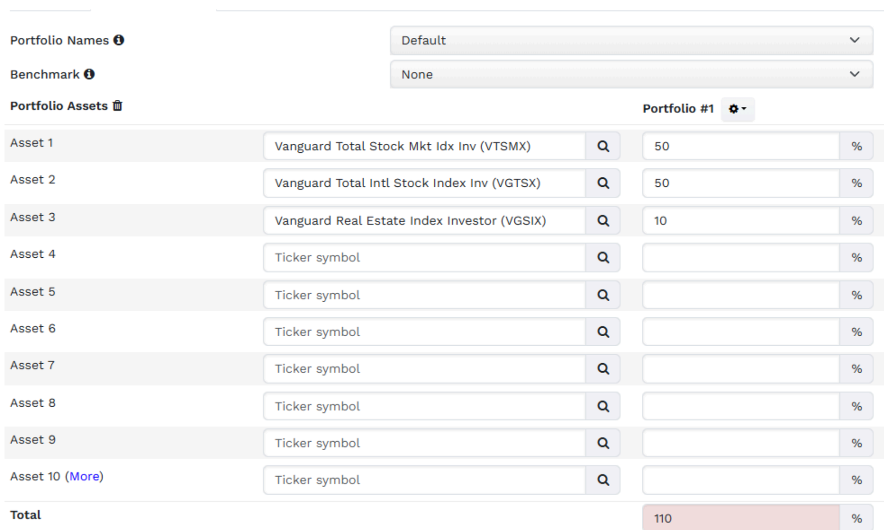


- **Notes: Worked as expected.**

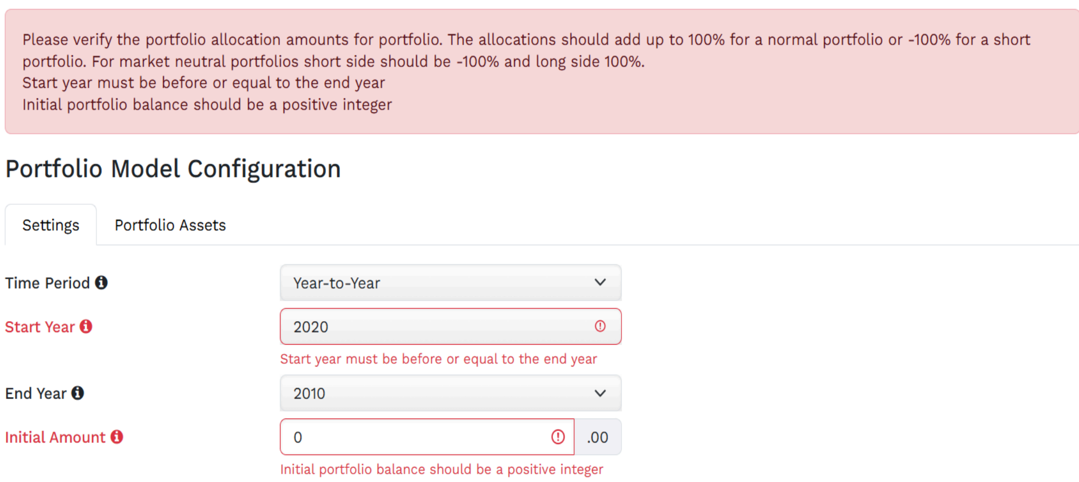
- **TC ID: TC-BP02**

- **Form Filled (Input Screenshot):**





- **Result (Output Screenshot):**

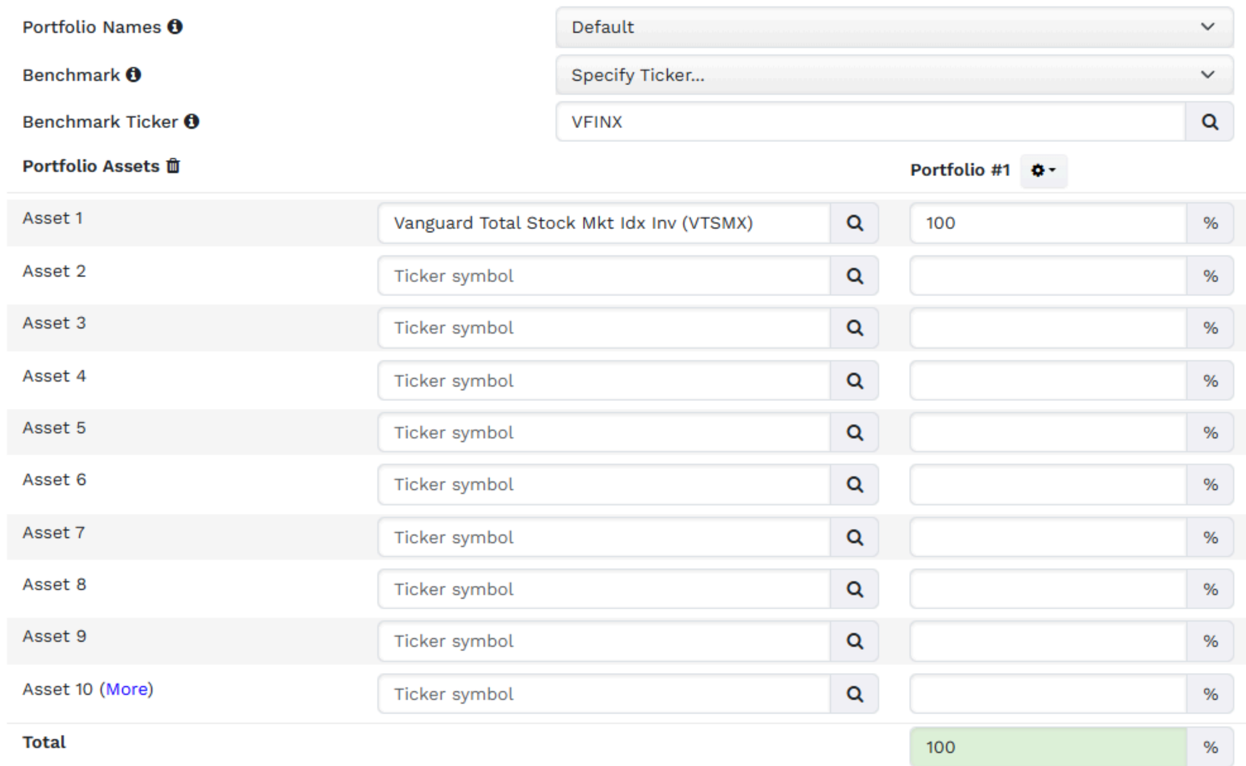


- **Notes:Worked as expected.**

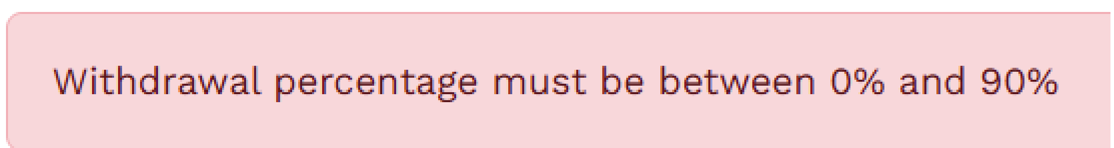
- **TC ID: TC-BP03**

- **Form Filled (Input Screenshot):**

Time Period	Month-to-Month
Start Year	1985
First Month	Jan
End Year	2025
Last Month	Dec
Calendar Aligned	Yes
Initial Amount	1 .00
Cashflows	Withdraw fixed percentage
Withdrawal Percentage	100.0 %
Withdrawal Frequency	Annually
Rebalancing	Rebalance annually
Leverage Type	Fixed Leverage Ratio
Leverage Ratio	1.5 %
Debt Interest	0.0 %
Leveraged Benchmark	No
Reinvest Dividends	Yes
Display Income	Yes
Style Analysis	No
Factor Regression	Yes
Equity Factor Model	Three-Factor Model
Show Regime Performance	None



- **Result (Output Screenshot):**



- **Notes:DEFECT.**

- **TC ID: TC-BP04**

- **Form Filled (Input Screenshot):**

Time Period	Month-to-Month
Start Year	1985
First Month	Jan
End Year	2025
Last Month	Dec
Calendar Aligned	Yes
Initial Amount	1 .00
Cashflows	Withdraw fixed percentage
Withdrawal Percentage	89.0 %
Withdrawal Frequency	Annually
Rebalancing	Rebalance annually
Leverage Type	Fixed Debt Amount
Debt Amount	02-102-221 .00
Debt Interest	0.0 %
Maintenance Margin	25.0 %
Leveraged Benchmark	No
Reinvest Dividends	Yes
Display Income	Yes
Style Analysis	No
Factor Regression	Yes
Equity Factor Model	Three-Factor Model

Portfolio Names	Custom	
Portfolio #1	TEST	
Portfolio #2	TEST2	
Portfolio #3	TEST3	
Benchmark	Specify Ticker...	
Benchmark Ticker	VFINX	

Portfolio Assets		Portfolio #1
Asset 1	Vanguard Total Stock Mkt Idx Inv (VTSMX)	-10 %
Asset 2	Vanguard Total Intl Stock Index Inv (VGTSX)	110 %
Asset 3	Ticker symbol	%
Asset 4	Ticker symbol	%
Asset 5	Ticker symbol	%
Asset 6	Ticker symbol	%
Asset 7	Ticker symbol	%
Asset 8	Ticker symbol	%
Asset 9	Ticker symbol	%
Asset 10 (More)	Ticker symbol	%
Total		100 %

- **Result (Output Screenshot):**

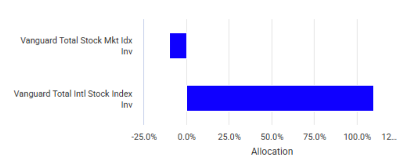
Portfolio Analysis Results (05/01/1996 - 10/24/2025) Link PDF Excel

Note: The time period was constrained by the available data for Vanguard Total Intl Stock Index Inv (VGTSX) [May 1996 - Sep 2025].

TEST

Ticker	Name	Allocation
VTSMX	Vanguard Total Stock Mkt Idx Inv	-10.00%
VGTSX	Vanguard Total Intl Stock Index Inv	110.00%

Edit Portfolio Save Portfolio



Highlights

Return

Annualized Return

Portfolio Return	Benchmark Relative
-88.0%	-0.6%

Benchmark: Vanguard 500 Index Investor

Risk

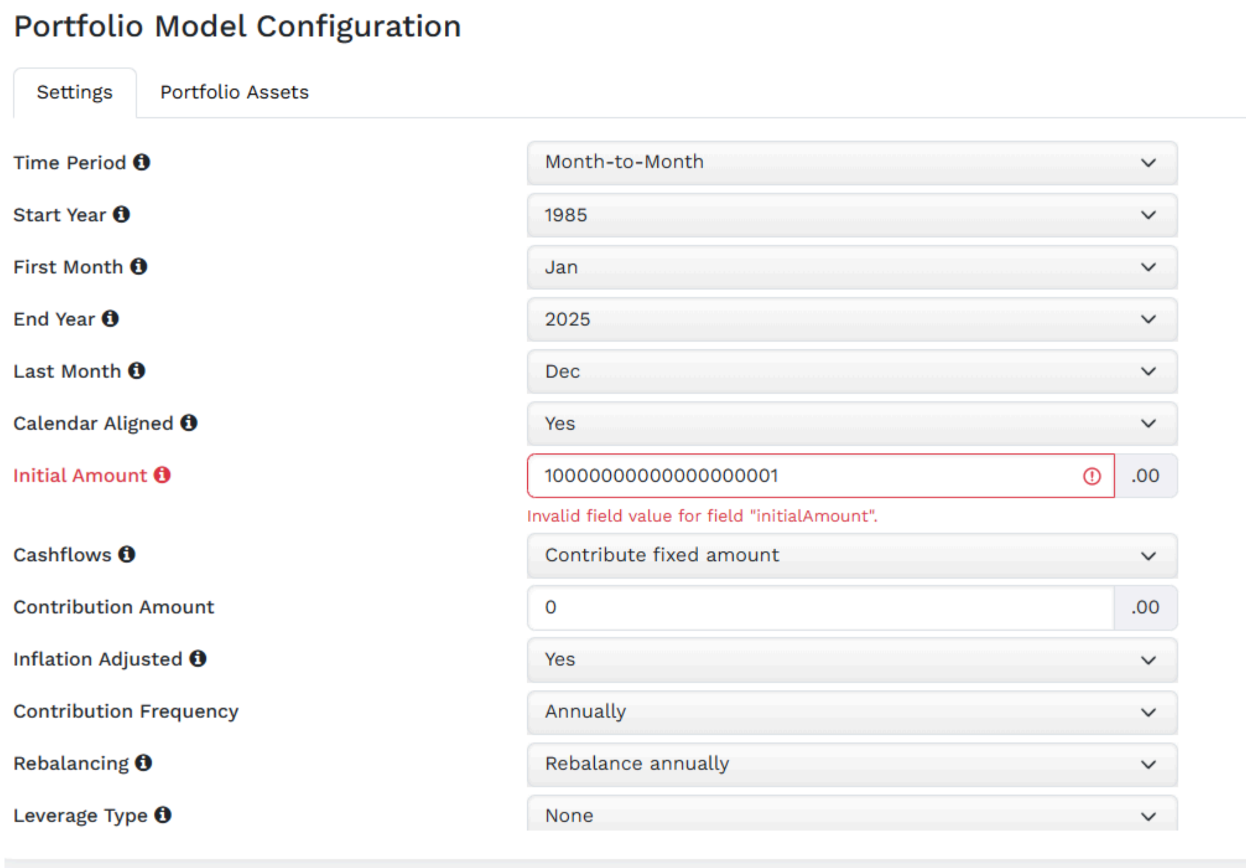
Volatility and Drawdown

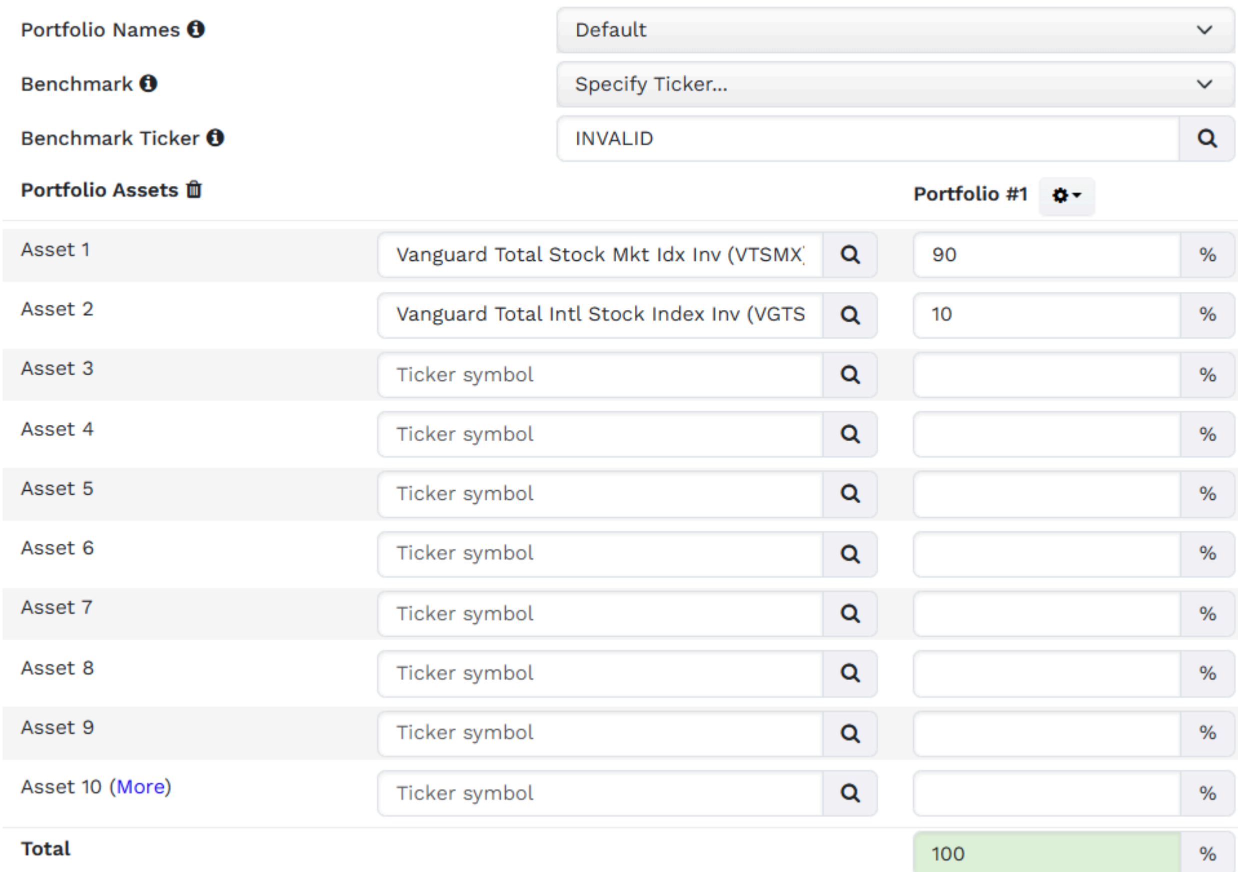
Standard Deviation	Drawdown
17.1%	100.0%

- **Notes:Negative Asset Allocation Accepted (e.g. -10% with 100%).Invalid Leverage Amount Input (e.g. “02-102-221”) and still ran.DEFECT.**

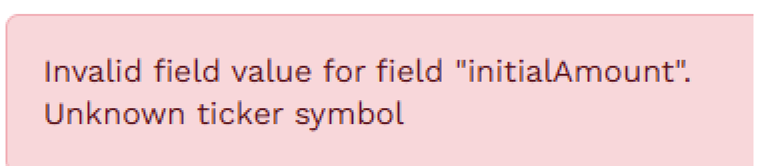
- **TC ID: TC-BP05**

- **Form Filled (Input Screenshot):**





- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-FF01**

- **Form Filled (Input Screenshot):**

Search Criteria

Equity Factor Returns	Fama-French Research Factors
Stock Market	United States
Equity Factor Model	Three-Factor Model
Fixed Income Factor Model	None
Fund Type	ETF
Fund Category	US Equity Funds
Time Period	24 Months
R^2 Threshold	>= 95%
Statistical Significance	☐ MKT-RF ☐ SMB ☐ HML ☐ Alpha

- **Result (Output Screenshot):**

Factor Regressions

Excel

Search Results

Ticker	Name	Start Date	End Date	Annual Alpha	MKT-RF	SMB	HML	R^2
ACVF	American Conservative Values ETF	Sep 2023	Aug 2025	-3.75%	0.99	-0.17	0.14	96.5%
AESR	Anfield US Equity Sector Rotation ETF	Sep 2023	Aug 2025	-1.70%	1.16	-0.19	-0.05	97.1%
AFLG	First Trust Active Factor Large Cap ETF	Sep 2023	Aug 2025	-0.40%	0.97	-0.11	0.17	95.4%
APUE	ActivePassive U.S. Equity ETF	Sep 2023	Aug 2025	-0.76%	0.98	-0.02	0.04	99.5%
AVSC	Avantis US Small Cap Equity ETF	Sep 2023	Aug 2025	0.52%	0.92	1.05	0.52	98.3%
AVSU	Avantis Responsible US Equity ETF	Sep 2023	Aug 2025	-2.68%	1.05	0.08	0.15	99.4%
AVUS	Avantis US Equity ETF	Sep 2023	Aug 2025	-1.87%	1.00	0.08	0.19	98.9%
AVUV	Avantis US Small Cap Value ETF	Sep 2023	Aug 2025	-0.43%	0.91	0.87	0.65	95.8%
BBLU	EA Bridgeway Blue Chip ETF	Sep 2023	Aug 2025	-0.60%	0.93	-0.18	0.08	95.7%
BBMC	JPMorgan BetaBuilders US Mid Cap Eq ETF	Sep 2023	Aug 2025	-4.15%	1.10	0.43	0.35	95.9%
BBSC	JPMorgan BetaBuilders US Sml Cp Eq ETF	Sep 2023	Aug 2025	0.21%	1.06	0.99	0.40	99.3%
BBUS	JPMorgan BetaBuilders US Equity ETF	Sep 2023	Aug 2025	-0.42%	0.99	-0.08	-0.01	99.8%
BKLC	BNY Mellon US Large Cap Core Equity ETF	Sep 2023	Aug 2025	0.09%	1.00	-0.09	-0.04	99.4%

- **Notes:Worked as expected.**

- **TC ID: TC-FF02**

- **Form Filled (Input Screenshot):**

Search Criteria

Equity Factor Returns	AQR Factors
Stock Market	Intl Developed Ex US
Equity Factor Model	Six-Factor Model
Fund Type	Mutual Fund
Fund Category	Intl Equity Funds
Time Period	48 Months
R^2 Threshold	>= 80%
Statistical Significance	☑ MKT-RF ☐ SMB ☐ HML ☑ MOM ☐ QMJ ☑ BAB ☐ Alpha

- **Result (Output Screenshot):**

Factor Regressions

Excel

Search Results

Ticker	Name	Start Date	End Date	Annual Alpha	MKT-RF	SMB	HML	MOM	QMJ	BAB	R^2
ABNIX	abrdn International Small Cap Active ETF	Aug 2021	Jul 2025	2.06%	**1.21**	0.41	**-0.69**	**0.47**	-0.22	**-0.42**	92.3%
ACIOX	American Century International Opps I	Aug 2021	Jul 2025	-1.75%	**1.13**	**0.59**	**-0.47**	**0.54**	-0.22	**-0.69**	92.9%
AIMOX	AQR International Momentum Style I	Aug 2021	Jul 2025	-2.74%	**1.21**	0.10	-0.02	**0.47**	0.21	**-0.38**	95.1%
AIOCX	American Century International Opps C	Aug 2021	Jul 2025	-3.13%	**1.13**	**0.59**	**-0.47**	**0.56**	-0.22	**-0.69**	92.8%
AIOIX	American Century International Opps Inv	Aug 2021	Jul 2025	-1.90%	**1.13**	**0.59**	**-0.47**	**0.55**	-0.22	**-0.69**	92.8%
AIONX	AQR International Momentum Style N	Aug 2021	Jul 2025	-3.02%	**1.21**	0.10	-0.01	**0.47**	0.22	**-0.38**	95.0%
AIORX	American Century International Opps R	Aug 2021	Jul 2025	-2.65%	**1.13**	**0.58**	**-0.47**	**0.55**	-0.22	**-0.69**	92.8%
AIVOX	American Century International Opps A	Aug 2021	Jul 2025	-2.28%	**1.13**	**0.59**	**-0.47**	**0.55**	-0.20	**-0.70**	92.8%
ANTMX	American Century Intl Sm-Md Cp G	Aug 2021	Jul 2025	-1.63%	**1.14**	0.51	**-0.35**	**0.42**	-0.12	**-0.49**	90.2%
	American Century Intl Sm-Md										

- **Notes:Worked as expected.**

- **TC ID: TC-FF03**

- **Form Filled (Input Screenshot):**

Search Criteria

Equity Factor Returns	Alpha Architect Factors
Stock Market	United States
Equity Factor Model	Four-Factor Model
Fixed Income Factor Model	Term + Credit
Fund Type	Closed-End Fund
Fund Category	Fixed Income
Time Period	60 Months
R^2 Threshold	>= 90%
Statistical Significance	☑ MKT-RF ☑ SMB ☑ HML ☑ MOM ☑ TRM ☑ ITRM ☑ LTRM ☑ CDT ☑ HY ☑ Alpha

- **Result (Output Screenshot):**

Factor Regressions

Excel

Search Results

Ticker	Name	Start Date	End Date	Annual Alpha	MKT-RF	SMB	HML	MOM	TRM	CDT	R^2
No data available in table											

Search: Showing 0 to 0 of 0 entries

First Previous Next Last

- **Notes:Worked as expected.**

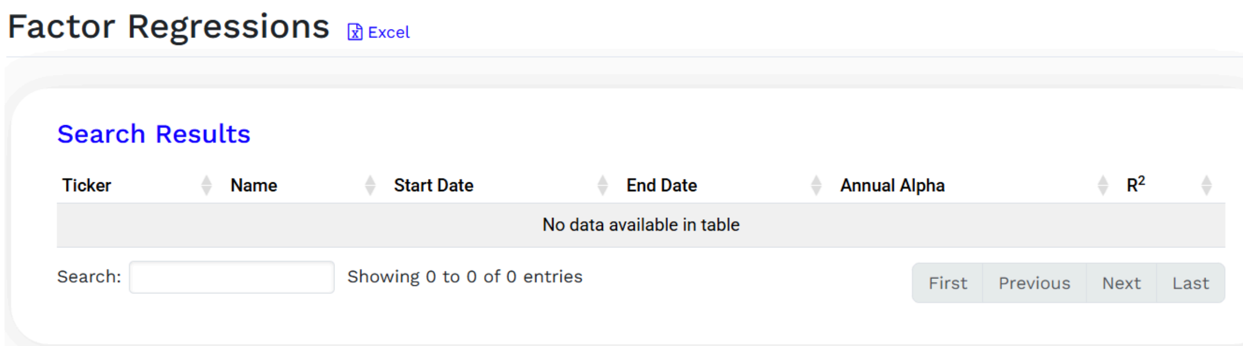
- # TC ID: TC-FF04

- **Form Filled (Input Screenshot):**

Search Criteria

Equity Factor Returns	Fama-French Research Factors
Stock Market	United States
Equity Factor Model	None
Fixed Income Factor Model	None
Fund Type	All
Fund Category	Alternatives
Time Period	Maximum
R^2 Threshold	>= 95%
Statistical Significance	☑ Alpha

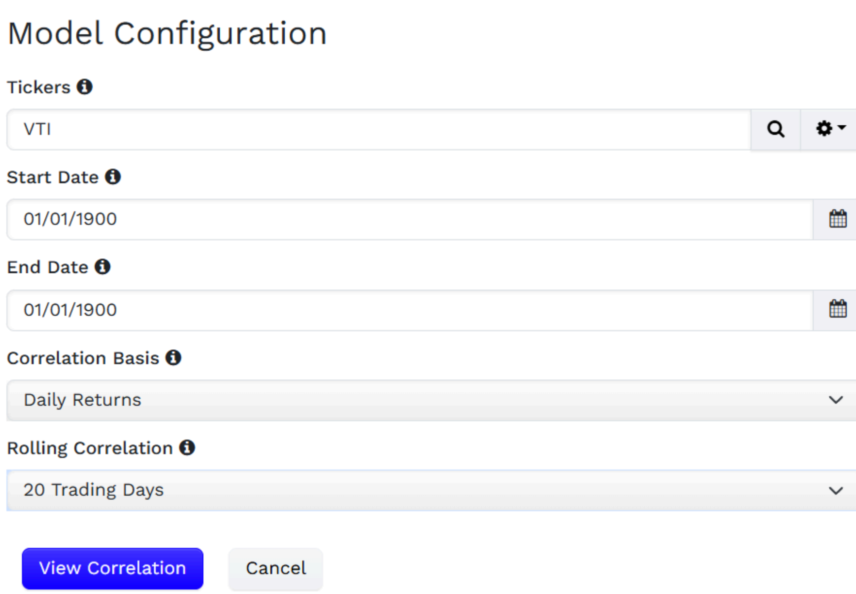
- **Result (Output Screenshot):**



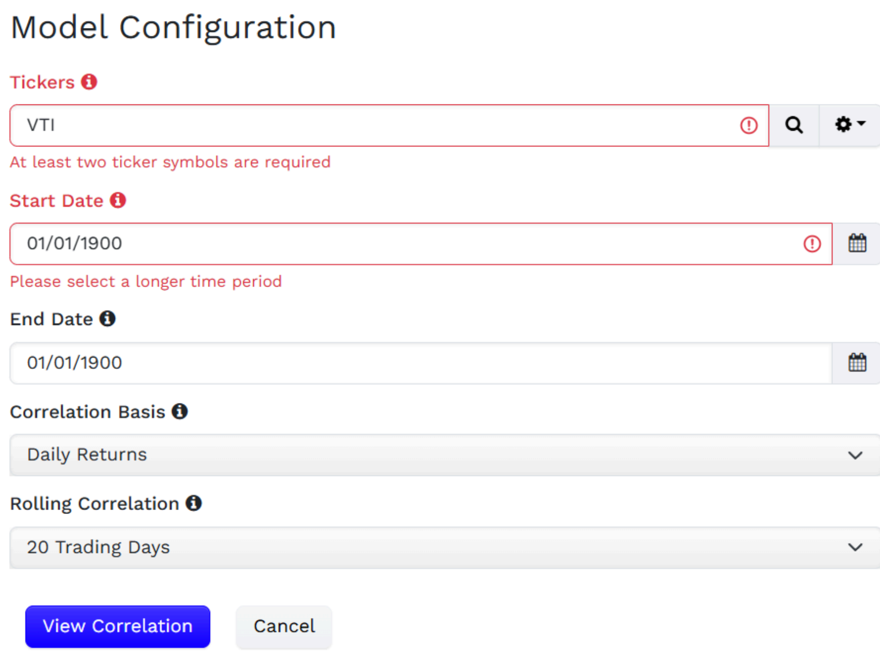
- **Notes:Worked as expected.**

- **TC ID: TC-AC01**

- **Form Filled (Input Screenshot):**



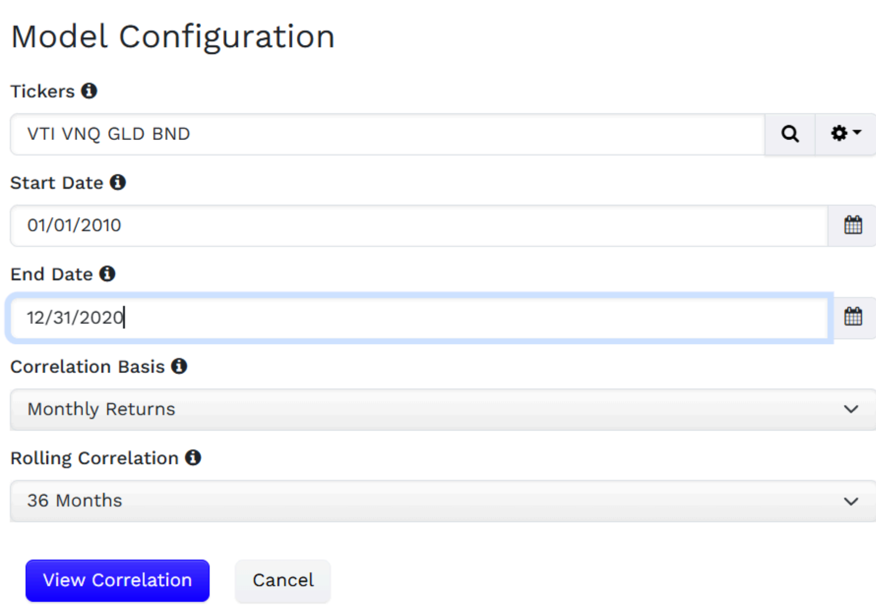
- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-AC02**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**

Correlation Results Link Excel

Note: Rolling correlations are only shown for the first three asset pairs.

Asset Correlations

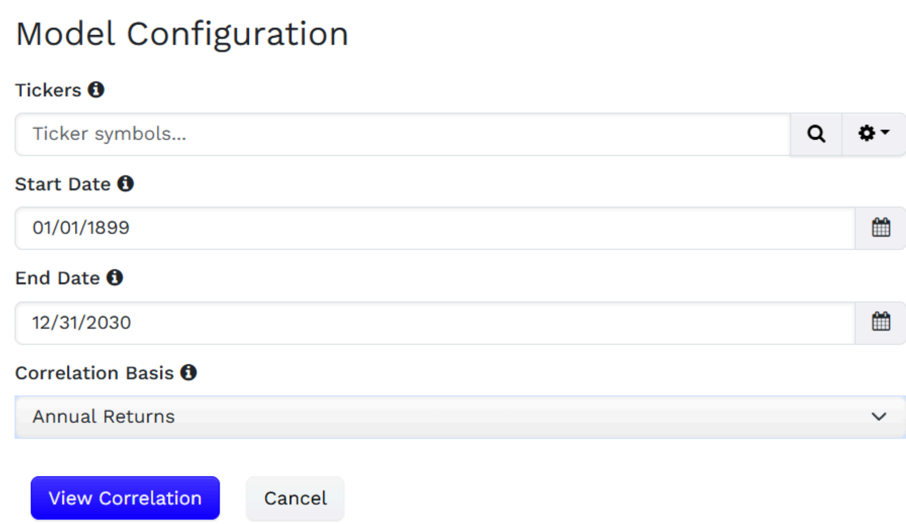
Name	Ticker	VTI	VNQ	GLD	BND	Annualized Return	Daily Standard Deviation	Monthly Standard Deviation	Annualized Standard Deviation
Vanguard Total Stock Market ETF	VTI	1.00	0.70	0.07	-0.06	14.10%	1.11%	4.23%	14.64%
Vanguard Real Estate ETF	VNQ	0.70	1.00	0.16	0.36	10.33%	1.33%	4.77%	16.54%
SPDR Gold Shares	GLD	0.07	0.16	1.00	0.42	4.73%	1.00%	4.68%	16.23%
Vanguard Total Bond Market ETF	BND	-0.06	0.36	0.42	1.00	4.02%	0.26%	0.92%	3.17%

Asset correlations for time period 01/01/2010 - 12/31/2020 based on monthly returns

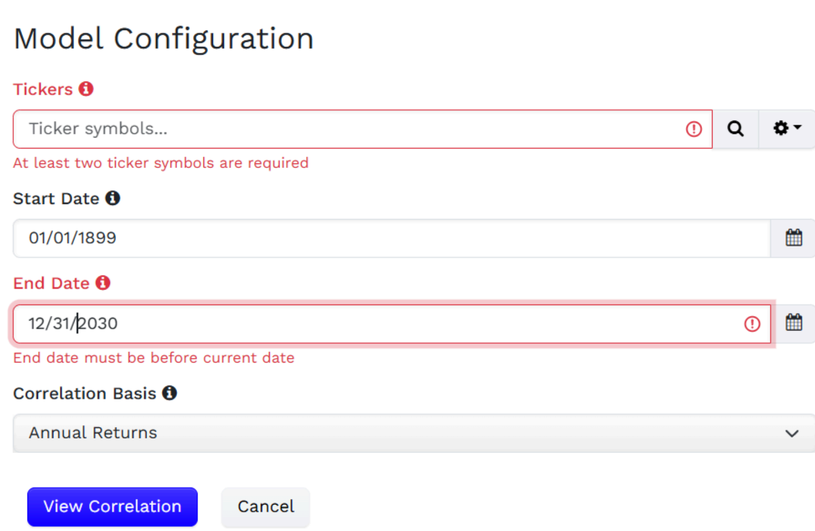
- **Notes:Worked as expected.**

- **TC ID: TC-AC03**

- **Form Filled (Input Screenshot):**



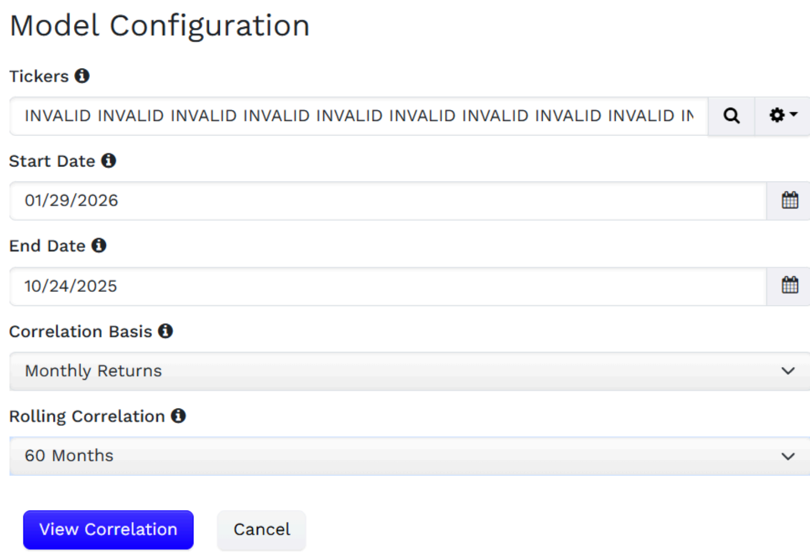
- **Result (Output Screenshot):**



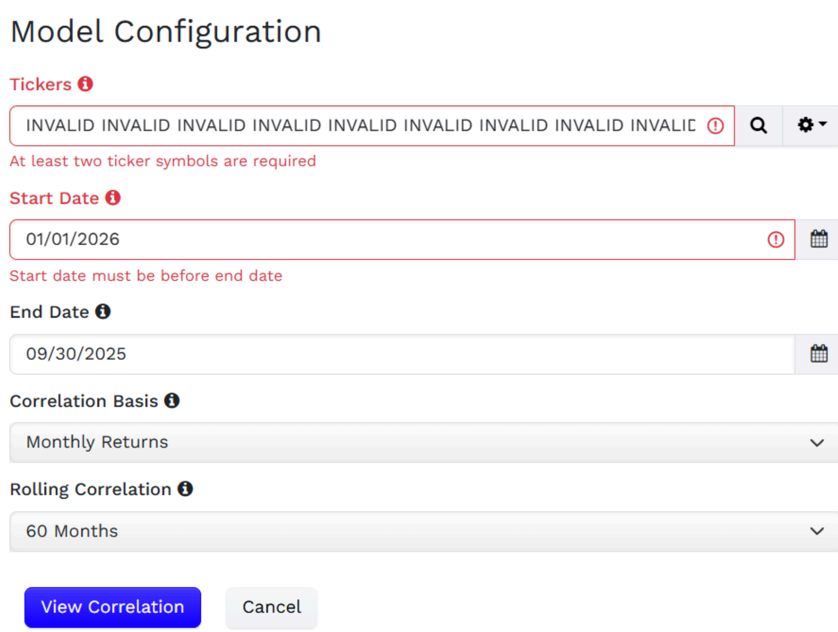
- **Notes:Worked as expected.**

- **TC ID: TC-AC04**

- **Form Filled (Input Screenshot):**



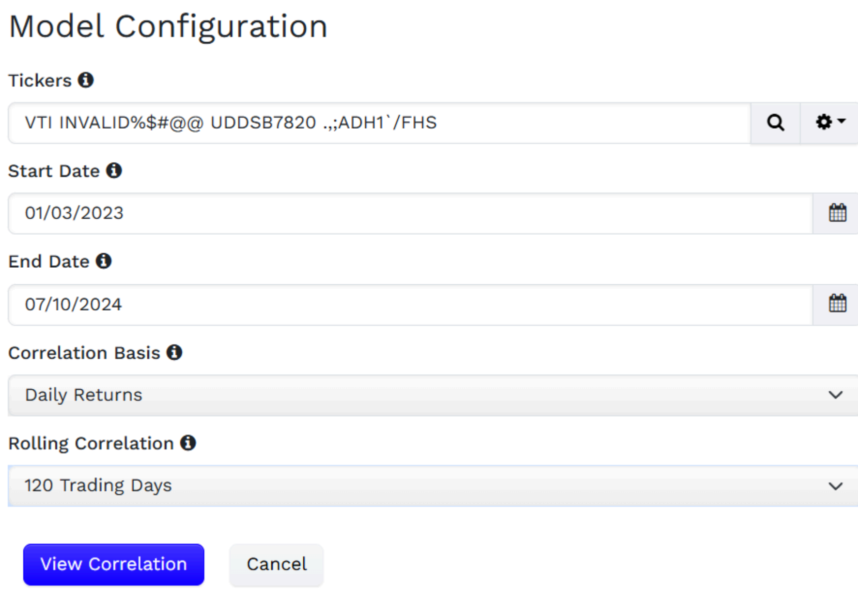
- **Result (Output Screenshot):**



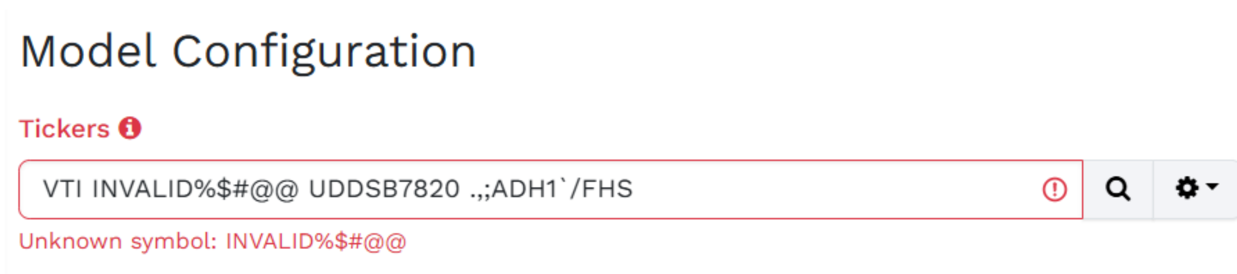
- **Notes:Worked as expected.**

- **TC ID: TC-AC05**

- **Form Filled (Input Screenshot):**



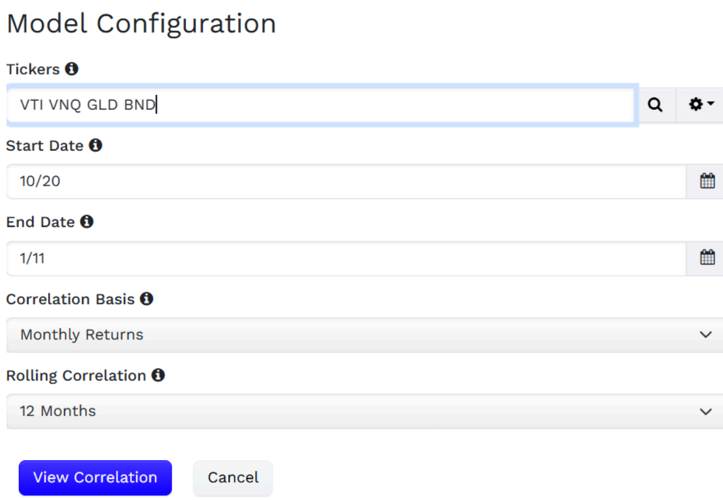
- **Result (Output Screenshot):**



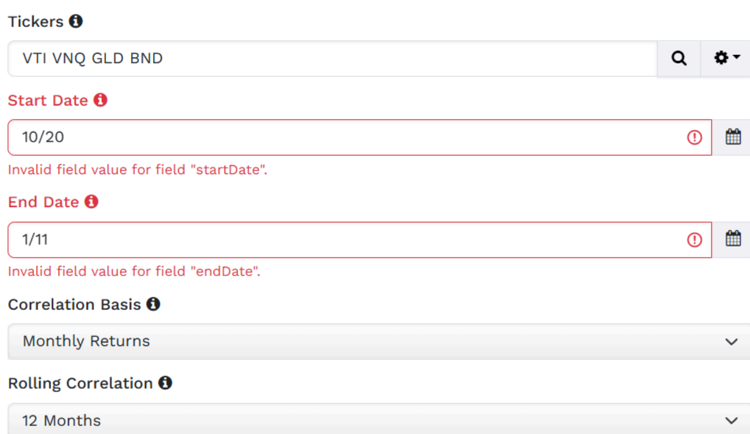
- **Notes:Worked as expected.**

- **TC ID: TC-AC06**

- **Form Filled (Input Screenshot):**



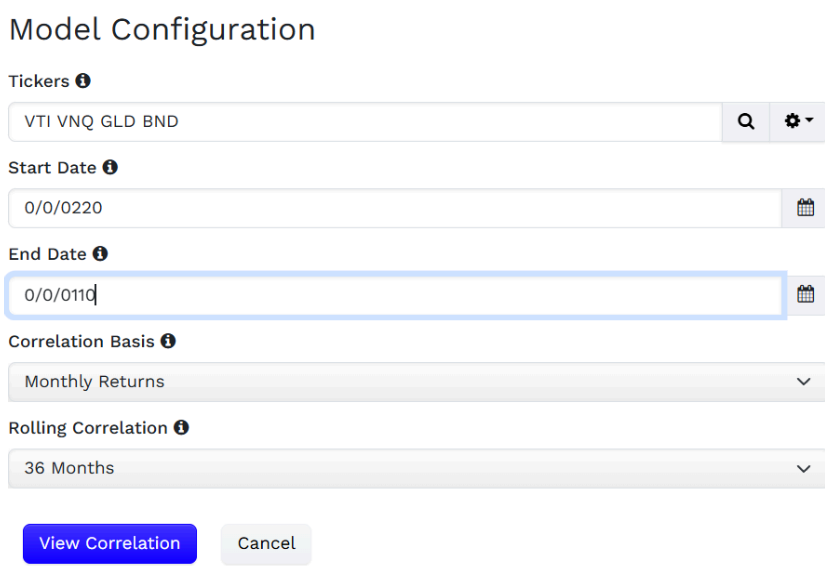
- **Result (Output Screenshot):**



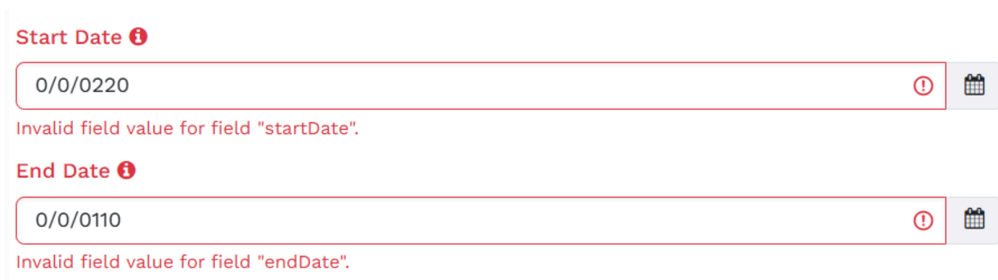
- **Notes:Worked as expected.**

- **TC ID: TC-AC07**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-FS01**

- **Form Filled (Input Screenshot):**

Search Criteria

Fund Type

All

Asset Class

All

Benchmark

All

Performance History

All

Expense Ratio

All

- **Result (Output Screenshot):**

Fund Performance

Search Results

				Performance				Risk Measures			Excess Returns				Fund Information				
Ticker	Name	Asset Class	Category	YTD	1Y	3Y	5Y	Sharpe	Sortino	Volatility	Tracking Error	Information Ratio	Upside Capture	Downside Capture	Yield SEC	Yield TTM	ER	Assets	Inception
SVIX	-1x Short VIX Futures ETF	Miscellaneous	Inverse Equity	-15.73%	-21.02%	27.52%		0.63	1.01	56.08%	47.93%	0.05	207.04	380.21	-1.26%		3.93%	165.17 M	2022-03-28
TNRAX	1290 Avantis U.S. Large Cap Growth A	U.S. Equity	Large Growth	14.35%	20.35%						4.91%	-0.44	94.46	99.63			0.90%	203.18 M	2023-11-30
TNXIX	1290 Avantis U.S. Large Cap Growth I	U.S. Equity	Large Growth	14.56%	20.65%	23.07%	14.32%	1.23	2.21	13.89%	4.92%	-0.38	95.03	98.98		0.08%	0.65%	203.18 M	2017-02-27
TNUAX	1290 Diversified Bond A	Taxable Bond	Intermediate Core-Plus Bond	9.67%	1.77%	4.30%	0.14%	0.01	0.01	11.41%	5.68%	-0.11	148.53	190.18	5.93%	6.23%	0.75%	569.12 M	2015-07-06
TNUIX	1290 Diversified Bond I	Taxable Bond	Intermediate Core-Plus Bond	9.87%	2.02%	4.56%	0.38%	0.03	0.05	11.41%	5.68%	-0.06	149.73	188.50	6.47%	6.40%	0.50%	569.12 M	2015-07-06
TNURX	1290 Diversified Bond R	Taxable Bond	Intermediate Core-Plus Bond	9.51%	1.55%	4.05%	-0.11%	-0.01	-0.02	11.41%	5.68%	-0.15	147.44	191.84	5.96%	6.08%	1.00%	569.12 M	2015-07-06
ESCFX	1290 Essex Small Cap Growth A	U.S. Equity	Small Growth	26.50%	37.21%	19.66%		0.67	1.15	24.01%	15.97%	-0.33	115.11	183.10			1.13%	93.49 M	2022-07-11
ESCJX	1290 Essex Small Cap Growth I	U.S. Equity	Small Growth	26.74%	37.56%	19.96%		0.68	1.17	24.01%	15.97%	-0.31	115.65	182.41		0.14%	0.88%	93.49 M	2022-07-11
ESCKX	1290 Essex Small Cap Growth R	U.S. Equity	Small Growth	26.27%	36.87%	19.36%		0.66	1.13	24.00%	15.96%	-0.35	114.58	183.78			1.38%	93.49 M	2022-07-11
TNVAX	1290 GAMCO Small/Mid Cap Value A	U.S. Equity	Small Value	10.83%	8.35%	18.30%	14.63%	0.70	1.32	20.21%	12.70%	-0.52	97.33	141.74		0.74%	1.20%	182.46 M	2014-11-12
TNVIX	1290 GAMCO Small/Mid Cap Value I	U.S. Equity	Small Value	11.03%	8.62%	18.60%	14.91%	0.71	1.35	20.21%	12.70%	-0.50	97.86	141.05		0.96%	0.95%	182.46 M	2014-11-12
TNVRX	1290 GAMCO Small/Mid Cap Value R	U.S. Equity	Small Value	10.62%	8.08%	18.01%	14.34%	0.69	1.29	20.21%	12.70%	-0.55	96.79	142.42		0.52%	1.45%	182.46 M	2014-11-12
TNHAX	1290 High Yield Bond A	Taxable Bond	High Yield Bond	6.50%	6.53%	10.13%	4.77%	1.04	2.11	4.85%	4.35%	1.20	80.01	-6.33	5.48%	6.03%	1.00%	86.89 M	2014-11-12

- **Notes:Worked as expected.**

- **TC ID: TC-FS02**

- **Form Filled (Input Screenshot):**

Search Criteria

Fund Type

ETF

Asset Class

U.S. Equity

Fund Category

Mid-Cap Growth
Mid-Cap Value
Small Blend
Small Growth
Small Value

Benchmark

S&P 1500 TR

Performance History

3 or more years

Expense Ratio

< 0.25%

- **Result (Output Screenshot):**

Fund Performance

Search Results

				Performance				Risk Measures	
Ticker	Name	Asset Class	Category	YTD	1Y	3Y	5Y	Sharpe	Sortino
MIDE	Xtrackers S&P MidCap 400 Scrd&Scrn ETF	U.S. Equity	Mid-Cap Blend	6.36%	5.85%	14.83%		0.58	1.00
XMHQ	Invesco S&P MidCap Quality ETF	U.S. Equity	Mid-Cap Blend	7.10%	3.01%	21.76%	16.16%	0.87	1.59

Search: Showing 1 to 2 of 2 entries

First Previous Next Last

- **Notes:Worked as expected.**

- **TC ID: TC-FS03**

- **Form Filled (Input Screenshot):**

Search Criteria

Fund Type

Mutual Fund

Asset Class

Taxable Bond

Fund Category

Short Government
Short-Term Bond
Short-Term Inflation-Protected Bond
Target Maturity
Ultrashort Bond

Benchmark

Russell 1000 TR USD

Performance History

5 or more years

Expense Ratio

< 0.50%

- **Result (Output Screenshot):**

Fund Performance

Search Results

				Performance				Risk Measures			E
Ticker	Name	Asset Class	Category	YTD	1Y	3Y	5Y	Sharpe	Sortino	Volatility	T E
										No data availab	

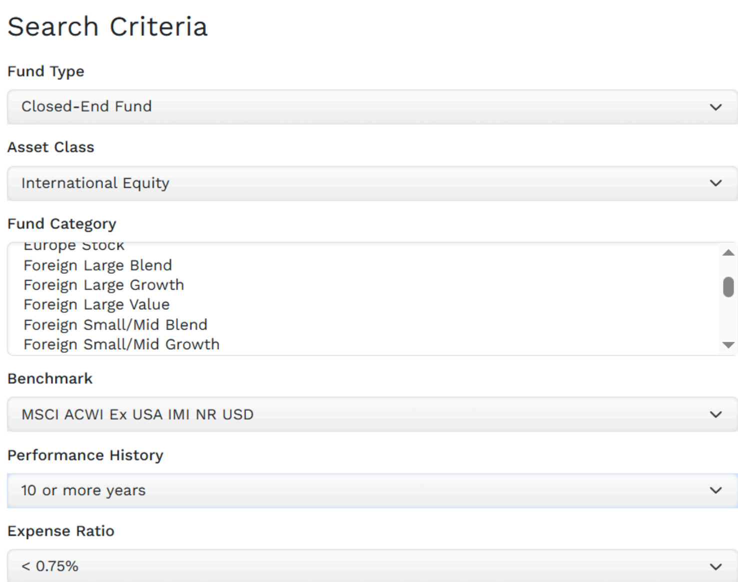
Search: Showing 0 to 0 of 0 entries

First Previous Next Last

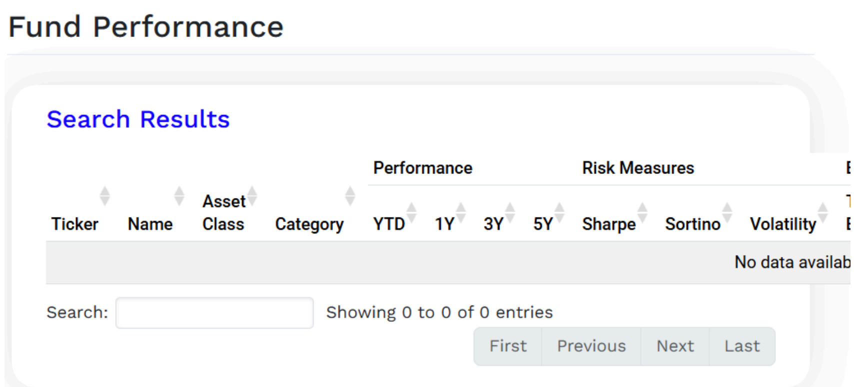
- **Notes:Worked as expected.**

- **TC ID: TC-FS04**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-FS05**

- **Form Filled (Input Screenshot):**

Fund Screener Overview

Find ETF or mutual fund based on category and performance. You can select any fund for more detailed performance and risk statistics analysis.

Search Criteria

Fund Type

ETF

Asset Class

Municipal Bond

Fund Category

High Yield Muni
Muni California Intermediate
Muni California Long
Muni Massachusetts
Muni Minnesota

Benchmark

Bloomberg Commodity TR USD

Performance History

15 or more years

Expense Ratio

< 1.00%

- **Result (Output Screenshot):**

Fund Performance

Search Results

				Performance				Risk Measures			
Ticker	Name	Asset Class	Category	YTD	1Y	3Y	5Y	Sharpe	Sortino	Volatility	T E
No data availab											

Search: Showing 0 to 0 of 0 entries

First Previous Next Last

- **Notes:Worked as expected.**

- **TC ID: TC-FS06**

- **Form Filled (Input Screenshot):**

Search Criteria

Fund Type

Mutual Fund

Asset Class

Sector Equity

Fund Category

Energy Limited Partnership
Equity Energy
Equity Precious Metals
Financial
Global Real Estate
Health

Benchmark

All

Performance History

20 or more years

Expense Ratio

All

Update Table

- **Result (Output Screenshot):**

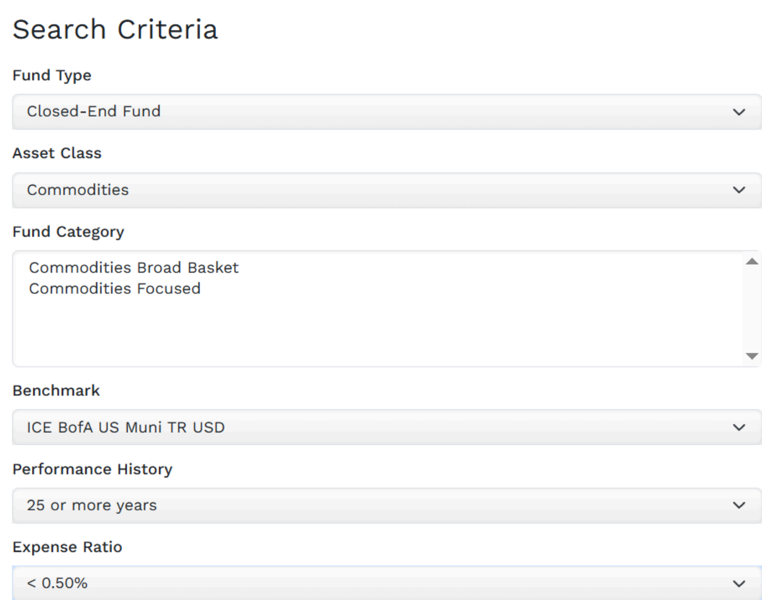
Search Results

Ticker	Name	Asset Class	Category	Performance				Risk Measures	
				YTD	1Y	3Y	5Y	Sharpe	Sorti
ACGGX	American Century Global Gold A	Sector Equity	Equity Precious Metals	124.09%	97.82%	49.45%	14.80%	1.23	2
AGREX	Invesco Global Real Estate A	Sector Equity	Global Real Estate	8.21%	-3.08%	6.80%	3.07%	0.19	(
AHSAX	Alger Health Sciences A	Sector Equity	Health	-3.24%	-7.78%	1.07%	-2.87%	-0.20	-(
AHSCX	Alger Health Sciences C	Sector Equity	Health	-3.83%	-8.28%	0.33%	-3.60%	-0.25	-(
AIGYX	abrdn Real Estate Fund Instl	Sector Equity	Real Estate	5.13%	-0.11%	10.90%	8.32%	0.43	(
AREEX	American Century Real Estate A	Sector Equity	Real Estate	2.41%	-4.09%	8.28%	6.69%	0.28	(
ARIIX	AB Global Real Estate Investment II I	Sector Equity	Global Real Estate	10.39%	0.26%	11.46%	6.46%	0.46	(

- **Notes:Worked as expected.**

- ## TC ID: TC-FS07

- **Form Filled (Input Screenshot):**


Search Criteria

Fund Type

Closed-End Fund

Asset Class

Commodities

Fund Category

Commodities Broad Basket
Commodities Focused

Benchmark

ICE BofA US Muni TR USD

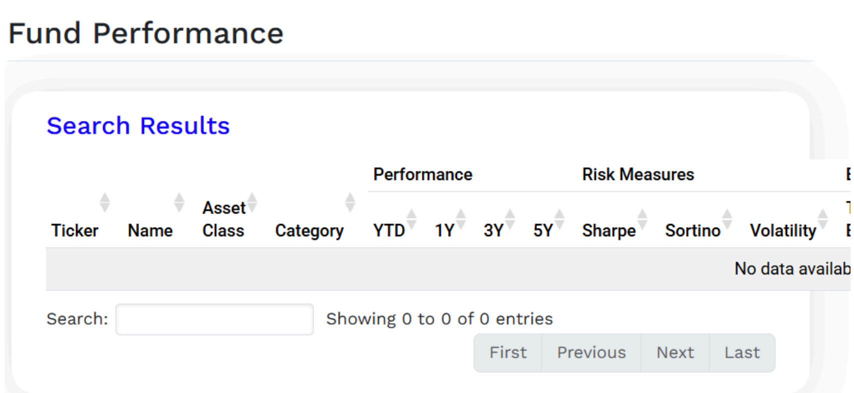
Performance History

25 or more years

Expense Ratio

< 0.50%

- **Result (Output Screenshot):**


Fund Performance

Search Results

				Performance				Risk Measures			E
Ticker	Name	Asset Class	Category	YTD	1Y	3Y	5Y	Sharpe	Sortino	Volatility	T E
No data availab											

Search: Showing 0 to 0 of 0 entries

First Previous Next Last

- **Notes:Worked as expected.**

- ## TC ID: TC-MP01

- **Form Filled (Input Screenshot):**

Model Configuration

Ticker	Fidelity Low-Priced Stock (FLPSX)
Benchmark	Vanguard Mid-Cap Value ETF (VOE)
Risk Factor Model	Fama-French US Equity Factors
Regression Method	LASSO + OLS
Regime Performance	No
Start Date	1/1/2015
End Date	12/31/2025
Periodicity	Monthly Returns
Rolling Period	36 Months

- **Result (Output Screenshot):**

Manager Performance (Jan 2015 - Sep 2025) Link PDF Excel

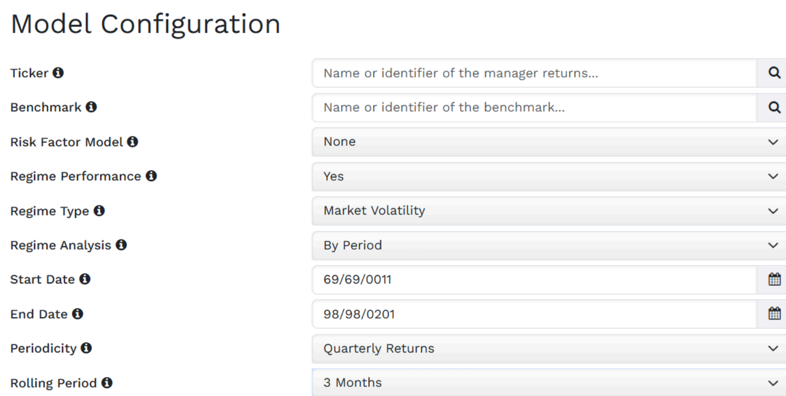
Manager Information

Name	Fidelity Low-Priced Stock
Benchmark	Vanguard Mid-Cap Value ETF
Available Data	Jan 1990 - Sep 2025, available benchmark period is Sep 2006 - Sep 2025
Analysis Time Period	Jan 2015 - Sep 2025
Monthly Periods	129
Annualized Excess Return	0.44%
Annualized Tracking Error	4.83%
Information Ratio	0.09
Benchmark Correlation	0.96
Sharpe Ratio - Account	0.54
Sharpe Ratio - Benchmark	0.47
Modigliani–Modigliani Measure	11.08%
Cumulative Return - Account	159.01%
Cumulative Return - Benchmark	147.90%
Maximum Drawdown - Account	-28.04% (Mar 2020)

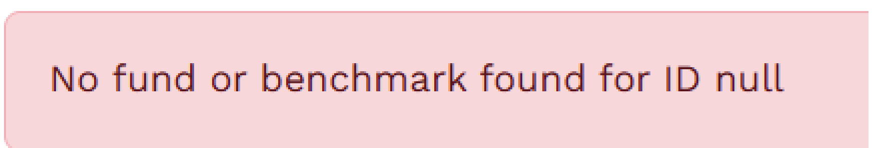
- **Notes:Worked as expected.**

- **TC ID: TC-MP02**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-MP03**

- **Form Filled (Input Screenshot):**

Model Configuration

Ticker	Fidelity Low-Priced Stock (Fl
Benchmark	Vanguard Mid-Cap Value ETF
Risk Factor Model	SRL Analytics
Regression Method	LASSO + OLS
Regime Performance	Yes
Regime Type	Market Volatility
Regime Analysis	In Aggregate
Start Date	01/01/2035
End Date	01/31/2055
Periodicity	Monthly Returns
Rolling Period	60 Months

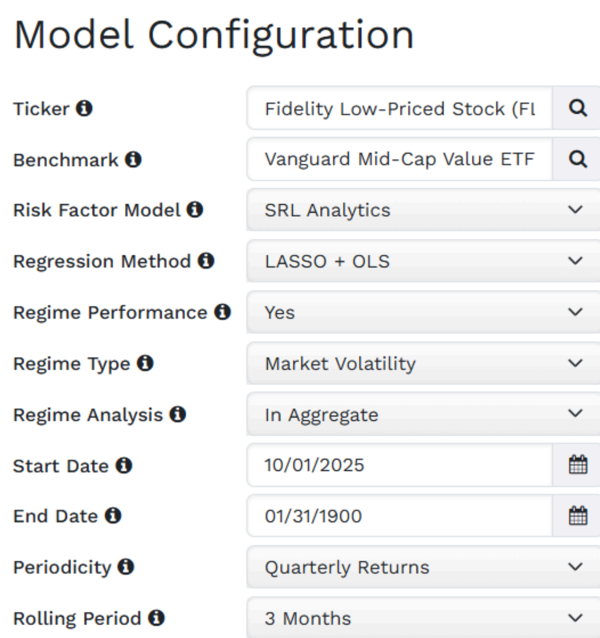
- **Result (Output Screenshot):**

> At least 3 months of data required for analysis, but the available or selected time period is shorter. The time period was constrained by the available data for Fidelity Low-Priced Stock (FLPSX) [Sep 2006 - Sep 2025].

- **Notes:Worked as expected.**

- ## TC ID: TC-MP04

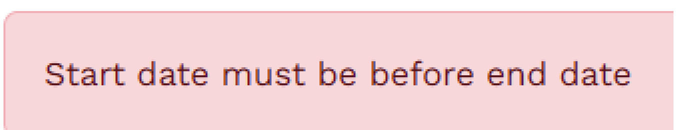
- **Form Filled (Input Screenshot):**



Model Configuration

Ticker	Fidelity Low-Priced Stock (Fl
Benchmark	Vanguard Mid-Cap Value ETF
Risk Factor Model	SRL Analytics
Regression Method	LASSO + OLS
Regime Performance	Yes
Regime Type	Market Volatility
Regime Analysis	In Aggregate
Start Date	10/01/2025
End Date	01/31/1900
Periodicity	Quarterly Returns
Rolling Period	3 Months

- **Result (Output Screenshot):**

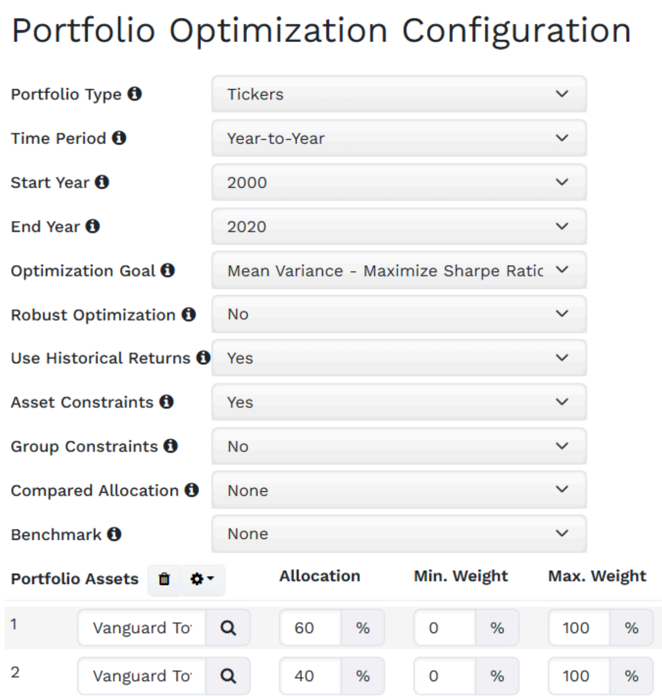


Start date must be before end date

- **Notes:Worked as expected.**

- ## TC ID: TC-PO01

- **Form Filled (Input Screenshot):**

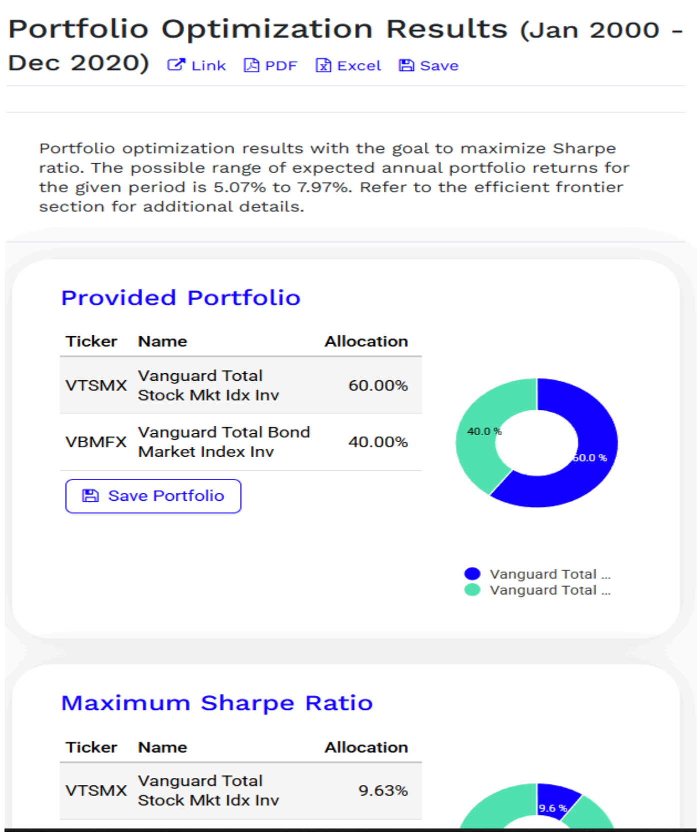


Portfolio Optimization Configuration

Portfolio Type	Tickers
Time Period	Year-to-Year
Start Year	2000
End Year	2020
Optimization Goal	Mean Variance - Maximize Sharpe Ratic
Robust Optimization	No
Use Historical Returns	Yes
Asset Constraints	Yes
Group Constraints	No
Compared Allocation	None
Benchmark	None

Portfolio Assets		Allocation	Min. Weight	Max. Weight
1	Vanguard To'	60 %	0 %	100 %
2	Vanguard To'	40 %	0 %	100 %

- **Result (Output Screenshot):**



Portfolio Optimization Results (Jan 2000 - Dec 2020)

Link PDF Excel Save

Portfolio optimization results with the goal to maximize Sharpe ratio. The possible range of expected annual portfolio returns for the given period is 5.07% to 7.97%. Refer to the efficient frontier section for additional details.

Provided Portfolio

Ticker	Name	Allocation
VTSMX	Vanguard Total Stock Mkt Idx Inv	60.00%
VBMFX	Vanguard Total Bond Market Index Inv	40.00%

Save Portfolio

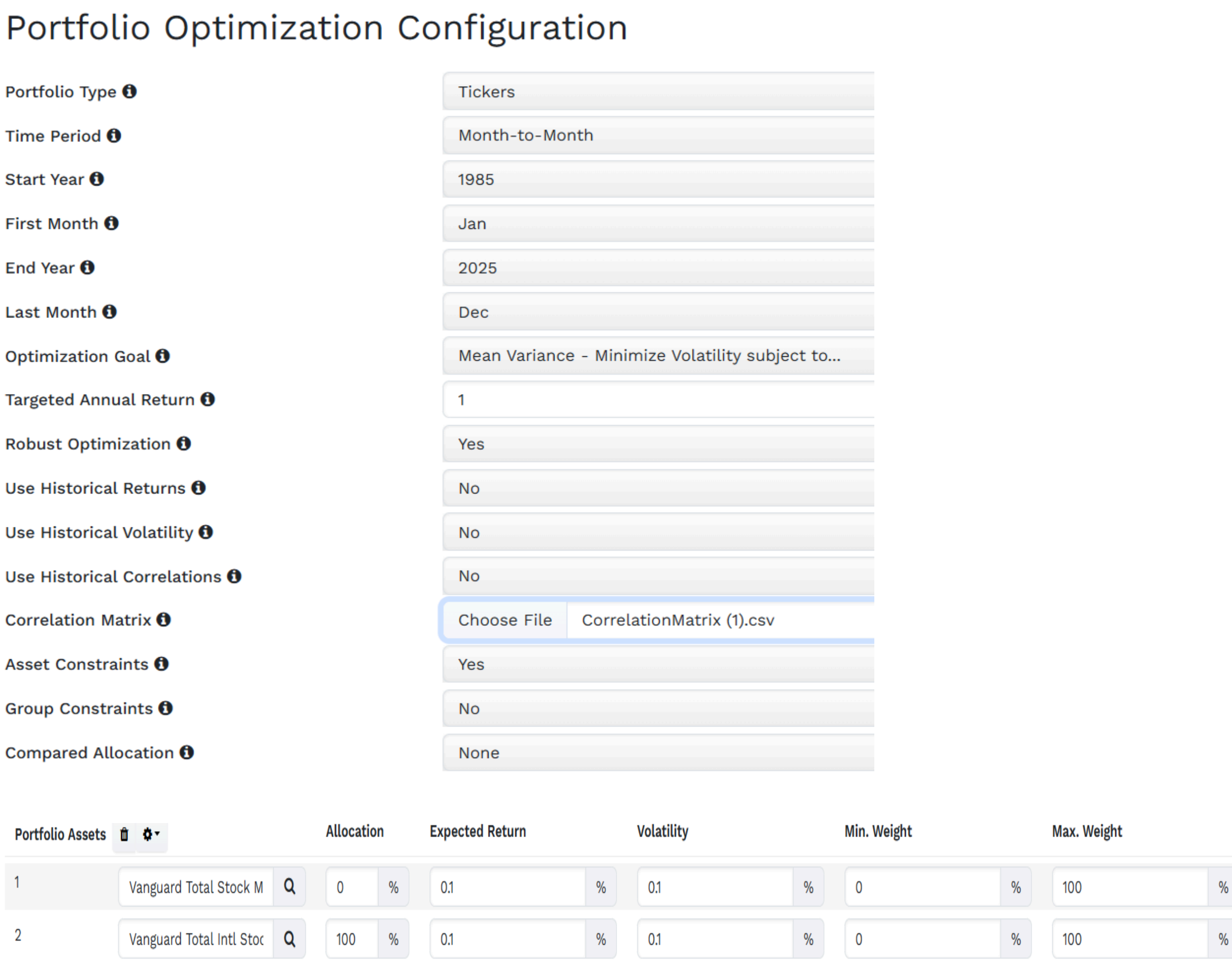
Maximum Sharpe Ratio

Ticker	Name	Allocation
VTSMX	Vanguard Total Stock Mkt Idx Inv	9.63%

- **Notes:Worked as expected.**

- ## TC ID: TC-PO02

- **Form Filled (Input Screenshot):**

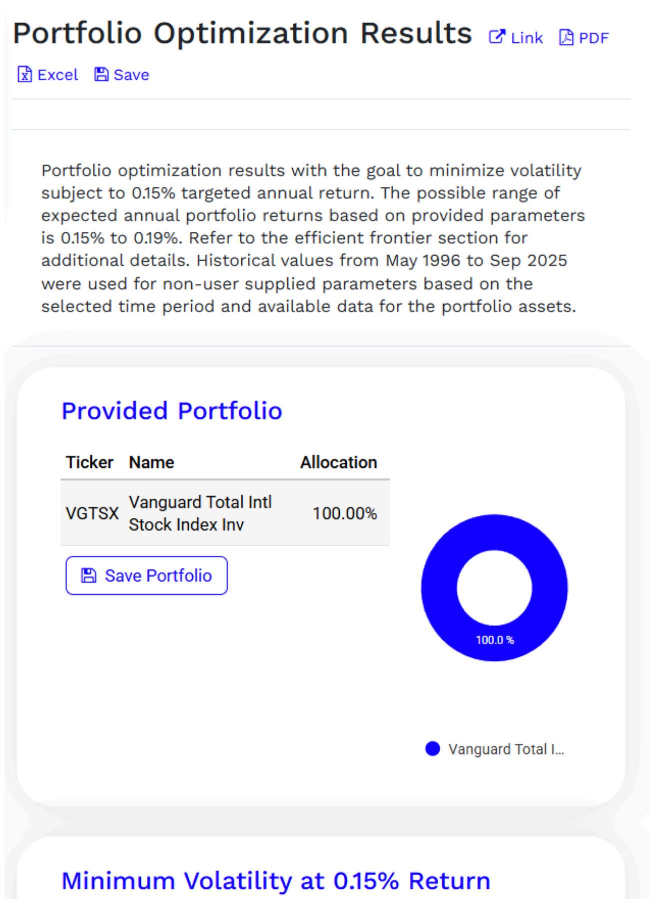


Portfolio Optimization Configuration

Portfolio Type	Tickers
Time Period	Month-to-Month
Start Year	1985
First Month	Jan
End Year	2025
Last Month	Dec
Optimization Goal	Mean Variance - Minimize Volatility subject to...
Targeted Annual Return	1
Robust Optimization	Yes
Use Historical Returns	No
Use Historical Volatility	No
Use Historical Correlations	No
Correlation Matrix	Choose File CorrelationMatrix (1).csv
Asset Constraints	Yes
Group Constraints	No
Compared Allocation	None

Portfolio Assets		Allocation	Expected Return	Volatility	Min. Weight	Max. Weight
1	Vanguard Total Stock M	0 %	0.1 %	0.1 %	0 %	100 %
2	Vanguard Total Intl Stoc	100 %	0.1 %	0.1 %	0 %	100 %

- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-PO03**

- **Form Filled (Input Screenshot):**

Portfolio Type	Asset Classes
Time Period	Month-to-Month
Start Year	1988
First Month	Dec
End Year	2024
Last Month	Sep
Optimization Goal	CVaR - Maximize Return subject to...
Targeted Monthly CVaR	0.15 %
Asset Constraints	No
Compared Allocation	Maximum Sharpe Ratio Weights
Benchmark	Vanguard 500 Index Investor
Show Regime Performan	Market Volatility

Asset Allocation		Allocation
1	US Mid Cap Gı	2 %
2	International ε	98 %

- **Result (Output Screenshot):**

Portfolio Optimization Results (Jan 1995 - Sep 2024) Link PDF Excel Save

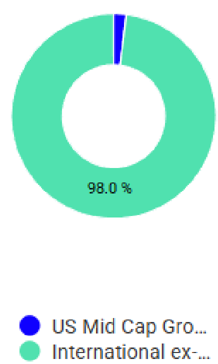
> **Note:** The time period was constrained by the available data for International ex-US Value [Jan 1995 - Sep 2025].

Portfolio optimization results with the goal to maximize return subject to 0.15% targeted monthly CVaR. The possible range of expected annual portfolio returns for the given period is 8.72% to 11.82%. Refer to the efficient frontier section for additional details.

Provided Portfolio

Asset Class	Allocation
US Mid Cap Growth	2.00%
International ex-US Value	98.00%

Save Portfolio

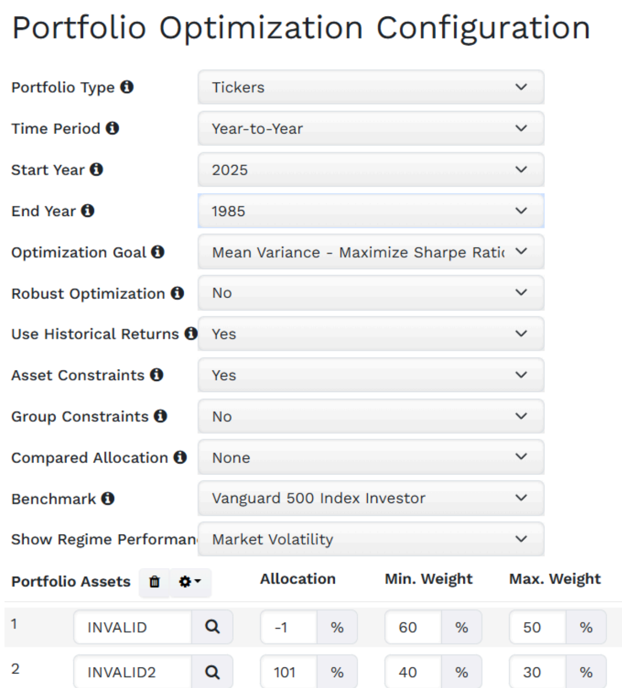


Maximum Return at 0.15% Expected Tail Loss

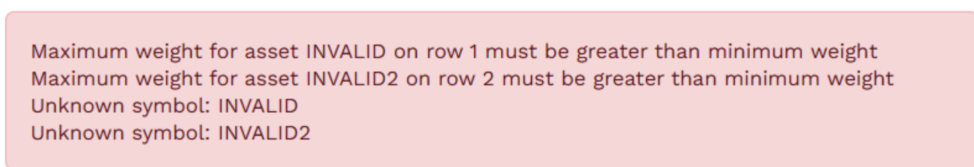
- **Notes:Worked as expected.**

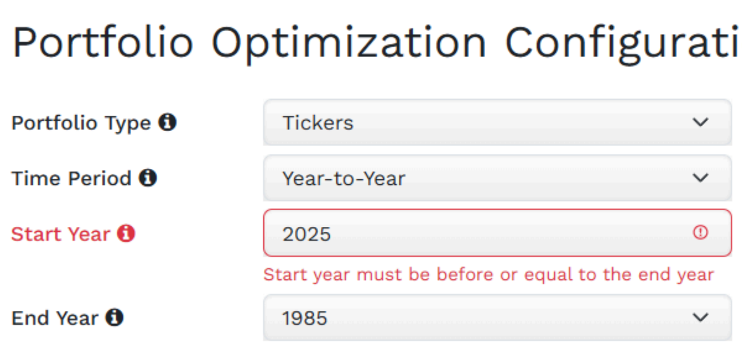
- **TC ID: TC-PO04**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**

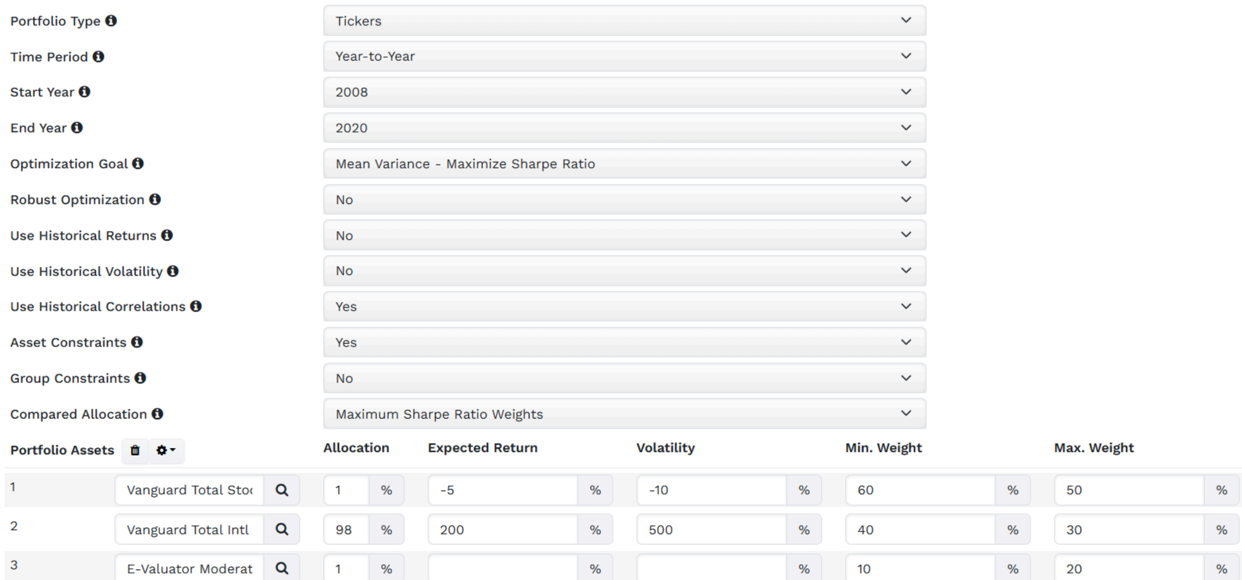




- **Notes:Worked as expected.**

- **TC ID: TC-PO05**

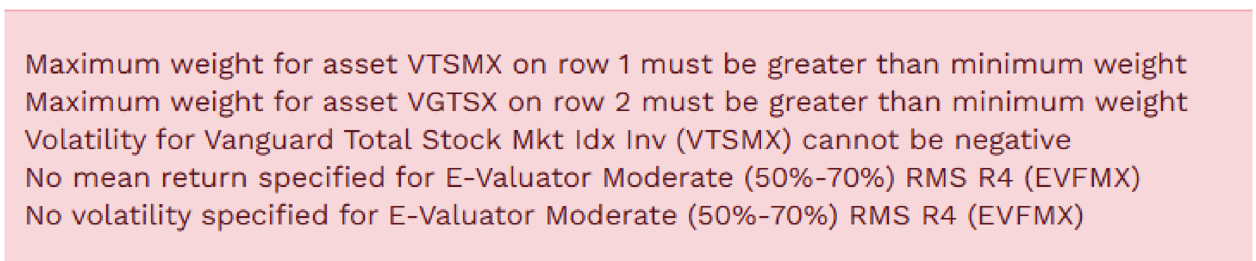
- **Form Filled (Input Screenshot):**



Portfolio Type	Tickers
Time Period	Year-to-Year
Start Year	2008
End Year	2020
Optimization Goal	Mean Variance - Maximize Sharpe Ratio
Robust Optimization	No
Use Historical Returns	No
Use Historical Volatility	No
Use Historical Correlations	Yes
Asset Constraints	Yes
Group Constraints	No
Compared Allocation	Maximum Sharpe Ratio Weights

Portfolio Assets		Allocation	Expected Return	Volatility	Min. Weight	Max. Weight
1	Vanguard Total Stoc	1 %	-5 %	-10 %	60 %	50 %
2	Vanguard Total Intl	98 %	200 %	500 %	40 %	30 %
3	E-Valuator Moderat	1 %	%	%	10 %	20 %

- **Result (Output Screenshot):**

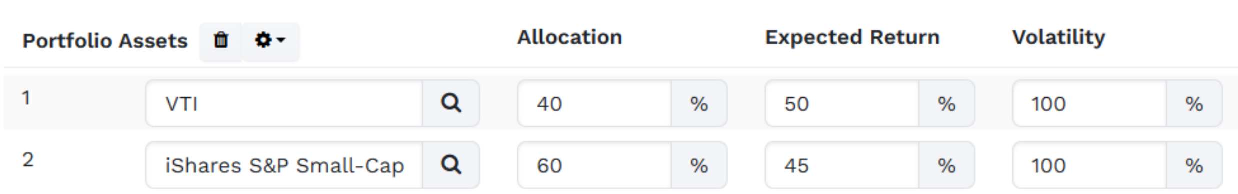


Maximum weight for asset VTSMX on row 1 must be greater than minimum weight
Maximum weight for asset VGTSX on row 2 must be greater than minimum weight
Volatility for Vanguard Total Stock Mkt Idx Inv (VTSMX) cannot be negative
No mean return specified for E-Valuator Moderate (50%-70%) RMS R4 (EVFMX)
No volatility specified for E-Valuator Moderate (50%-70%) RMS R4 (EVFMX)

- **Notes:Worked as expected.**

- ## TC ID: TC-PO06

- **Form Filled (Input Screenshot):**



Portfolio Assets		Allocation	Expected Return	Volatility
1	VTI	40 %	50 %	100 %
2	iShares S&P Small-Cap	60 %	45 %	100 %

- **Result (Output Screenshot):**

Portfolio Optimization Results

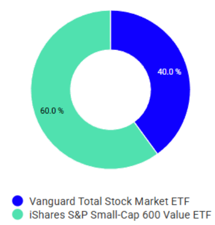
Link PDF Excel Save

Portfolio optimization results with the goal to maximize Sharpe ratio. The possible range of expected annual portfolio returns based on provided parameters is 47.44% to 48.35%. Refer to the efficient frontier section for additional details. Historical values from Jan 2006 to Sep 2025 were used for non-user supplied parameters based on the selected time period and available data for the portfolio assets.

Provided Portfolio

Ticker	Name	Allocation
VTI	Vanguard Total Stock Market ETF	40.00%
IJS	iShares S&P Small-Cap 600 Value ETF	60.00%

Save Portfolio



- **Notes:Worked as expected.**

- **TC ID: TC-PO07**

- **Form Filled (Input Screenshot):**

Portfolio Optimization Configuration

Portfolio Type	Tickers
Time Period	Year-to-Year
Start Year	2006
End Year	2025
Optimization Goal	Mean Variance - Maximize Sharpe Ratio
Robust Optimization	Yes
Use Historical Returns	No
Use Historical Volatility	No
Use Historical Correlations	Yes
Asset Constraints	No
Group Constraints	No
Compared Allocation	Maximum Sharpe Ratio Weights

Portfolio Assets		Allocation	Expected Return	Volatility
1	VTI	40 %	0.1 %	0.1 %
2	iShares S&P Small-Cap	60 %	0.2 %	0.1 %

- **Result (Output Screenshot):**

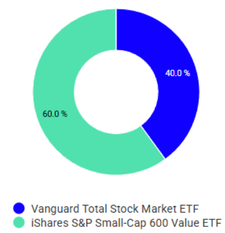
Portfolio Optimization Results
Link PDF Excel Save

Portfolio optimization results with the goal to maximize Sharpe ratio. The possible range of expected annual portfolio returns based on provided parameters is 0.15% to 0.19%. Refer to the efficient frontier section for additional details. Historical values from Jan 2006 to Sep 2025 were used for non-user supplied parameters based on the selected time period and available data for the portfolio assets.

Provided Portfolio

Ticker	Name	Allocation
VTI	Vanguard Total Stock Market ETF	40.00%
IJS	iShares S&P Small-Cap 600 Value ETF	60.00%

Save Portfolio



- **Notes:Worked as expected.**

- **TC ID: TC-MCS01**

- **Form Filled (Input Screenshot):**

Simulation Model Configuration

Portfolio Type	Tickers
Initial Amount	1000000 .00
Cashflows	Withdraw fixed amount periodically
Withdrawal Amount	45000 .00
Inflation Adjusted	Yes
Withdrawal Frequency	Annually
Simulation Period in Year	30
Tax Treatment	Pre-tax Returns
Simulation Model	Historical Returns
Use Full History	Yes
Bootstrap Model	Single Year
Sequence of Returns Risl	No Adjustments
Inflation Model	Historical Inflation
Rebalancing	Rebalance annually
Intervals	Defaults
Fee Structure	None

Portfolio Assets		Allocation
Asset 1	Vanguard Total Stock Market ETF (VTI)	60 %
Asset 2	Vanguard Total Bond Market ETF (BND)	40 %

- **Result (Output Screenshot):**

Monte Carlo Simulation Results

Link PDF

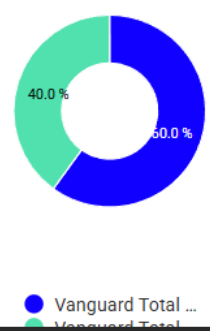
Excel Save

Monte Carlo simulation results for 10000 portfolios with $1,000,000 initial portfolio balance using available historical returns data from Jan 2008 to Dec 2024 with annual sampling. The historical pre-tax return for the selected portfolio for this period was 8.51% mean return (7.81% CAGR) with 10.40% standard deviation of annual returns. The simulation results are based on generated nominal returns and specified inflation adjusted withdrawals ($45,000 per year). The simulated inflation model used historical inflation with 2.43% mean and 1.36% standard deviation based on the Consumer Price Index (CPI-U) data from Jan 2008 to Dec 2024. The generated inflation samples were correlated with simulated asset returns based on historical correlations. The available historical data for the simulation inputs was constrained by Vanguard Total Bond Market ETF (BND) [May 2007 - Sep 2025].

Portfolio Model

Ticker	Name	Allocation
VTI	Vanguard Total Stock Market ETF	60.00%
BND	Vanguard Total Bond Market ETF	40.00%

Save Portfolio



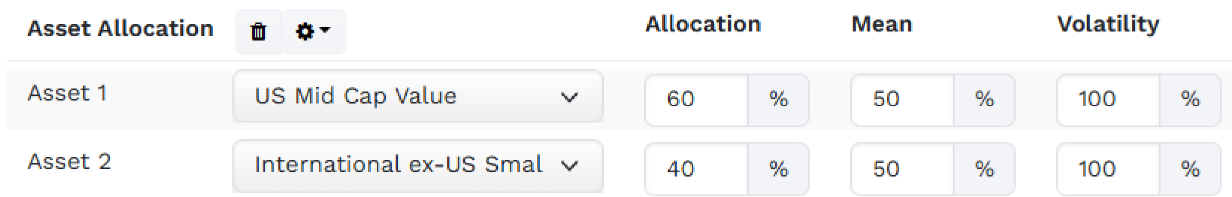
- **Notes:Worked as expected.**

- **TC ID: TC-MCS02**

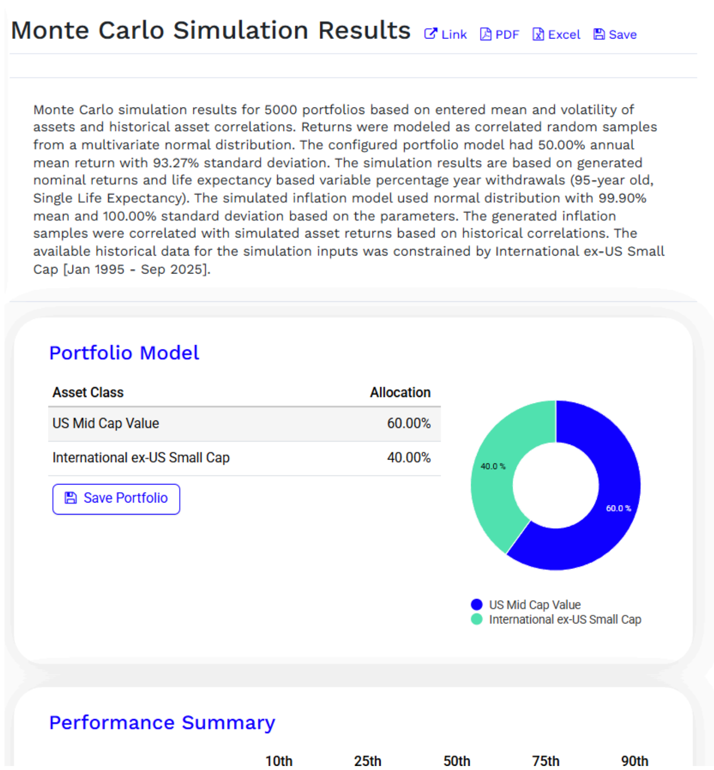
- **Form Filled (Input Screenshot):**

Simulation Model Configuratic

Portfolio Type	Asset Classes
Initial Amount	10000000 .00
Cashflows	Withdraw based on life expectai
Withdrawal Frequenc	Annually
Life Expectancy Mode	Single Life Expectancy
Current Age	95
Simulation Period in Y	75
Tax Treatment	Pre-tax Returns
Simulation Model	Forecasted Returns
Time Series Model	Normal Returns
Risk-Free Rate	50.0 %
Use Historical Volatili	No
Use Historical Correla	Yes
Sequence of Returns	No Adjustments
Inflation Model	Parameterized Inflation
Inflation Mean	99.9 %
Inflation Volatility	100.0 %
Rebalancing	Rebalance annually
Intervals	Defaults
Fee Structure	None



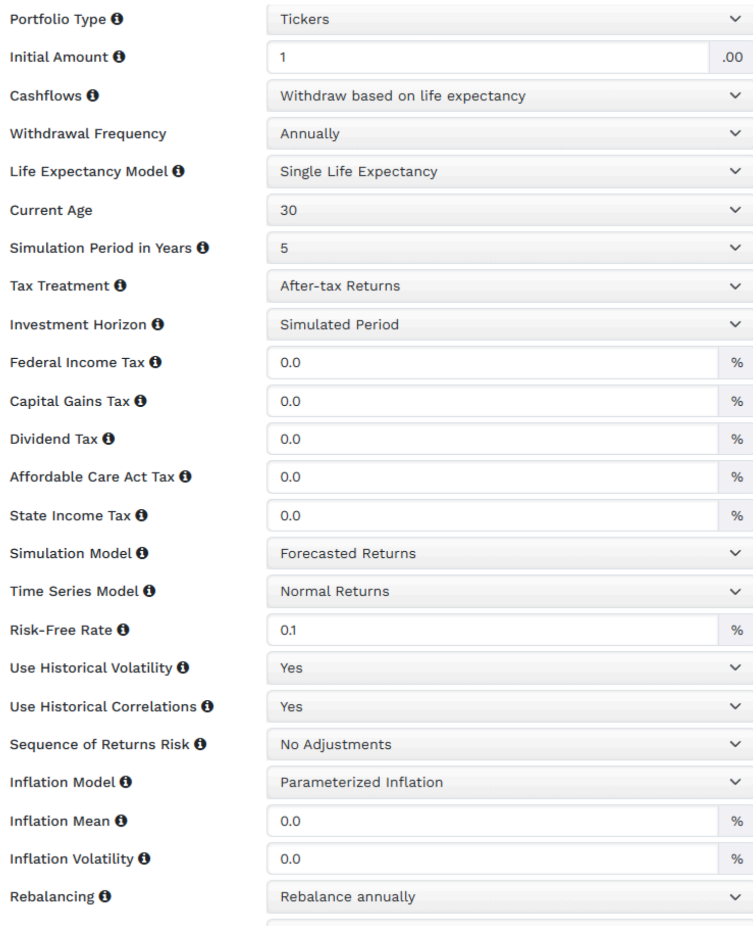
- **Result (Output Screenshot):**

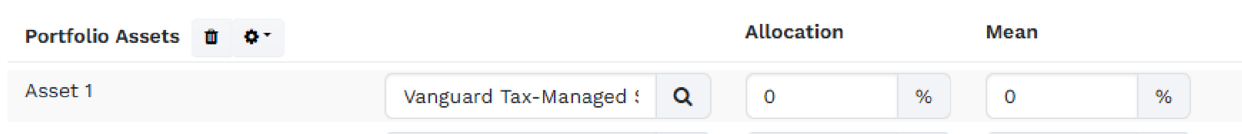


- **Notes:Worked as expected.**

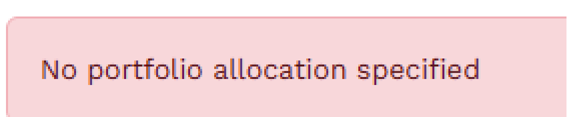
- **TC ID: TC-MCS03**

- **Form Filled (Input Screenshot):**





- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-MCS05**

- **Form Filled (Input Screenshot):**

Simulation Model Configuration

Portfolio Type	Tickers
Initial Amount	1 .00
Cashflows	No contributions or withdrawals
Simulation Period in Years	5
Tax Treatment	Pre-tax Returns
Simulation Model	Parameterized Returns
Risk-Free Rate	0.1 %
Distribution	Normal Distribution
Expected Return	7.0 %
Volatility	12.0 %
Sequence of Returns Risk	No Adjustments
Inflation Model	Parameterized Inflation
Inflation Mean	4.0 %
Inflation Volatility	3.0 %
Intervals	Custom
Percentile Intervals	10, 25, 50, 75, 90 th
Return Intervals	0, 2.5, 5, 7.5, 10, 12.5 %
Fee Structure	None

Run Simulation   Cancel

- **Result (Output Screenshot):**

Monte Carlo Simulation Results

Link PDF Excel Save

Monte Carlo simulation results for 10000 portfolios with $1.00 initial portfolio balance using the normal distribution with 7.00% mean and 12.00% standard deviation for annual returns. The simulated inflation model used normal distribution with 4.00% mean and 3.00% standard deviation based on the parameters. The generated inflation samples were uncorrelated with simulated asset returns.

Performance Summary

	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
Time Weighted Rate of Return (nominal)	-0.42%	2.63%	6.26%	10.04%	13.33%
Time Weighted Rate of Return (real)	-4.45%	-1.46%	2.16%	5.89%	9.30%
Portfolio End Balance (nominal)	$0.98	$1.14	$1.35	$1.61	$1.87
Portfolio End Balance (real)	$0.80	$0.93	$1.12	$1.33	$1.56
Annual Mean Return (nominal)	0.07%	3.14%	6.78%	10.60%	13.95%
Annualized Volatility	9.90%	10.48%	11.17%	11.87%	12.50%
Sharpe Ratio	0.01	0.28	0.59	0.91	1.19
Sortino Ratio	0.01	0.42	0.98	1.63	2.30
Maximum Drawdown	-25.47%	-19.96%	-15.11%	-11.64%	-9.32%
Safe Withdrawal Rate	17.03%	18.98%	21.31%	23.87%	26.48%
Perpetual Withdrawal Rate	0.00%	0.00%	2.18%	5.61%	8.55%

- **Notes:Worked as expected.**

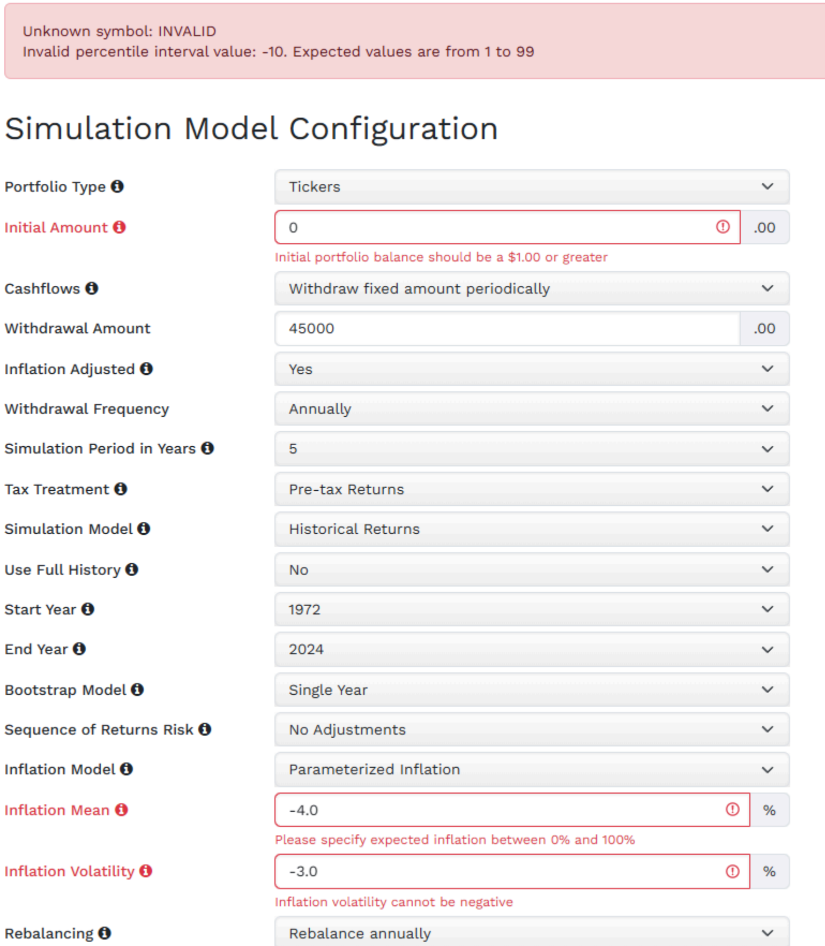
- ## TC ID: TC-MCS06

- **Form Filled (Input Screenshot):**

Portfolio Type	Tickers	
Initial Amount	0	.00
Cashflows	Withdraw fixed amount periodically	
Withdrawal Amount	1-1-000001001111000000.11220410042109	.00
Inflation Adjusted	Yes	
Withdrawal Frequency	Annually	
Simulation Period in Years	5	
Tax Treatment	Pre-tax Returns	
Simulation Model	Historical Returns	
Use Full History	No	
Start Year	1972	
End Year	2024	
Bootstrap Model	Single Year	
Sequence of Returns Risk	No Adjustments	
Inflation Model	Parameterized Inflation	
Inflation Mean	-4.0	%
Inflation Volatility	-3.0	%
Rebalancing	Rebalance annually	
Intervals	Custom	
Percentile Intervals	-10, 25, 50, 75, 90	th
Return Intervals	0, 2.5, 5, 7.5, 10, 12.5	%
Fee Structure	None	

Portfolio Assets		Allocation
Asset 1	INVALID	-10 %

- **Result (Output Screenshot):**


Unknown symbol: INVALID
Invalid percentile interval value: -10. Expected values are from 1 to 99

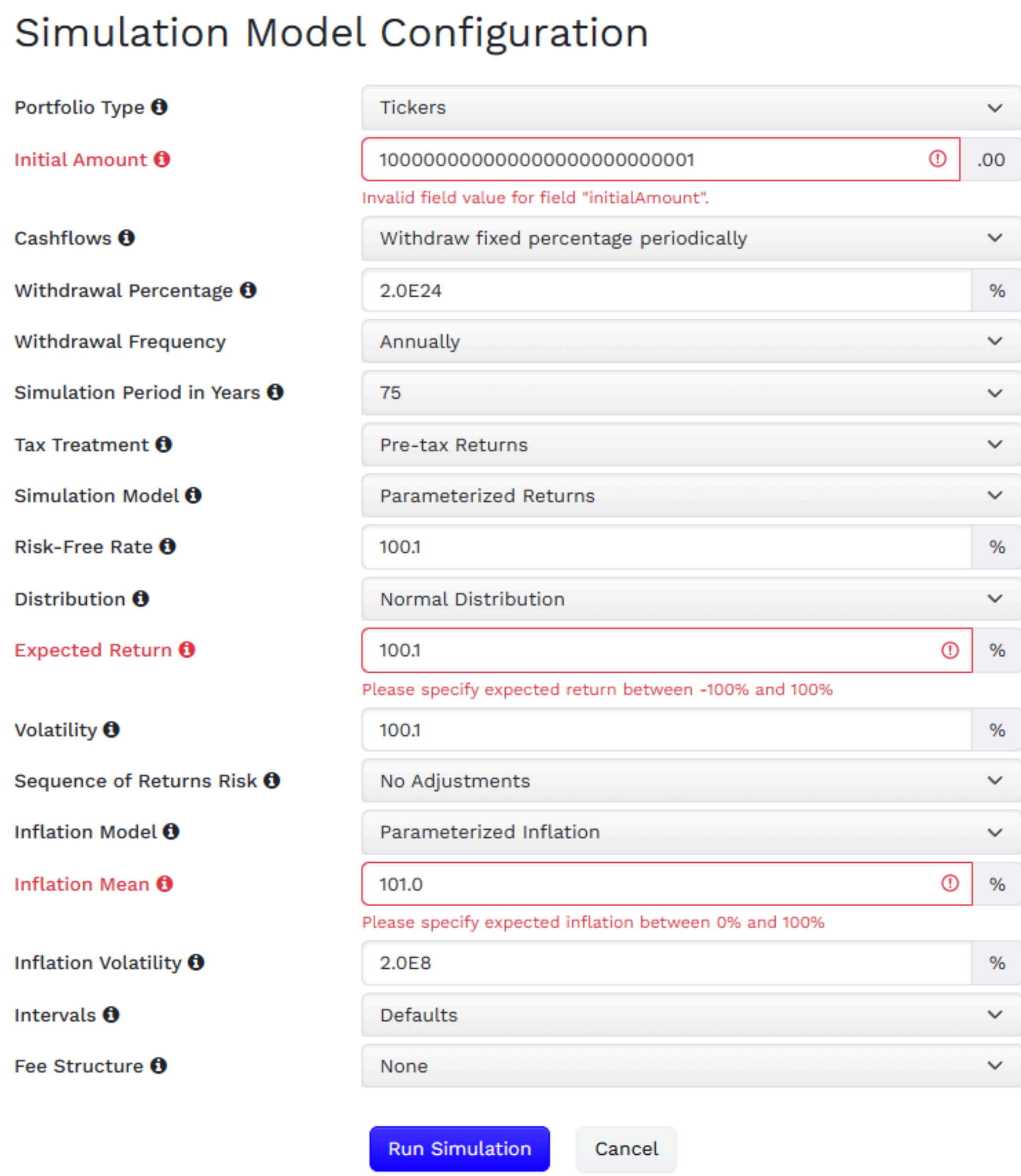
Simulation Model Configuration

Portfolio Type	Tickers
Initial Amount	0 .00
	Initial portfolio balance should be a $1.00 or greater
Cashflows	Withdraw fixed amount periodically
Withdrawal Amount	45000 .00
Inflation Adjusted	Yes
Withdrawal Frequency	Annually
Simulation Period in Years	5
Tax Treatment	Pre-tax Returns
Simulation Model	Historical Returns
Use Full History	No
Start Year	1972
End Year	2024
Bootstrap Model	Single Year
Sequence of Returns Risk	No Adjustments
Inflation Model	Parameterized Inflation
Inflation Mean	-4.0 %
	Please specify expected inflation between 0% and 100%
Inflation Volatility	-3.0 %
	Inflation volatility cannot be negative
Rebalancing	Rebalance annually

- **Notes:Worked as expected.**

- **TC ID: TC-MCS07**

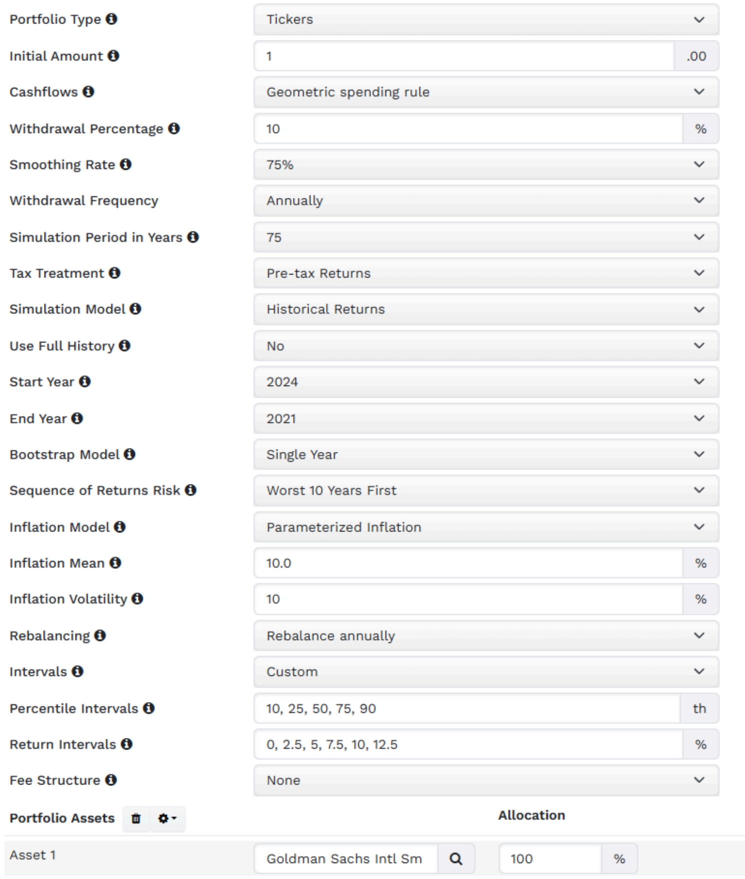
- **Form Filled (Input Screenshot):**



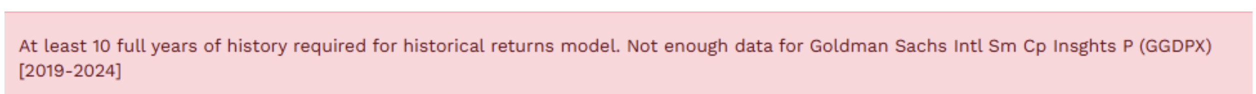
- **Notes:INTERESTING NOTE ,WITHDRAWAL PERCENTAGE IS SET VERY HIGH IN EXPONENTIAL AND IT STILL DOESNT GIVE ERROR ON THAT, SIMILARLY, INFLATION MEAN IS SET TO EXPONENTIAL POWERS MEANING THE FORM IS ACCEPTING THOSE VALUES.**

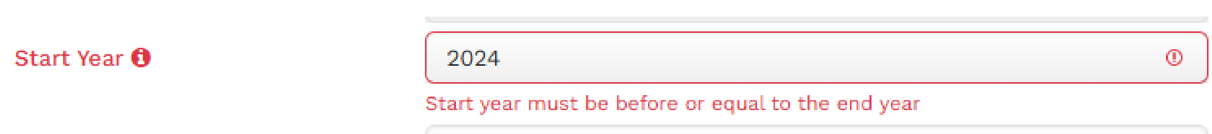
- ## TC ID: TC-MCS08

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**

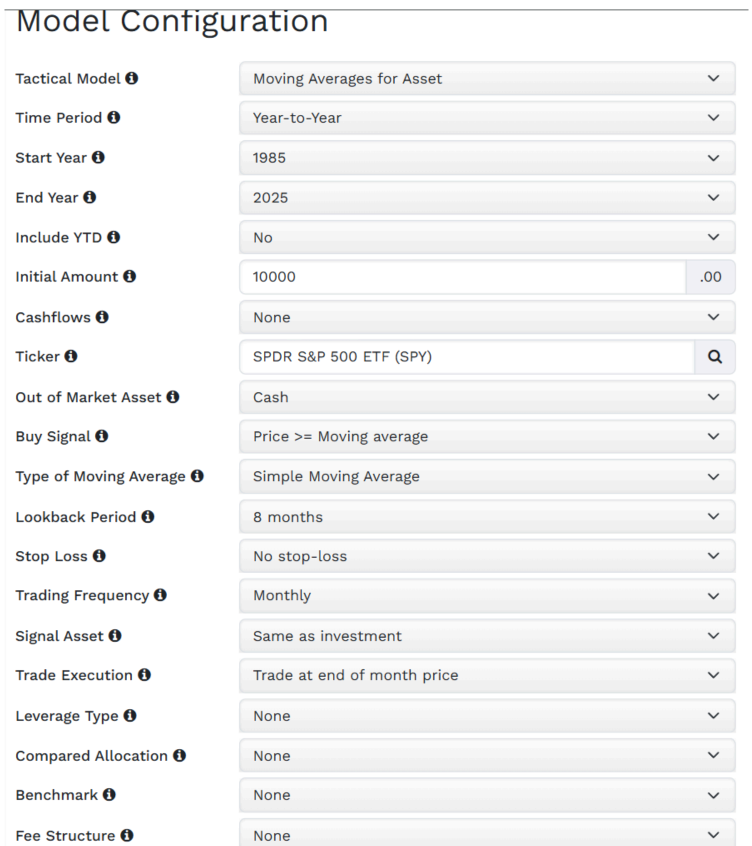




- **Notes:Worked as expected.**

- **TC ID: TC-TAA01**

- **Form Filled (Input Screenshot):**



Model Configuration

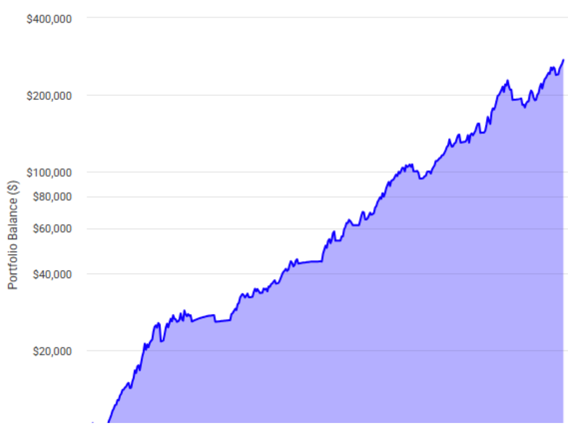
Tactical Model	Moving Averages for Asset
Time Period	Year-to-Year
Start Year	1985
End Year	2025
Include YTD	No
Initial Amount	10000 .00
Cashflows	None
Ticker	SPDR S&P 500 ETF (SPY)
Out of Market Asset	Cash
Buy Signal	Price >= Moving average
Type of Moving Average	Simple Moving Average
Lookback Period	8 months
Stop Loss	No stop-loss
Trading Frequency	Monthly
Signal Asset	Same as investment
Trade Execution	Trade at end of month price
Leverage Type	None
Compared Allocation	None
Benchmark	None
Fee Structure	None

- **Result (Output Screenshot):**

Performance Summary

Metric	Moving Average Model
Start Balance	$10,000
End Balance	$273,693
Annualized Return (CAGR)	10.99%
Standard Deviation	10.51%
Best Year	37.88%
Worst Year	-19.95%
Maximum Drawdown	-21.69%
Sharpe Ratio	0.82
Sortino Ratio	1.31

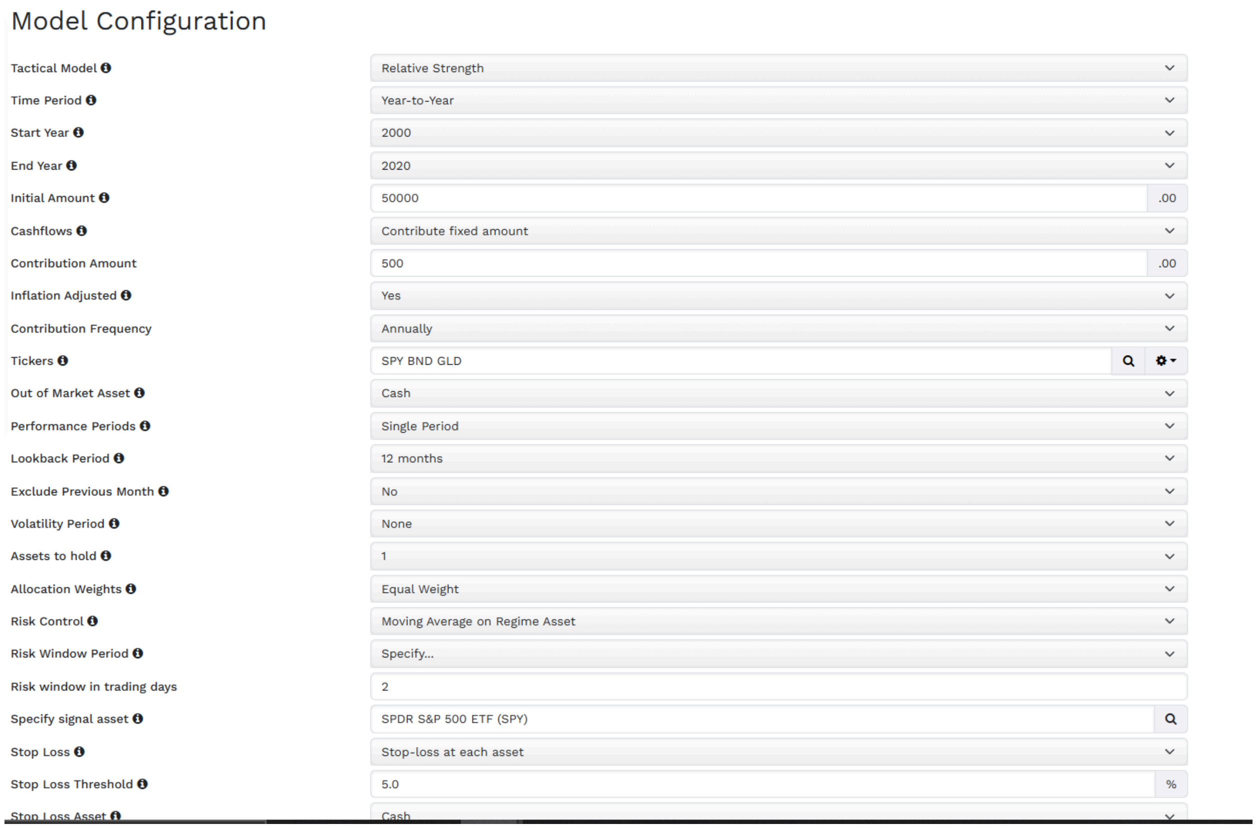
Portfolio Growth



- **Notes:Worked as expected.**

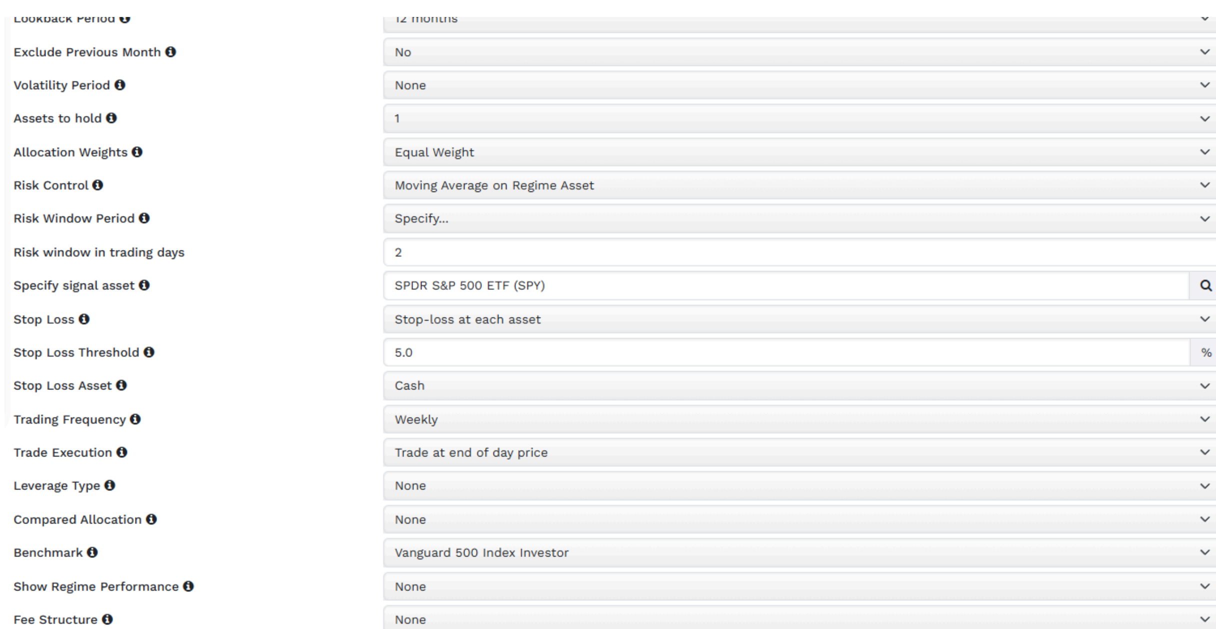
- **TC ID: TC-TAA02**

- **Form Filled (Input Screenshot):**



Model Configuration

Tactical Model	Relative Strength
Time Period	Year-to-Year
Start Year	2000
End Year	2020
Initial Amount	50000 .00
Cashflows	Contribute fixed amount
Contribution Amount	500 .00
Inflation Adjusted	Yes
Contribution Frequency	Annually
Tickers	SPY BND GLD
Out of Market Asset	Cash
Performance Periods	Single Period
Lookback Period	12 months
Exclude Previous Month	No
Volatility Period	None
Assets to hold	1
Allocation Weights	Equal Weight
Risk Control	Moving Average on Regime Asset
Risk Window Period	Specify...
Risk window in trading days	2
Specify signal asset	SPDR S&P 500 ETF (SPY)
Stop Loss	Stop-loss at each asset
Stop Loss Threshold	5.0 %
Stop Loss Asset	Cash



Lookback Period	12 months
Exclude Previous Month	No
Volatility Period	None
Assets to hold	1
Allocation Weights	Equal Weight
Risk Control	Moving Average on Regime Asset
Risk Window Period	Specify...
Risk window in trading days	2
Specify signal asset	SPDR S&P 500 ETF (SPY)
Stop Loss	Stop-loss at each asset
Stop Loss Threshold	5.0 %
Stop Loss Asset	Cash
Trading Frequency	Weekly
Trade Execution	Trade at end of day price
Leverage Type	None
Compared Allocation	None
Benchmark	Vanguard 500 Index Investor
Show Regime Performance	None
Fee Structure	None

- **Result (Output Screenshot):**

Performance Summary

Metric	Momentum Model	Vanguard 500 Index Investor
Start Balance	$50,000	$50,000
End Balance	$83,643	$278,320
Annualized Return (CAGR)	4.38%	15.38%
Time-Weighted Rate of Return (TWRR)	3.53%	14.84%
Money-Weighted Rate of Return (MWRR)	3.49%	14.82%
Standard Deviation	10.28%	14.84%
Best Year	25.35%	32.18%
Worst Year	-15.55%	-4.52%
Maximum Drawdown	-27.34%	-19.63%
Max. Drawdown (excluding cashflows)	-28.36%	-19.63%
Sharpe Ratio	0.34	0.98
Sortino Ratio	0.49	1.58
Benchmark Correlation	0.38	1.00

Portfolio Growth

- **Notes:Worked as expected.**

- **TC ID: TC-TAA03**

- **Form Filled (Input Screenshot):**

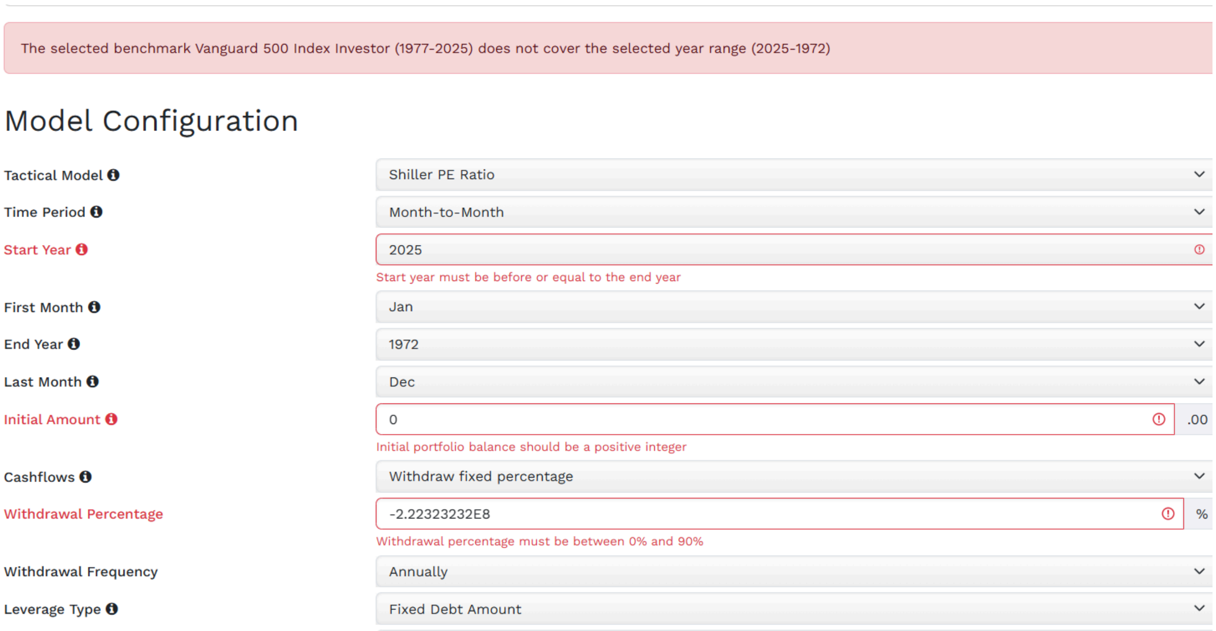
Model Configuration

Tactical Model	Shiller PE Ratio
Time Period	Month-to-Month
Start Year	2025
First Month	Jan
End Year	1972
Last Month	Dec
Initial Amount	0
Cashflows	Withdraw fixed percentage
Withdrawal Percentage	101.1
Withdrawal Frequency	Annually
Leverage Type	Fixed Debt Amount
Debt Amount	3-500-200102123131231313
Debt Interest	-1332131
Maintenance Margin	-2323232
Leveraged Benchmark	Yes
Compared Allocation	None
Benchmark	Vanguard 500 Index Investor
Show Regime Performance	None
Fee Structure	None

- **Result (Output Screenshot):**

Debt interest rate cannot be negative

Maintenance margin cannot be negative



- **Notes:Worked as expected.**

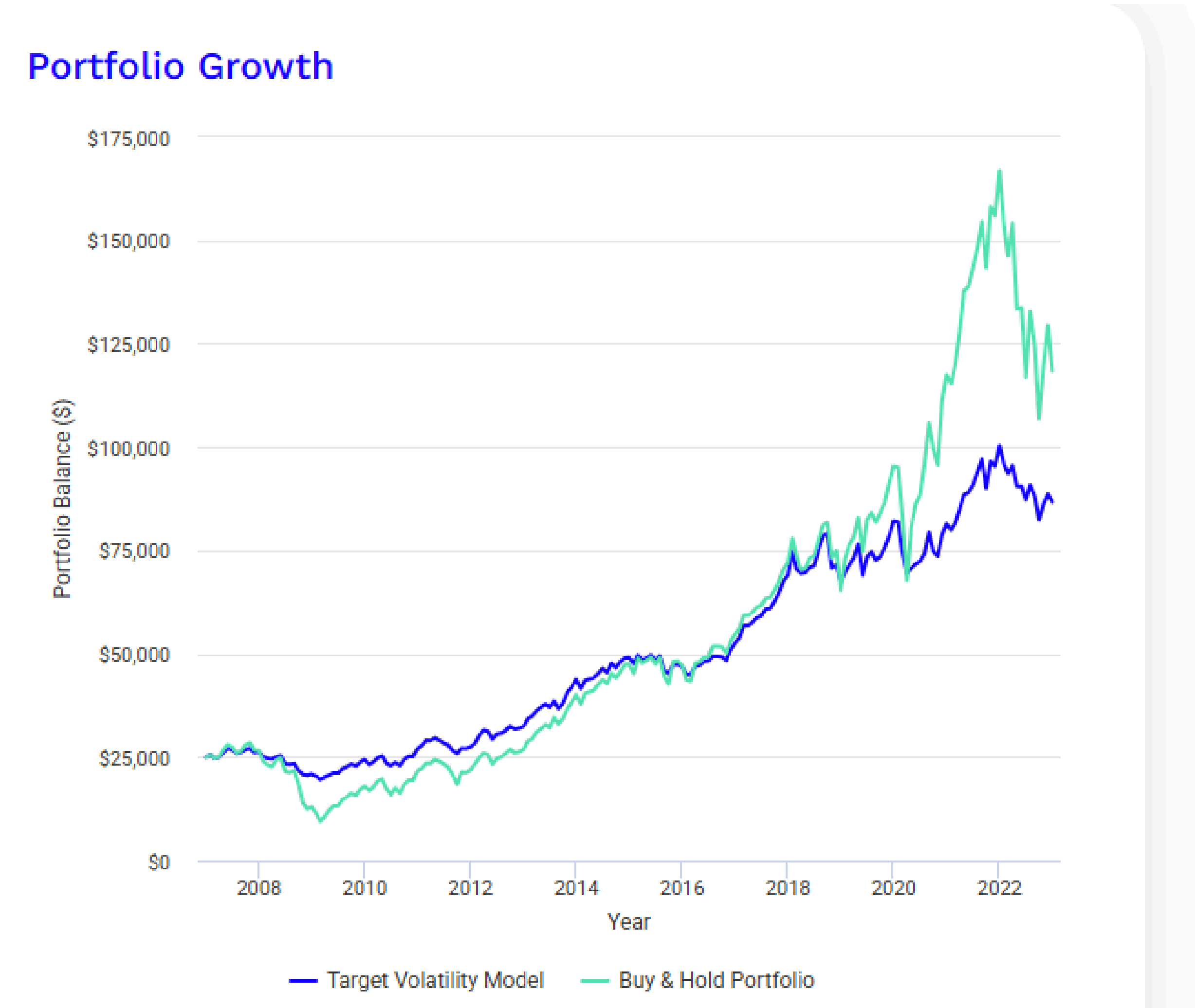
- **TC ID: TC-TAA04**

- **Form Filled (Input Screenshot):**

Tactical Model	Target Volatility
Time Period	Year-to-Year
Start Year	2007
End Year	2022
Initial Amount	25000 .00
Cashflows	Contribute fixed amount
Contribution Amount	300 .00
Inflation Adjusted	Yes
Contribution Frequency	Annually
Target Volatility	9.0 %
Use Downside Volatility	No
Out of Market Asset	Cash
Volatility Periods	Single Period
Volatility Period	1 month
Trade Execution	Trade at end of month price
Leverage Type	Fixed Leverage Ratio
Leverage Ratio	50.0 %
Debt Interest	5 %
Leveraged Benchmark	Yes
Compared Allocation	Default
Benchmark	None
Fee Structure	None

Portfolio Assets		Allocation
Asset 1	SPDR S&P 500 ET	100 %

- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-TAA05**

- **Form Filled (Input Screenshot):**

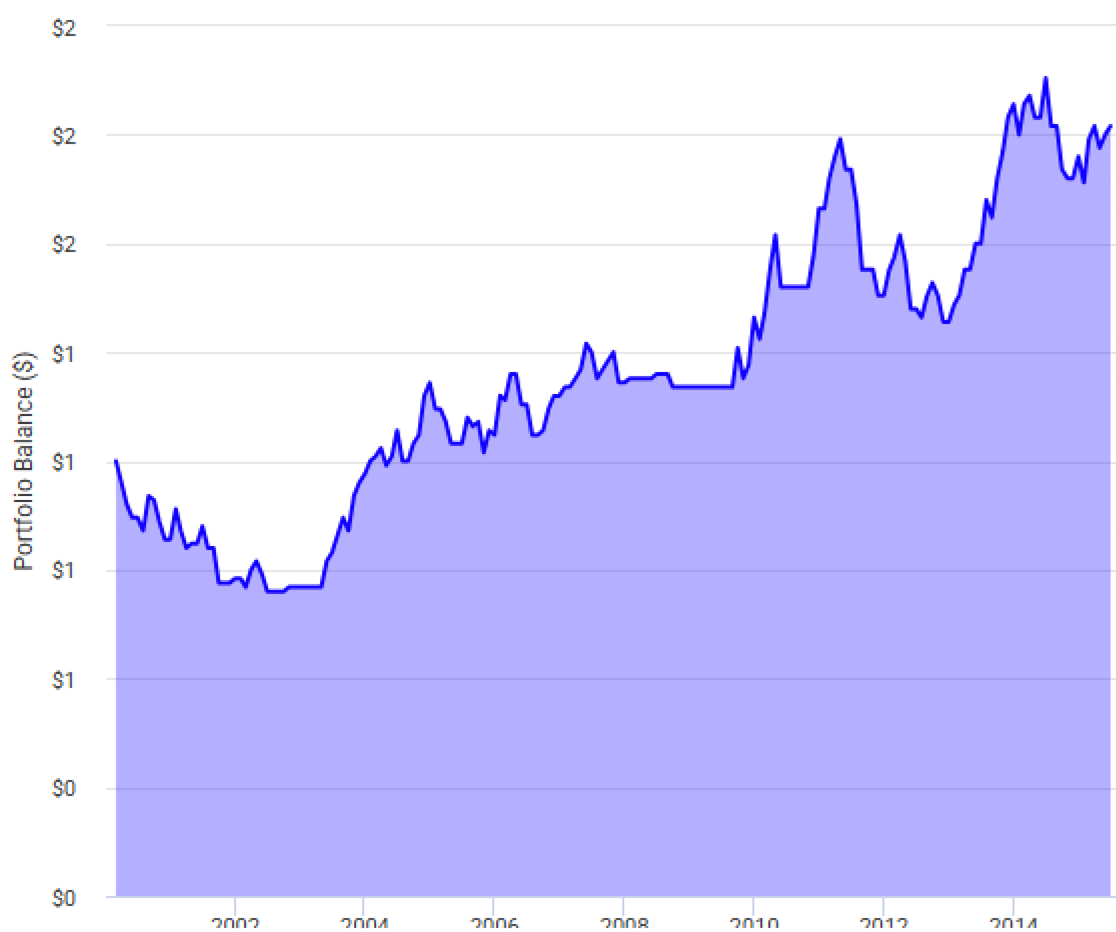
Model Configuration

Tactical Model	Moving Averages for Asset
Time Period	Month-to-Month
Start Year	1990
First Month	Jun
End Year	2015
Last Month	Jun
Calendar Aligned	Yes
Initial Amount	1 .00
Cashflows	None
Ticker	VIX
Out of Market Asset	Cash
Buy Signal	Price >= Moving average
Type of Moving Average	Exponential Moving Average
Lookback Period	10 months
Stop Loss	Stop-loss at portfolio level
Stop Loss Threshold	5.0 %
Stop Loss Asset	Cash
Trading Frequency	Bimonthly
Signal Asset	Same as investment
Trade Execution	Trade at next close price
Leverage Type	None
Compared Allocation	None
Benchmark	None

- **Result (Output Screenshot):**

Metric	Moving Average Model
Start Balance	$1.00
End Balance	$1.77
Annualized Return (CAGR)	3.78%
Standard Deviation	12.98%
Best Year	37.44%
Worst Year	-17.55%
Maximum Drawdown	-29.82%
Sharpe Ratio	0.21
Sortino Ratio	0.31

Portfolio Growth



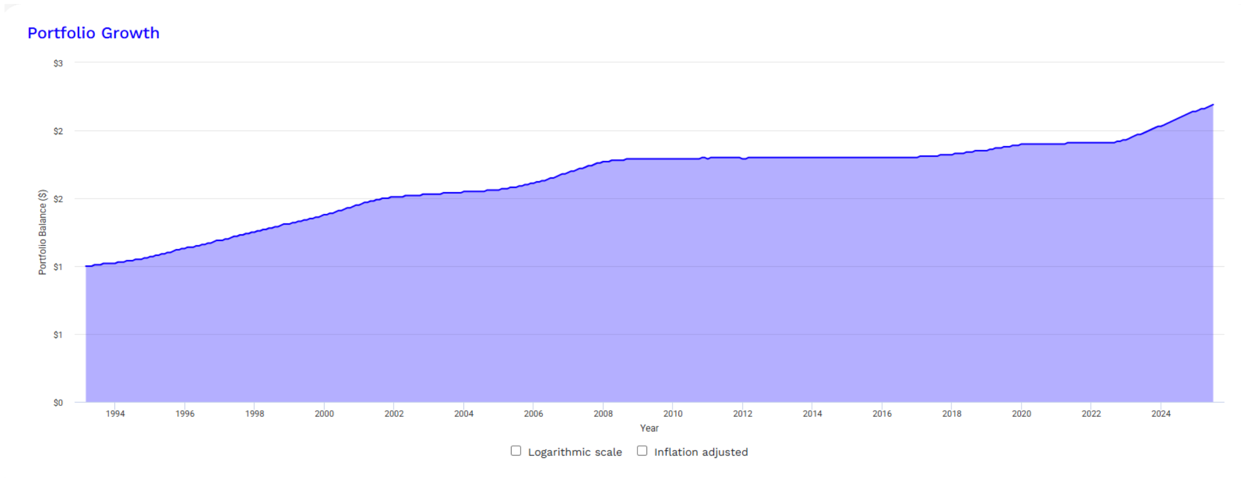
- **Notes:Worked as expected.**

- **TC ID: TC-TAA06**

- **Form Filled (Input Screenshot):**

Tactical Model	Target Volatility
Time Period	Month-to-Month
Start Year	1972
First Month	Jun
End Year	2025
Last Month	Jun
Calendar Aligned	Yes
Initial Amount	1
Cashflows	Withdraw fixed percentage
Withdrawal Percentage	0.1
Withdrawal Frequency	Annually
Target Volatility	0.1
Use Downside Volatility	No
Out of Market Asset	Cash
Volatility Periods	Single Period
Volatility Period	1 month
Trade Execution	Trade at next close price
Leverage Type	Fixed Leverage Ratio
Leverage Ratio	0.1
Debt Interest	0.1
Leveraged Benchmark	Yes
Compared Allocation	None
Benchmark	None
Fee Structure	None

- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- **TC ID: TC-TAA07**

- **Form Filled (Input Screenshot):**

Model Configuration

Tactical Model	Target Volatility
Time Period	Year-to-Year
Start Year	1972
End Year	2025
Include YTD	Yes
Initial Amount	99999999999999
Cashflows	Contribute fixed amount
Contribution Amount	99999999999999
Inflation Adjusted	Yes
Contribution Frequency	Annually
Target Volatility	50
Use Downside Volatility	No
Out of Market Asset	Cash
Volatility Periods	Single Period
Volatility Period	36 months
Trade Execution	Trade at next close price
Leverage Type	Fixed Leverage Ratio
Leverage Ratio	100
Debt Interest	25
Leveraged Benchmark	Yes
Compared Allocation	None
Benchmark	None
Fee Structure	None

Portfolio Assets		Allocation
Asset 1	SPDR S&P 500 ETF (SP\	100

- **Result (Output Screenshot):**

Performance Summary

Metric	Target Volatility Model
Start Balance	$99,999,999,999,999
End Balance	$3,126,470,713,473,773
Annualized Return (CAGR)	12.68%
Time-Weighted Rate of Return (TWRR)	-8.33%
Money-Weighted Rate of Return (MWRR)	-2.05%
Standard Deviation	30.73%
Best Year	35.76%
Worst Year	-71.85%
Maximum Drawdown	-72.84%
Max. Drawdown (excluding cashflows)	-97.50%
Sharpe Ratio	-0.19
Sortino Ratio	-0.24

Portfolio Growth

- **Notes:Worked as expected.**

CONFIG FORMS

- **TC ID: TC-ABF01**

- **Form Filled (Input Screenshot):**

Asset Backfill Configuration

Backfill Oldest Share Class: No

#	Asset Ticker	Backfill Ticker
1	Apple Inc (AAPL)	AAPLX
2	Asset symbol	Proxy symbol
3	Asset symbol	Proxy symbol
4	Asset symbol	Proxy symbol
5	Asset symbol	Proxy symbol
6	Asset symbol	Proxy symbol
7	Asset symbol	Proxy symbol
8	Asset symbol	Proxy symbol
9	Asset symbol	Proxy symbol
10	Asset symbol	Proxy symbol

- **Result (Output Screenshot):**

Changes saved successfully.

- **Notes:Worked as expected.**

- ## TC ID: TC-ABF02

- **Form Filled (Input Screenshot):**

Asset Backfill Configuration

Backfill Oldest Share Class: Yes

#	Asset Ticker	Backfill Ticker
1	Apple Inc (AAPL)	Apple Inc (AAPL)
2	Microsoft Corporation (MSFT)	MSFTX
3	SPDR Gold Shares (GLD)	GLDF
4	Vanguard Total Stock Market ETF (	VTIR
5	Alphabet Inc (GOOG)	Alphabet Inc (GOOG)
6	Tesla Inc (TSLA)	Transamerica Small Cap Value A (T
7	SPDR S&P 500 ETF (SPY)	SPDR S&P 500 ETF (SPY)
8	Vanguard Total Bond Market ETF (I	BNDA
9	Advanced Micro Devices Inc. (AMD	Advanced Micro Devices Inc. (AMD
10	Vanguard S&P 500 ETF (VOO)	VOOE

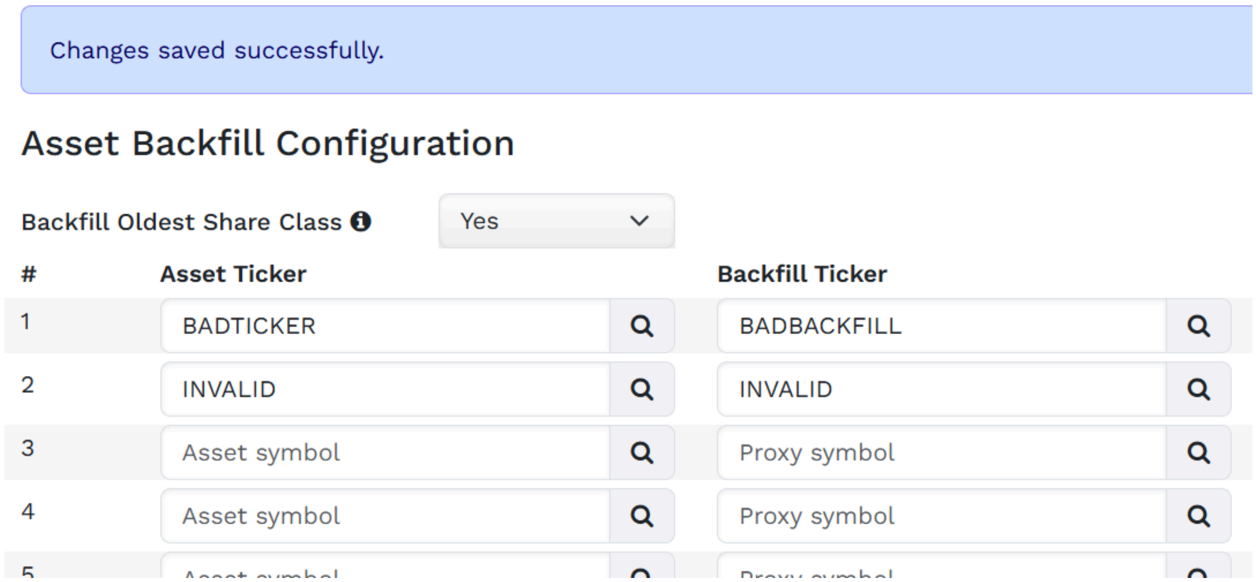
- **Result (Output Screenshot):**

Changes saved successfully.

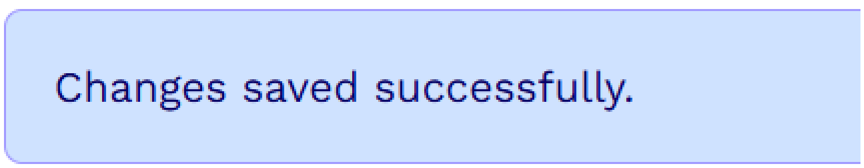
- **Notes:Worked as expected.**

- ## TC ID: TC-ABF03

- **Form Filled (Input Screenshot):**



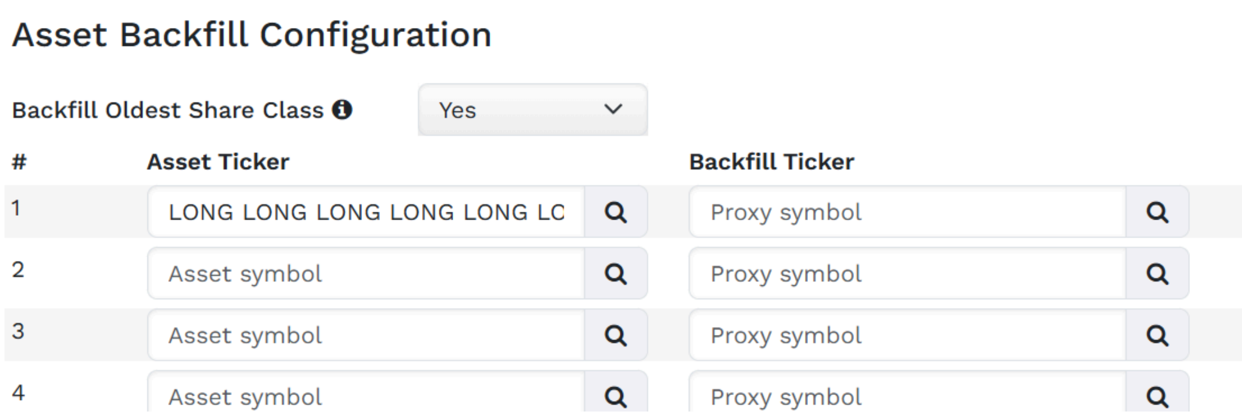
- **Result (Output Screenshot):**



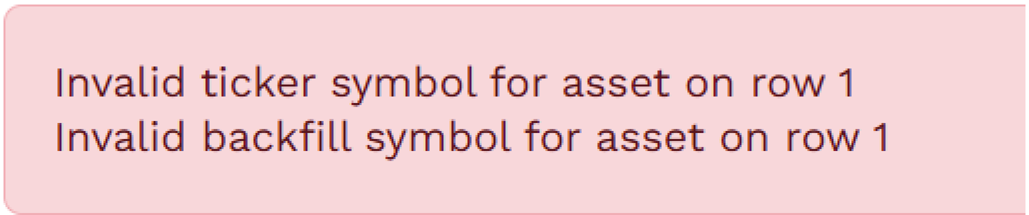
- **Notes:DEFECT INVALID TICKER AND ASSET SAVED.**

- ## TC ID: TC-ABF04

- **Form Filled (Input Screenshot):**



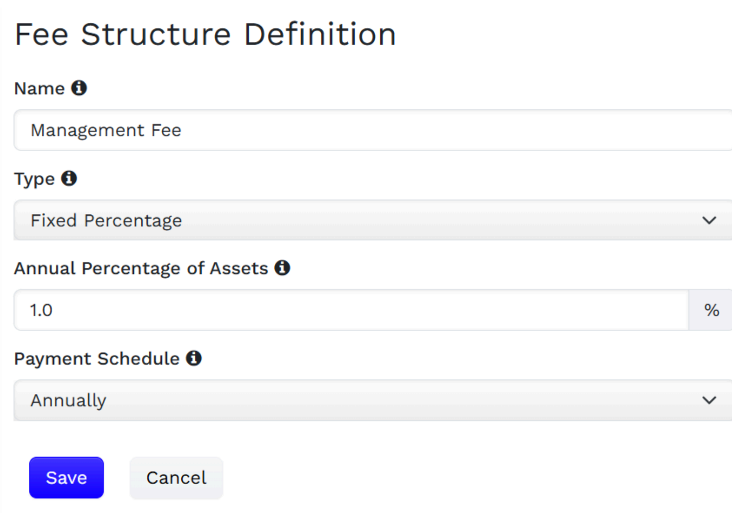
- **Result (Output Screenshot):**



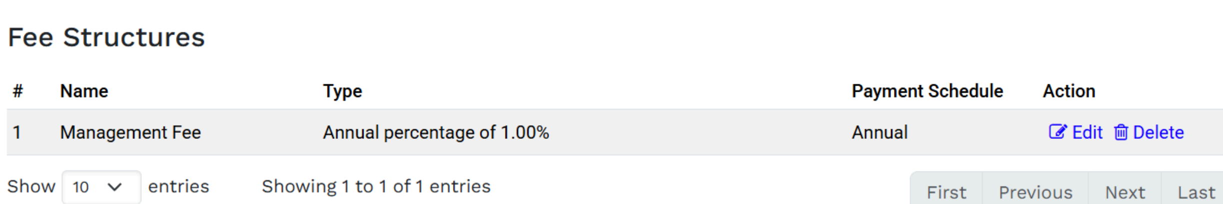
- **Notes:Worked as expected.**

- **TC ID: TC-MF01**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**


Fee Structures

#	Name	Type	Payment Schedule	Action
1	Management Fee	Annual percentage of 1.00%	Annual	Edit Delete

Show 10 entries Showing 1 to 1 of 1 entries First Previous Next Last

- **Notes:Worked as expected.**

- **TC ID: TC-MF02**

- **Form Filled (Input Screenshot):**

Fee Structure Definition

Name

TIERED MANAGEMENT

Type

Tiered Percentage

Successive Tiers

No

Annual Minimum

1500

Payment Schedule

Annually

Tier

For Assets Up To

Annual Percentage

Tier #1

$ 250000

1.00

Tier #2

$ 500000

0.90

Tier #3

$ 1000000

0.75

- **Result (Output Screenshot):**

Fee Structures

#	Name	Type	Payment Schedule	Action
1	Management Fee	Annual percentage of 1.00%	Annual	Edit Delete
2	TIERED MANAGEMENT	Tiered percentages with 3 tiers	Annual	Edit Delete

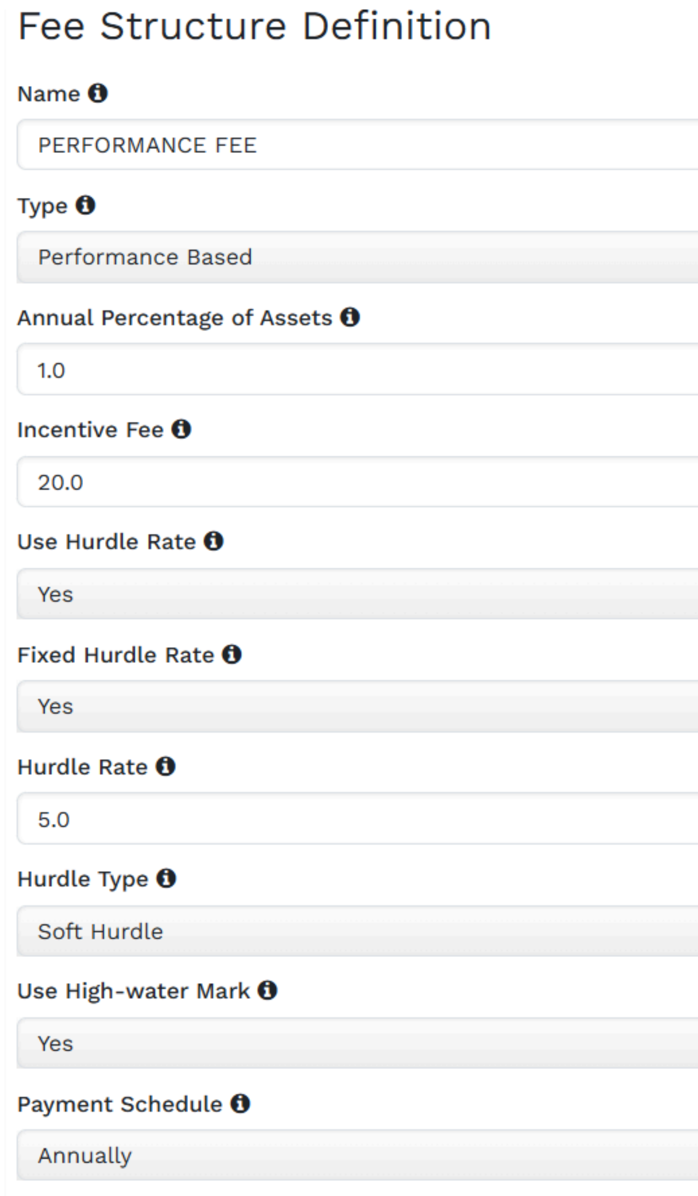
Show 10 entries Showing 1 to 2 of 2 entries

First Previous Next Last

- **Notes:Worked as expected.**

- **TC ID: TC-MF03**

- **Form Filled (Input Screenshot):**



Fee Structure Definition

Name
PERFORMANCE FEE

Type
Performance Based

Annual Percentage of Assets
1.0

Incentive Fee
20.0

Use Hurdle Rate
Yes

Fixed Hurdle Rate
Yes

Hurdle Rate
5.0

Hurdle Type
Soft Hurdle

Use High-water Mark
Yes

Payment Schedule
Annually

- **Result (Output Screenshot):**

Fee Structures

#	Name	Type
1	Management Fee	Annual percentage of 1.00%
2	PERFORMANCE FEE	Annual percentage of 1.00% with 20.00% perf(
3	TIERED MANAGEMENT	Tiered percentages with 3 tiers

- **Notes:Worked as expected.**

- **TC ID: TC-MF04**

- **Form Filled (Input Screenshot):**

Fee Structure Definition

Name

Type: Tiered Amount

Payment Schedule: Annually

Tier	For Assets Up To		Annual Fee
Tier #1	$ 500000	.00	$ 0
Tier #2	$ 250000	.00	$ 101

- **Result (Output Screenshot):**

Name cannot be blank
Tier #2 asset level is not greater than assets for tier #1

- **Notes:Worked as expected.**

- **TC ID: TC-MF05**

- **Form Filled (Input Screenshot):**

Fee Structure Definition

Name	FIXED AMT
Type	Fixed Amount
Annual Amount	2000 .00
Inflation Adjusted	No
Annual Increase	2.5 %
Payment Schedule	Annually

- **Result (Output Screenshot):**

Fee Structures

#	Name	Type
1	FIXED AMT	Annual fee of $2,000 adjusted by 2.50% every y
2	Management Fee	Annual percentage of 1.00%
3	PERFORMANCE FEE	Annual percentage of 1.00% with 20.00% perfo
4	TIERED MANAGEMENT	Tiered percentages with 3 tiers

Show 10 entries Showing 1 to 4 of 4 entries

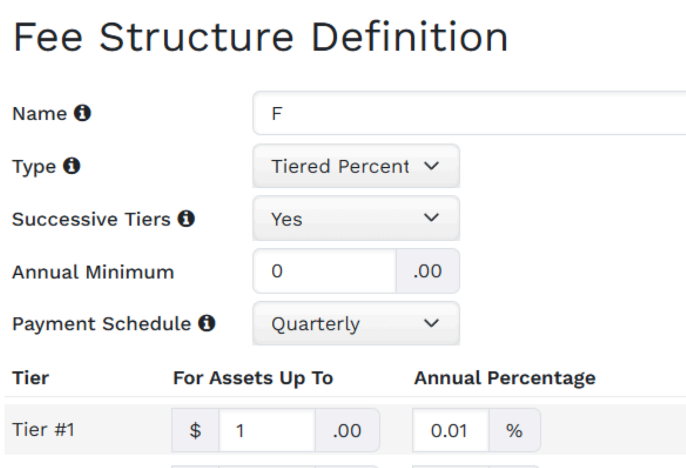
First Previous Next L

Add Fee Structure

- **Notes:Worked as expected.**

- **TC ID: TC-MF06**

- **Form Filled (Input Screenshot):**

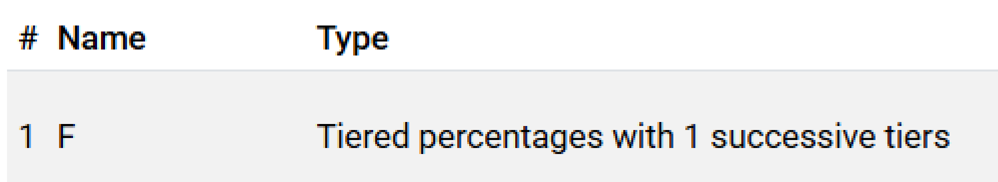


Fee Structure Definition

Name	F
Type	Tiered Percent
Successive Tiers	Yes
Annual Minimum	0 .00
Payment Schedule	Quarterly

Tier	For Assets Up To	Annual Percentage
Tier #1	$ 1 .00	0.01 %

- **Result (Output Screenshot):**



#	Name	Type
1	F	Tiered percentages with 1 successive tiers

- **Notes:Worked as expected.**

- **TC ID: TC-MF07**

- **Form Filled (Input Screenshot):**

Fee Structure Definition

Name	RANDOMNAMERANDOMNAMERANDOMNAM
Type	Performance E
Annual Percentage of Ass	101.(%
Incentive Fee	101.(%
Use Hurdle Rate	Yes
Fixed Hurdle Rate	Yes
Hurdle Rate	101.(%
Hurdle Type	Hard Hurdle
Use High-water Mark	Yes
Payment Schedule	Monthly

- **Result (Output Screenshot):**

5 RANDOMNAMERANDOMNAMERANDOMNAMERANDOMNAMERANDOMNA

- **Notes:DEFECT AS PERCENTAGES ARE GREATER THAN 100 AND STILL ACCEPTED.**

- ## TC ID: TC-ME01

- **Form Filled (Input Screenshot):**

Capital Market Expectations

#	Type	Asset	Return	Volatility
1	Asset Class	US Large Cap	8 %	15 %
2	Asset Class	Total US Bond Market	4 %	5 %
3	Asset Class	REIT	2 %	25 %

- **Result (Output Screenshot):**

Changes saved successfully.

- **Notes:Worked as expected.**

- ## TC ID: TC-ME02

- **Form Filled (Input Screenshot):**

Capital Market Expectations

#	Type	Asset	Return		Volatility	
1	Ticker	Apple Inc (AAPL)	12	%	20	%
2	Ticker	"A"	0	%	0.2	%
3	Ticker	VERYLONGVERYLONGVERYLONGVE	100	%	100	%
4	Asset Class	Emerging Markets	-100	%	25	%
5	Asset Class	Total US Bond Market	101.0	%	0.0	%
6	Asset Class	Select...	-101.0	%	-5.0	%
7	Ticker	Ticker symbol	100000000	%	-12-313321:	%
8	Asset Class	Emerging Markets	-3213210	%	-21-221.123	%
9	Asset Class	Select...	Mean	%	Volatility	%
10	Asset Class	Select...	Mean	%	Volatility	%

Add More

- **Result (Output Screenshot):**

Expected volatility must be positive for asset on row 5
No asset specified for expectations on row 7
Expectations for the same asset specified multiple times. Review row 8

- **Notes:Worked as expected.**

- ## TC ID: TC-ME03
- **Form Filled (Input Screenshot):**
- **Result (Output Screenshot):**
- **Notes:Worked as expected.**
- ## TC ID: TC-ME04
- **Form Filled (Input Screenshot):**
- **Result (Output Screenshot):**
- **Notes:Worked as expected.**
- ## TC ID: TC-MR01
- **Form Filled (Input Screenshot):**

Company Name	Portfolio Visualizer
Include Logo	Yes
Logo Image	Choose File No file chosen Current image: Default Logo Image
Page Footer Text	www.portfoliovisualizer.com
Page Footer Link	https://www.portfoliovisualizer.com
Use Cover Page	No
Cover Page PDF	Choose File No file chosen Current page: No Cover Page
Include Page Numbers	Yes
Include Report Date	Yes
Custom Disclosures	Replace default disclosures
Disclosures	Leave as blank to use the defaults

Report Font	Roboto
Chart Colors	Palette 1
Report Title Background	#00649E
Report Title Foreground	#FFFFFF
Section Title Background	#D8D8D8
Section Title Foreground	#000000
Table Header Background	#4477AA
Table Header Foreground	#FFFFFF
Disclosures Background	#ECECEC

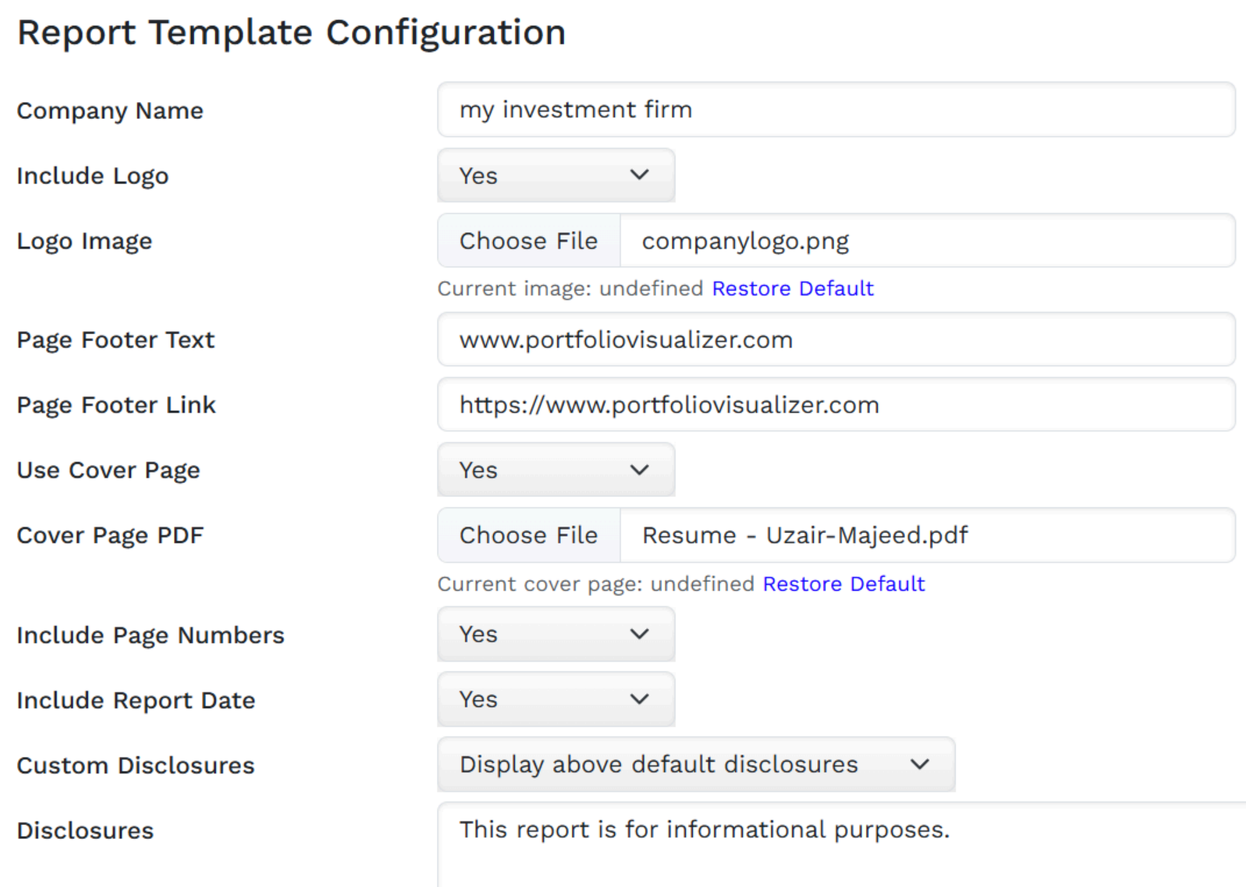
- **Result (Output Screenshot):**

Changes saved successfully.

- **Notes:Worked as expected.**

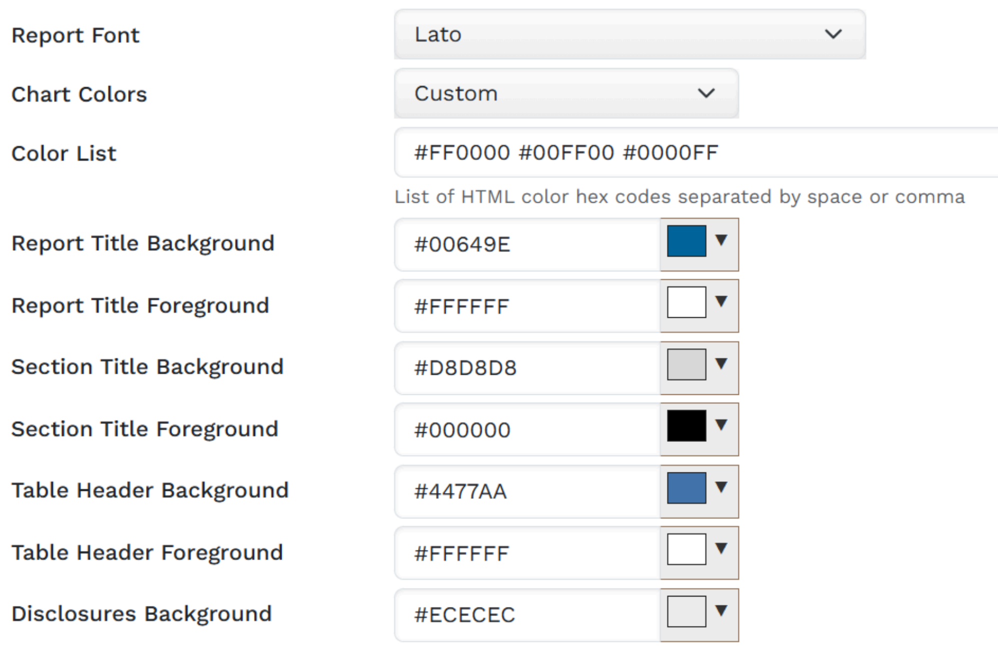
- **TC ID: TC-MR02**

- **Form Filled (Input Screenshot):**



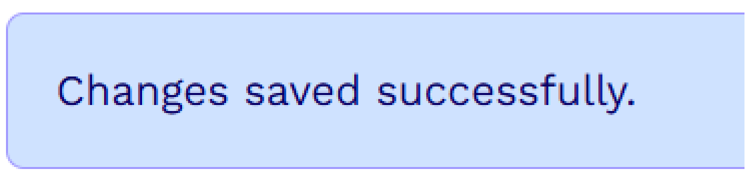
Report Template Configuration

Company Name	my investment firm
Include Logo	Yes
Logo Image	Choose File companylogo.png Current image: undefined Restore Default
Page Footer Text	www.portfoliovisualizer.com
Page Footer Link	https://www.portfoliovisualizer.com
Use Cover Page	Yes
Cover Page PDF	Choose File Resume - Uzair-Majeed.pdf Current cover page: undefined Restore Default
Include Page Numbers	Yes
Include Report Date	Yes
Custom Disclosures	Display above default disclosures
Disclosures	This report is for informational purposes.



Report Font	Lato
Chart Colors	Custom
Color List	#FF0000 #00FF00 #0000FF List of HTML color hex codes separated by space or comma
Report Title Background	#00649E
Report Title Foreground	#FFFFFF
Section Title Background	#D8D8D8
Section Title Foreground	#000000
Table Header Background	#4477AA
Table Header Foreground	#FFFFFF
Disclosures Background	#ECECEC

- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- ## TC ID: TC-MR03

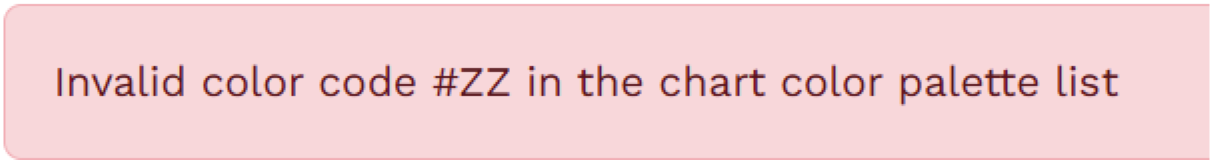
- **Form Filled (Input Screenshot):**

Report Template Configuration

Company Name	Company name
Include Logo	Yes
Logo Image	Choose File Capture.PNG Current image: undefined Restore Default
Page Footer Text	www.portfoliovisualizer.com
Page Footer Link	WRONGURL
Use Cover Page	No
Cover Page PDF	Choose File No file chosen Current page: No Cover Page
Include Page Numbers	No
Include Report Date	No
Custom Disclosures	Display below default disclosures
Disclosures	This report is for informational purposes.

Report Font	Montserrat
Chart Colors	Custom
Color List	#ZZ #00FF00 #*&^%$#@ #FFF?., List of HTML color hex codes separated by space or comma
Report Title Background	#FF0000
Report Title Foreground	#FFFFFF
Section Title Background	#D8D8D8
Section Title Foreground	#000000
Table Header Background	#4477AA
Table Header Foreground	#FFFFFF
Disclosures Background	#ECECEC

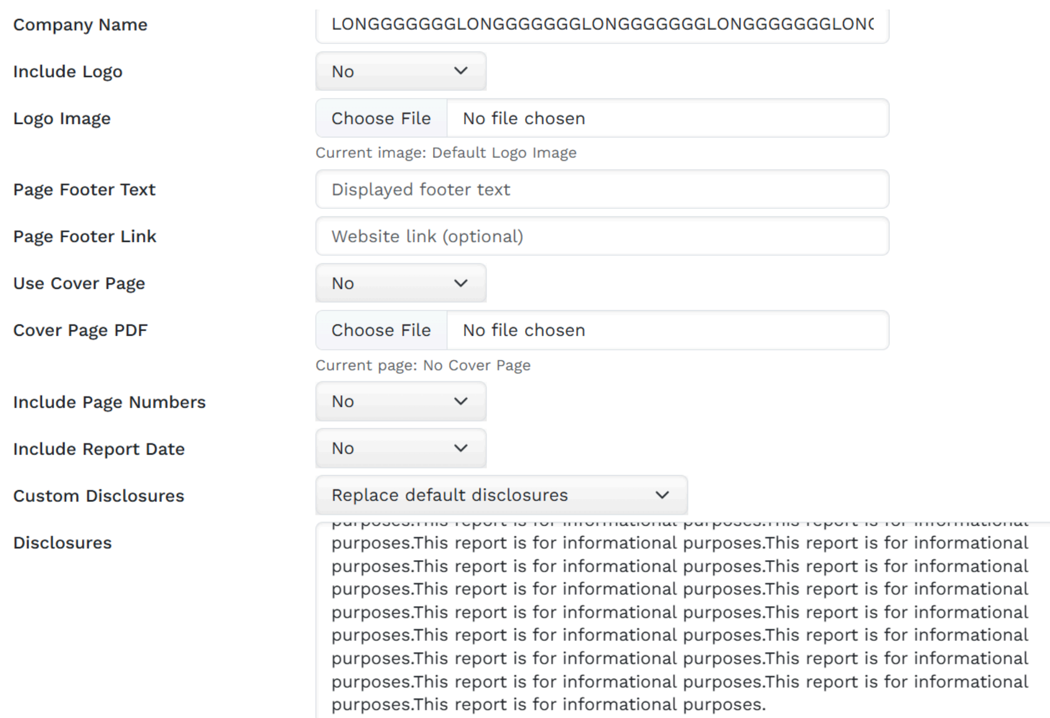
- **Result (Output Screenshot):**

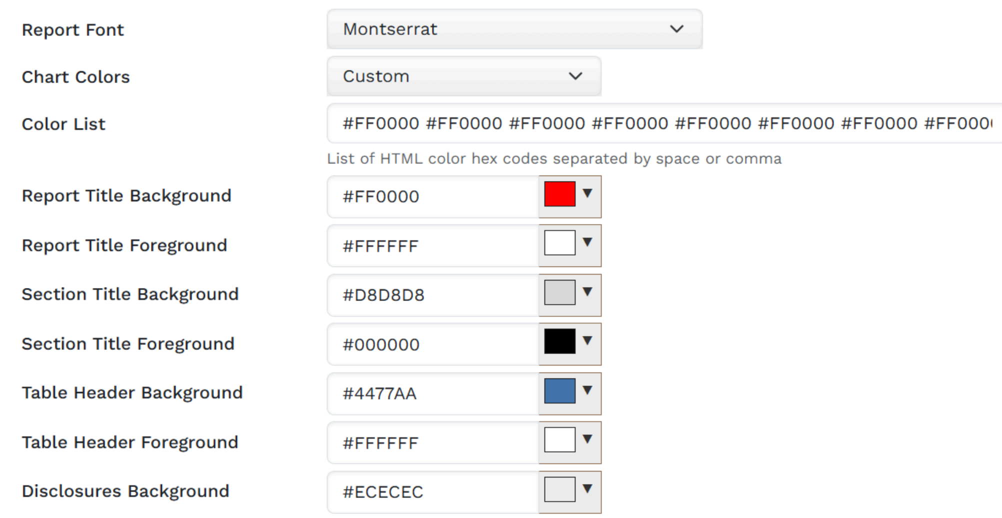


- **Notes:DEFECT ALLOWS COMPANY NAME TO BE EMPTY IN THE REPORT. COMPANY NAME IS A MAJOR FIELD AND MUST BE ALLOWED EMPTY.**

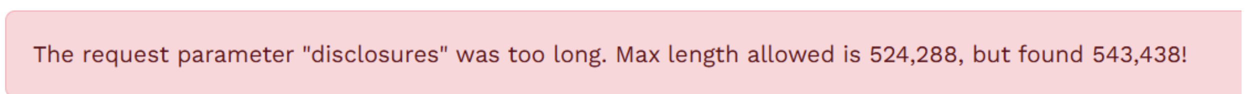
- ## TC ID: TC-MR04

- **Form Filled (Input Screenshot):**





- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- ## TC ID: TC-REG01

- **Form Filled (Input Screenshot):**

Regime Series Definition

Name	Volatility Regime
Description	VIX-based
Regime Data Source	Existing Series
Time Series	Vanguard Tax-Managed Small Cap I (VTSIX)
Series Type	Monthly Index Values
Regime Definitions	Value Breakdown
Smoothing Factor	None
Default Regime Type	Normal Market
Regime Levels	

Comparison	Threshold	Regime Type
>=	20	High
>=	15	Elevated
Select		
Select		

Regime Sort Order	Chronological

- **Result (Output Screenshot):**

Market Regimes

Market Regimes

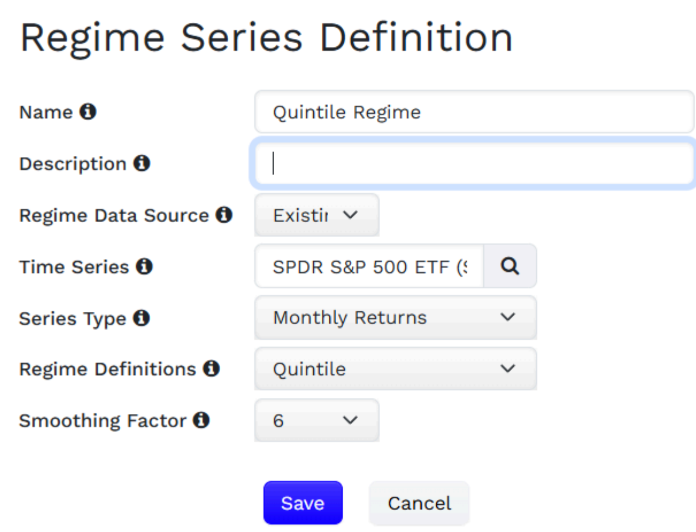
#	Name	Description
1	Volatility Regime	VIX-based

Show 10 entries Showing 1 to 1 of 1 entries

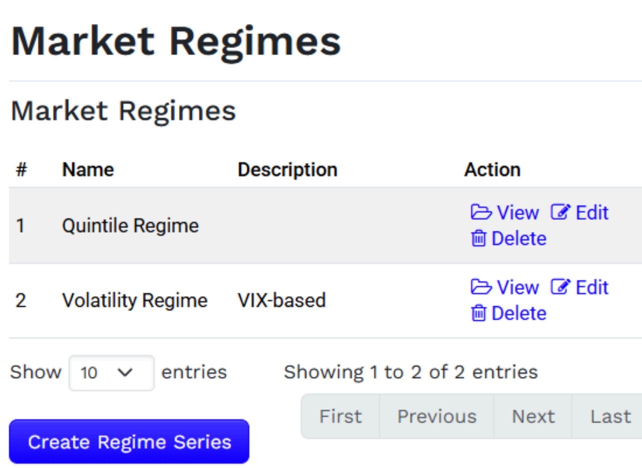
- **Notes:Worked as expected.**

- **TC ID: TC-REG02**

- **Form Filled (Input Screenshot):**



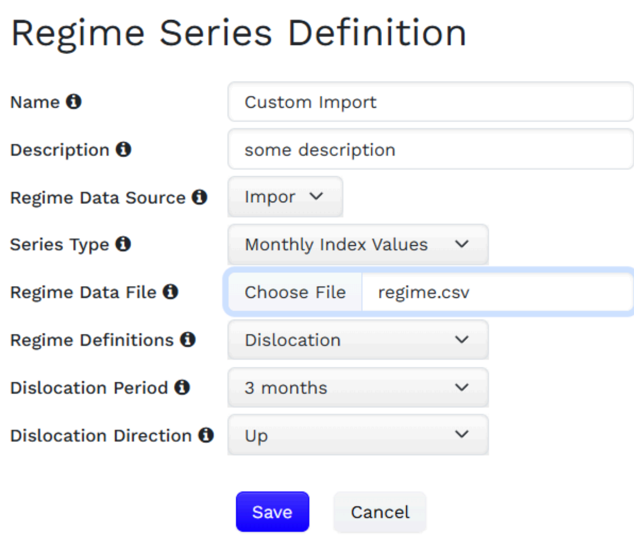
- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

- ## TC ID: TC-REG03

- **Form Filled (Input Screenshot):**

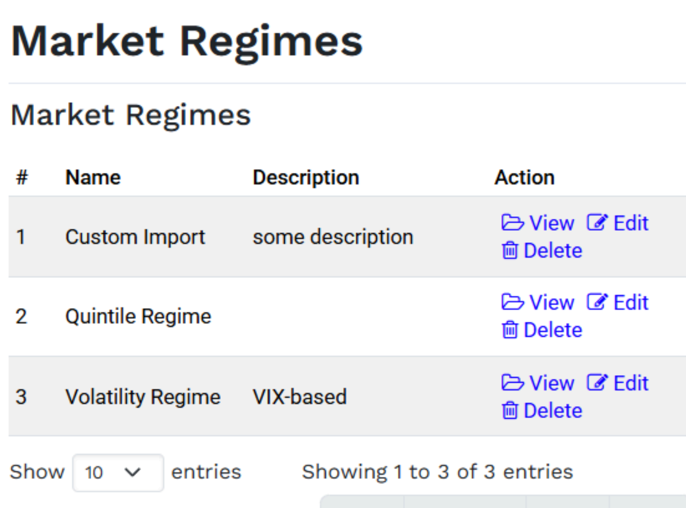


Regime Series Definition

Name	Custom Import
Description	some description
Regime Data Source	Impor
Series Type	Monthly Index Values
Regime Data File	Choose File regime.csv
Regime Definitions	Dislocation
Dislocation Period	3 months
Dislocation Direction	Up

Save Cancel

- **Result (Output Screenshot):**



Market Regimes

Market Regimes

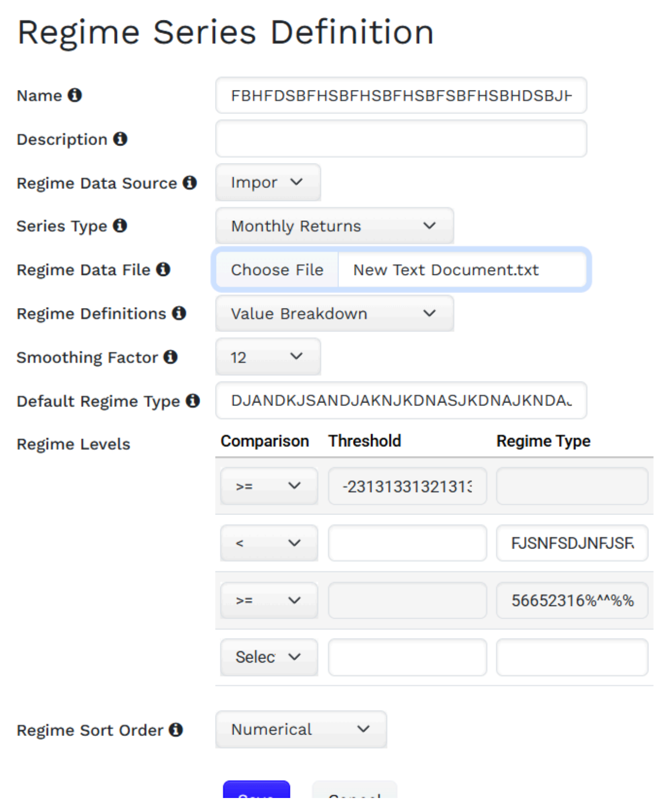
#	Name	Description	Action
1	Custom Import	some description	View Edit Delete
2	Quintile Regime		View Edit Delete
3	Volatility Regime	VIX-based	View Edit Delete

Show 10 entries Showing 1 to 3 of 3 entries

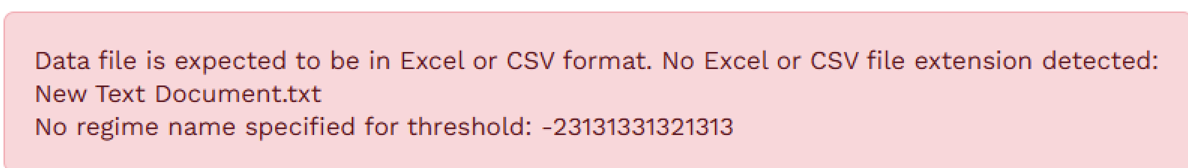
- **Notes:Worked as expected.**

- ## TC ID: TC-REG04

- **Form Filled (Input Screenshot):**



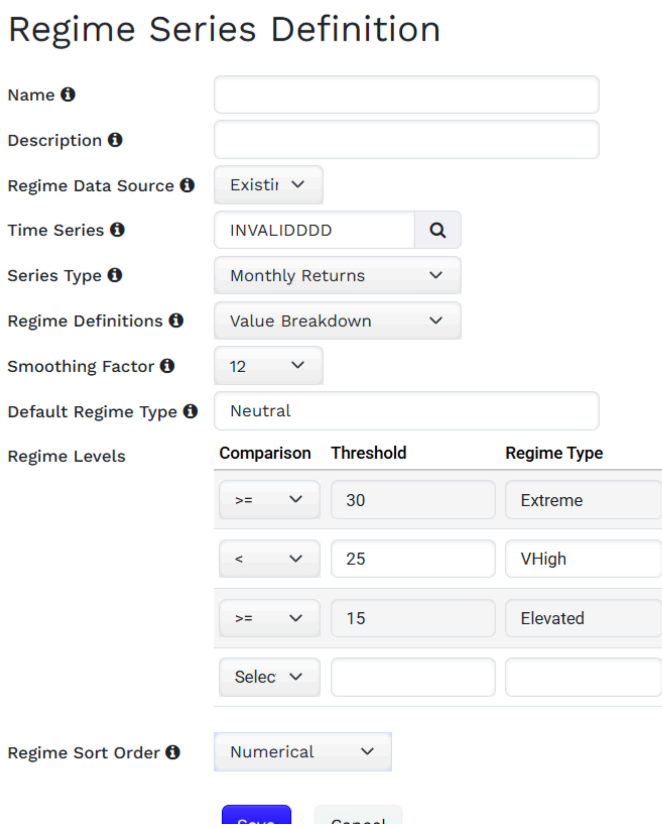
- **Result (Output Screenshot):**



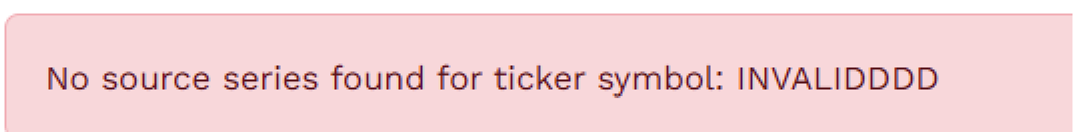
- **Notes:Worked as expected.**

- **TC ID: TC-REG05**

- **Form Filled (Input Screenshot):**



- **Result (Output Screenshot):**



- **Notes:Worked as expected.**

---

7. Defect/Issue Reports

Use one entry per defect found.

ID: DEF-BP-03

Title: Withdrawal percentage accepts only up to 90%, not 100% as UI/placeholder suggests
Tool/URL: Backtest Portfolio — Withdrawal Percentage
Steps to Reproduce:

1. Go to Backtest Portfolio form.
2. Set Cashflows → Withdraw fixed percentage.
3. Enter 100 in withdrawal percentage field.
4. Click "Analyze".

Expected Result: System should accept any value from 0 up to 100% (inclusive), as per tooltip/placeholder/UI, or document clearly if upper bound intended to be 90%.
Actual Result: Error displayed, "only 0–90% allowed".
Evidence: ADDED ABOVE

Severity: Medium (validation boundary error can confuse users, misleads regarding limits)
Notes/Oracle: Check if helptext/documentation or UI should be corrected to match code behavior, or vice versa.

ID: DEF-BP-04A

Title: Portfolio allocation accepts negative % values
Tool/URL: Backtest Portfolio
Steps to Reproduce:

1. Enter assets with allocations: Asset 1 = 100%, Asset 2 = -10%.

2. Click “Analyze”

Expected Result: System rejects negative allocations, displays error.
Actual Result: System accepts negative input and runs analysis.
Evidence: ADDED ABOVE
Severity: High (User can get invalid/undefined results from negative allocation.)
Notes: None

ID: DEF-BP-04B

Title: Leverage Amount accepts and processes non-numeric input
Tool/URL: Backtest Portfolio (Leverage Fields)
Steps to Reproduce:

1. Set Leverage Type to Fixed Debt.
2. Enter “02-012323-22” in amount field.
3. Click “Analyze”.

Expected Result: System rejects non-numeric value, displays validation error.
Actual Result: System accepts and processes input; may ignore, treat as zero, or behave unpredictably.
Evidence: ADDED ABOVE
Severity: Medium–High (May lead to silent input corruption or misanalysis).
Notes: Possible silent data corruption or analysis error.

ID: DEF-MCS-07

Title: Exponential/very high values accepted in percentage and inflation
Tool/URL: Monte Carlo Simulation
Steps to Reproduce:

1. Enter extremely high (exponential) values in withdrawal percentage and inflation fields.

2. Run simulation.

Expected Result: System should reject impractical/exponentially high values or give a clear warning/error.
Actual Result: Simulation runs with those values; no error generated.
Evidence: ADDED ABOVE
Severity: Medium
Notes: Allows nonsensical input; could mislead users or cause unstable results.

ID: DEF-MR-03

Title: Company Name is allowed to be empty in reports
Tool/URL: Manage Reports Form
Steps to Reproduce:

1. Open Manage Reports.
2. Blank out Company Name field.
3. Save/Generate report.

Expected Result: System should require company name (non-empty) for all reports.
Actual Result: Save is allowed, report shows no company name.
Evidence: ADDED ABOVE
Severity: High
Notes: Company Name is a required report field; missing name can break report identity/compliance.

ID: DEF-MF-07

Title: Percentages > 100 accepted in market expectations
Tool/URL: Market Expectations
Steps to Reproduce:

1. Fill returns or volatility % fields with values >100.

2. Try to save/submit.

Expected Result: System should restrict entry to ≤100%.
Actual Result: Values >100 are accepted and saved.
Evidence:ADDED ABOVE
Severity: Medium
Notes: Should apply upper bound validation to percentages for realistic input.

ID: DEF-ABF-03

Title: Invalid ticker and asset values saved
Tool/URL: Asset Backfill Configuration
Steps to Reproduce:

1. Enter non-existent/invalid ticker and backfill ticker.

2. Save configuration.

Expected Result: System should reject and display error for unknown/invalid tickers.
Actual Result: Invalid tickers are saved in configuration.
Evidence: ADDED ABOVE
Severity: High
Notes: May cause backfill data errors or failures in downstream processes and analytics.

---

8. Reflection

During boundary and equivalence class partitioning (ECP) testing of Portfolio Visualizer's financial forms, several key themes emerged:

1. Input Fields and Boundaries with the Most Issues:

- *Boundary numeric fields* (particularly percentages such as withdrawal %, inflation rate, and allocations) revealed the most issues. Some fields inexplicably capped at 90%

despite UI suggesting 100% was valid, while others accepted extremely high or negative values that led to nonsense results.

- *Text fields* (such as company name for report branding) were inconsistently validated; critical identity fields could be left empty, producing reports with missing branding.

- *Ticker and asset fields* revealed weak validation, sometimes allowing non-existent tickers or negative allocations, both of which can break downstream logic.

2. Challenges in Determining Expected Results:

- Defining expectations for complex financial inputs is nontrivial. Some business rules (e.g., should negative returns, allocations, or percentages ever be allowed? Are limits meant for user experience or risk control?) were not always documented, requiring cross-checking UI hints, tooltips, and observed application output.

- Certain fields, especially those with indirect or "optional" constraints, left ambiguity around validation: for example, whether a field should strictly reject, auto-correct, allow, or merely warn on out-of-range input.

- Testing fields dependent on conditional UI logic (like file uploads, regime levels, or asset list handling) added complexity, as validation sometimes missed cases when controls were dynamically shown/hidden.

3. Patterns Observed in Validation Consistency:

- Validation was inconsistent: settings with business risk (e.g., large or negative allocations, >100% percentages, empty company names) were sometimes permitted, while harmless inputs were restricted (e.g., 100% withdrawal, which should be allowed by standard definition).

- In some cases (like Market Regime or Asset Backfill), backend validation seemed to only check for type or completion, not semantic correctness (e.g., whether tickers exist, or regime codes are in valid range).

- Error messages and limits were not always kept in sync with tooltips or form labels, leading to potential user confusion.

4. Value of ECP and BVA in Uncovering Issues:

- Applying **ECP** forced a thorough exploration of valid and invalid input classes, bringing out unexpected behaviors especially in "edge" or unusual input combinations (e.g., mixing valid and invalid tickers/assets, zero/negative allocations, missing required fields).

- **Boundary Value Analysis** (BVA) highlighted cutoff errors: Several upper/lower boundary failures (90% vs. 100%, 0/negative allowed when they shouldn't be) only emerged through targeted LB, UB, and just-beyond testing.

- ECP and BVA together exposed where documentation, UI, and code validation were misaligned, and clarified both unclear requirements and incorrect behaviors by forcing explicit checks of every range, combination, and special state.
