Columbus Historical Events Analysis

2017-08-09

Report Overview

This is part one of two reports analyzing the performance of the Columbus algorithm during important historical market events and crises. The analysis consists of two separate reports, each analysing the algorithm's behavior using two different investment universes.

1) This current report uses a proxy universe made up of mutual funds to approximate the performance of the Columbus ETF universe. This has the important advantage of enabling us to go back in history to 1998, thereby allowing us to understand how the Columbus algorithm managed the portfolio during the dot-com boom and the ensueing crisis. The financial crisis is also analyzed.

2) In another report, the Columbus ETF universe is used and starts in May 2008. This is due to the limited history of certain ETFs making up that universe. More recent crises, including the financial crisis will be analyzed in that report.

A list of the mutual funds used to make up the proxy universe is provided separately.

Historical Performance using the Mutual Funds universe

The following chart shows the performance of the Columbus algorithm using the proxy mutual funds universe.

**Columbus Historical Performance (shown on a log scale)
Using Mutual Funds as Proxy for ETF Universe**
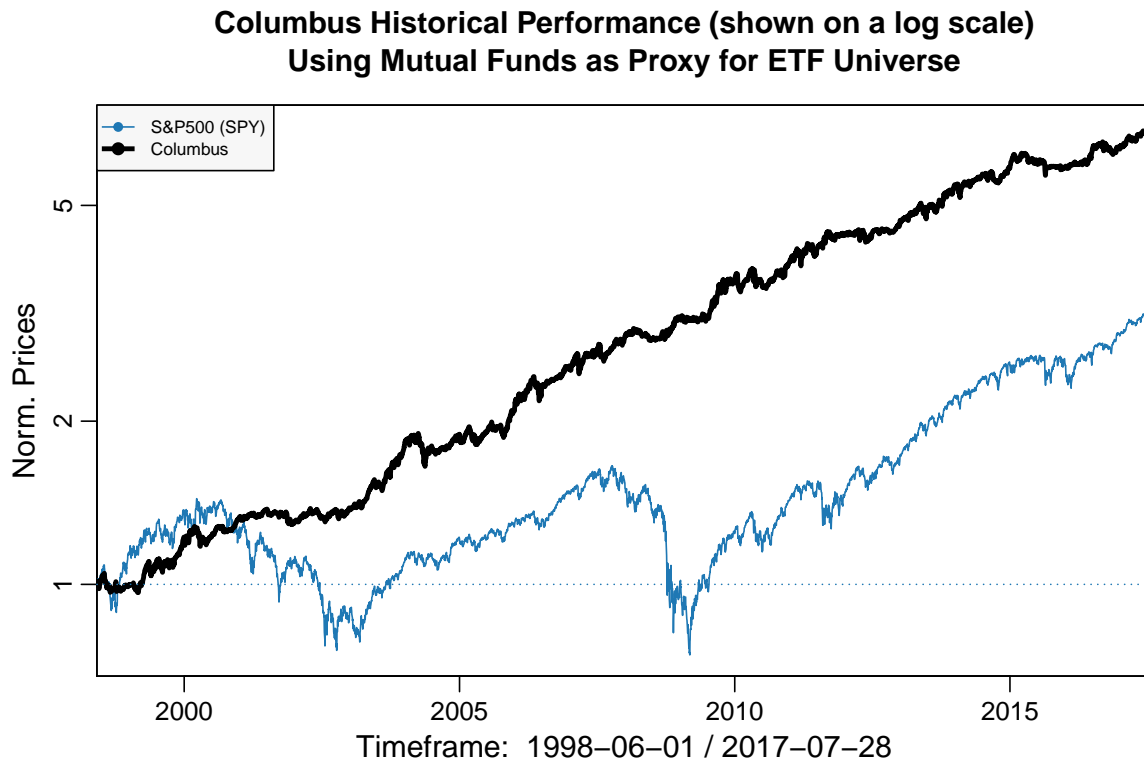
Historical Performance Numbers

The following table shows the performance of Columbus (using the proxy mutual funds universe) and the S&P500 (SPY) performance from June 1998 until August 2017. The chart below the table shows the rolling 12 months returns for Columbus and the S&P500 ETF (SPY) to help visualize the positive rolling annual timeframes of both equity curves.

Performance Summary

	Columbus	S&P500 (SPY)
Annualized Return (%)	10.91	6.39
Max. Drawdown (%)	−13.07	−55.2
Max. Drwdn Days	212	1200
Drawdown 2 (%)	−9.79	−47.5
Drwdn 2 Days	110	1626
Drawdown 3 (%)	−8.99	−18.25
Drwdn 3 Days	314	88
Annualized Std Dev (%)	8.49	19.79
Annualized Sharpe	1.29	0.32
MAR	0.83	0.12
Ulcer Index (%)	3.06	18.36
Ulcer Performance Index	3.57	0.35
Pos. Rolling Years (%)	94.94	74.25

1998−06−01 / 2017−07−28

Rolling 12 Months Performance

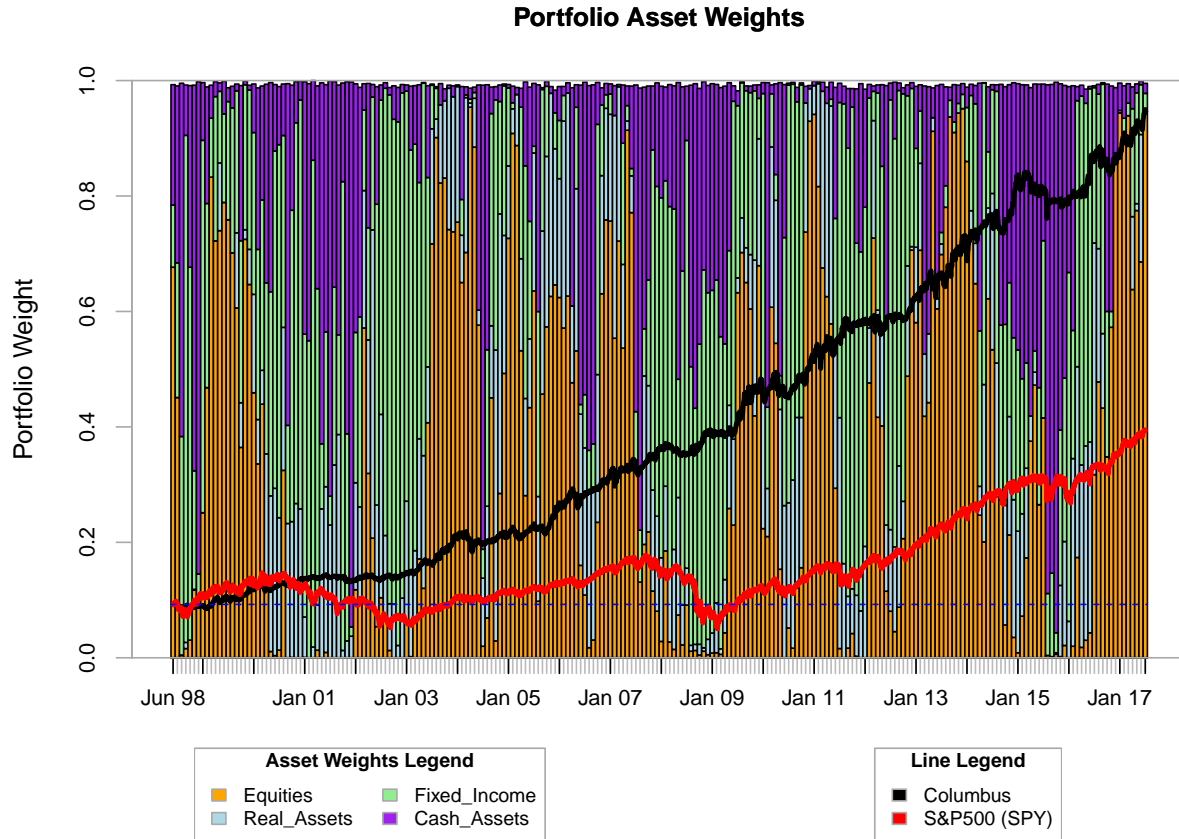Timeframe: 1998−06−01 / 2017−07−28
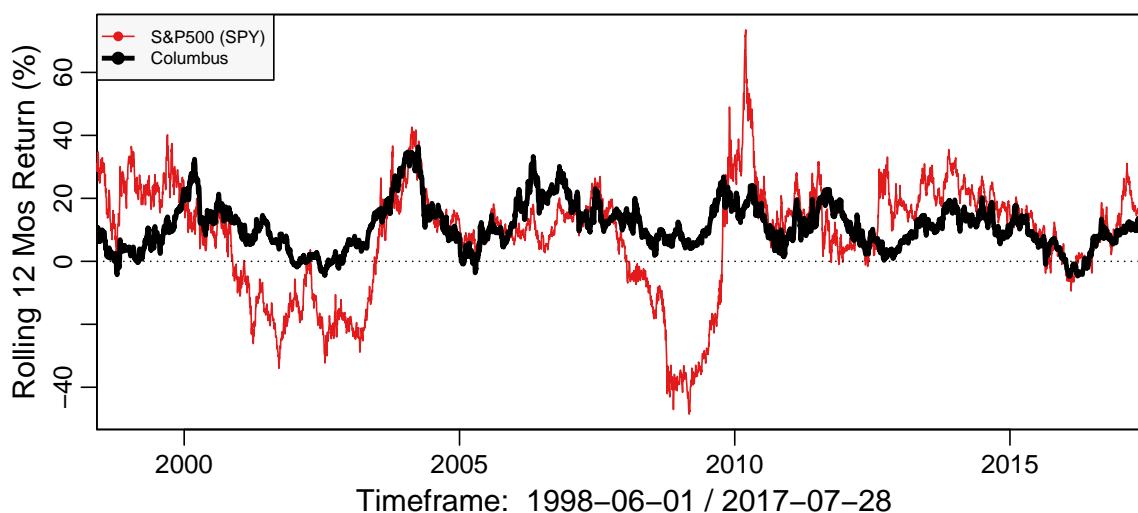
Asset Class Weight Allocation

The following chart shows the asset class weight allocation overlaid with the Columbus equity curve and the S&P500 ETF (SPY). These are shown on a linear scale.

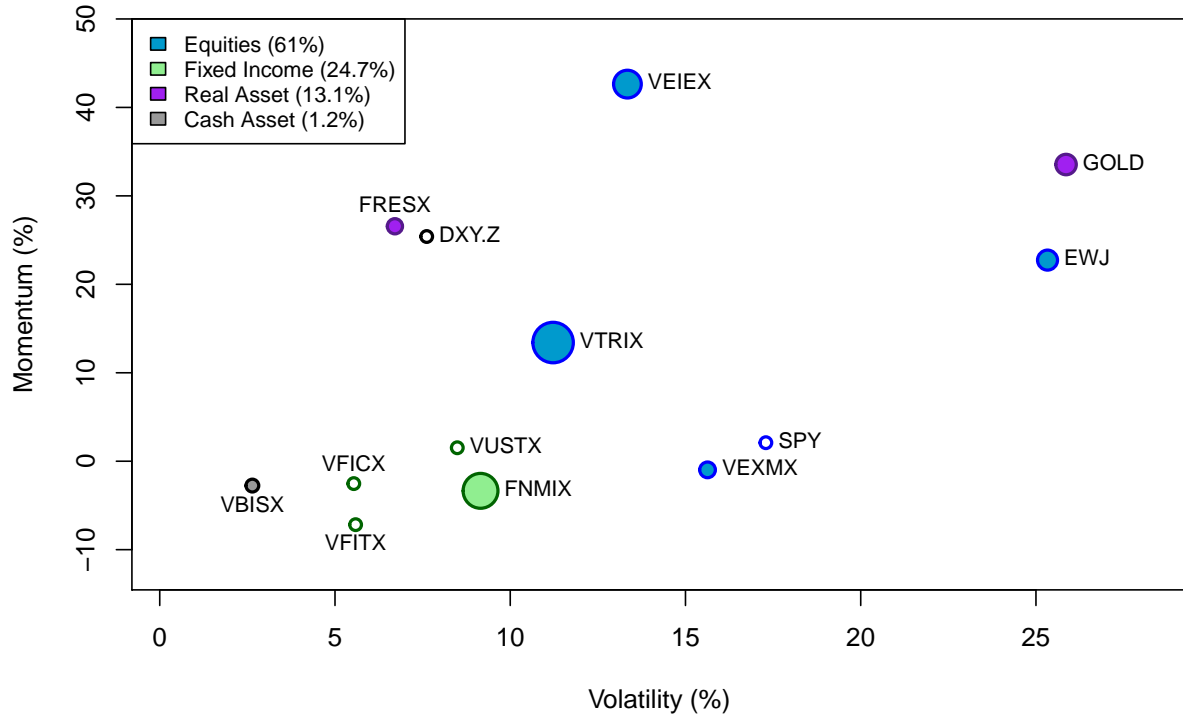**Portfolio Asset Weights**

Dot-com Crash Analysis

The set of charts on the following pages zoom into the period surrounding the dot-com crash and the events leading up to it. The first chart shows the asset class weight allocation along with the equity curves from August 1999 until December 2003.
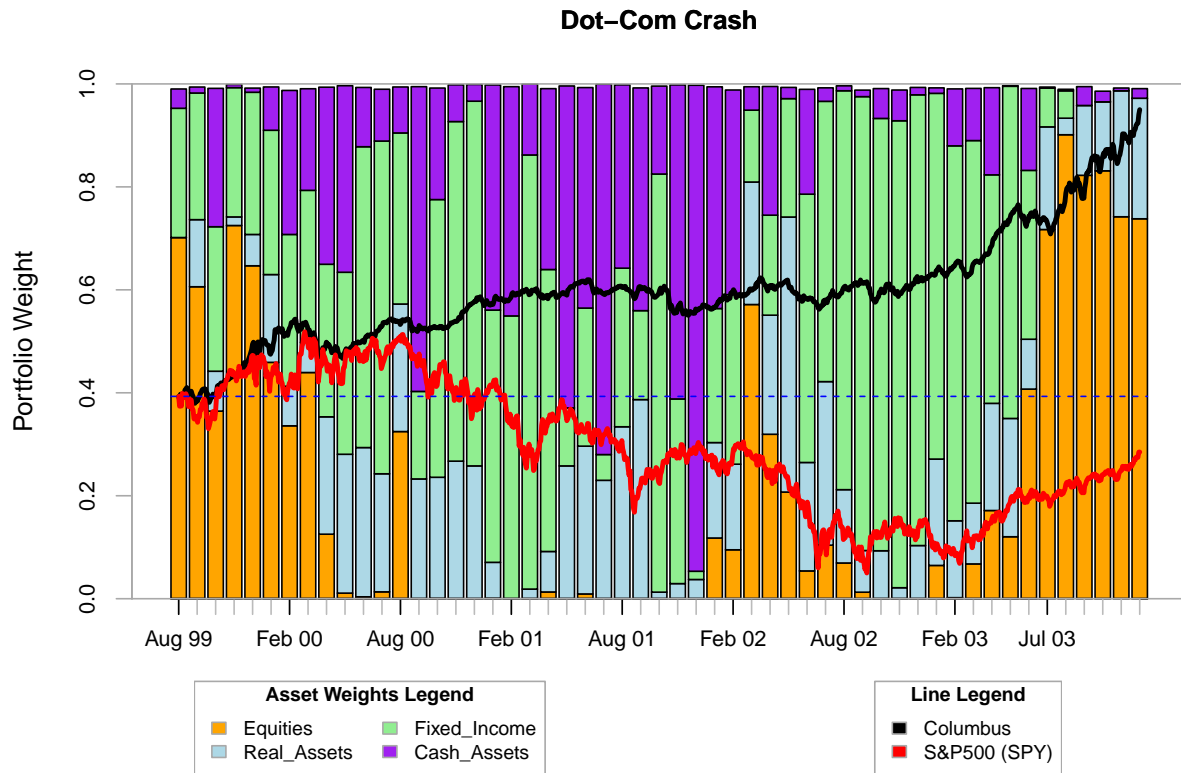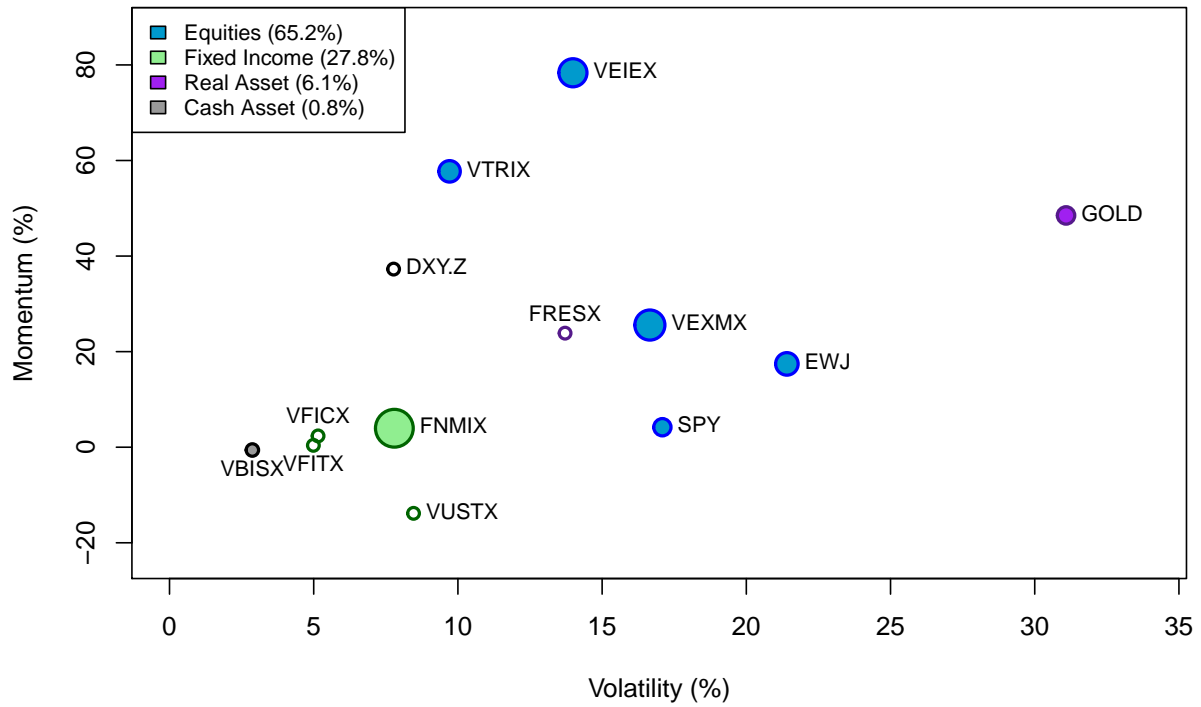
Dot−Com Crash

Dot-Com Crash Analysis using Momentum-Volatility Bubble Plots

It is of interest to understand, with the benefit of hindsight, how the Columbus algorithm allocated its assets leading up to and during the dot-com crisis. The following set of charts locate the momentum (annualized in %) vs. volatility (also annualized in %) for each mutual fund in the universe at specific dates of interest. The colors of the dots represent the asset class, whereas the size of the dots represent the relative allocation to that asset. The legend also summarizes the percentage allocation in each asset class.
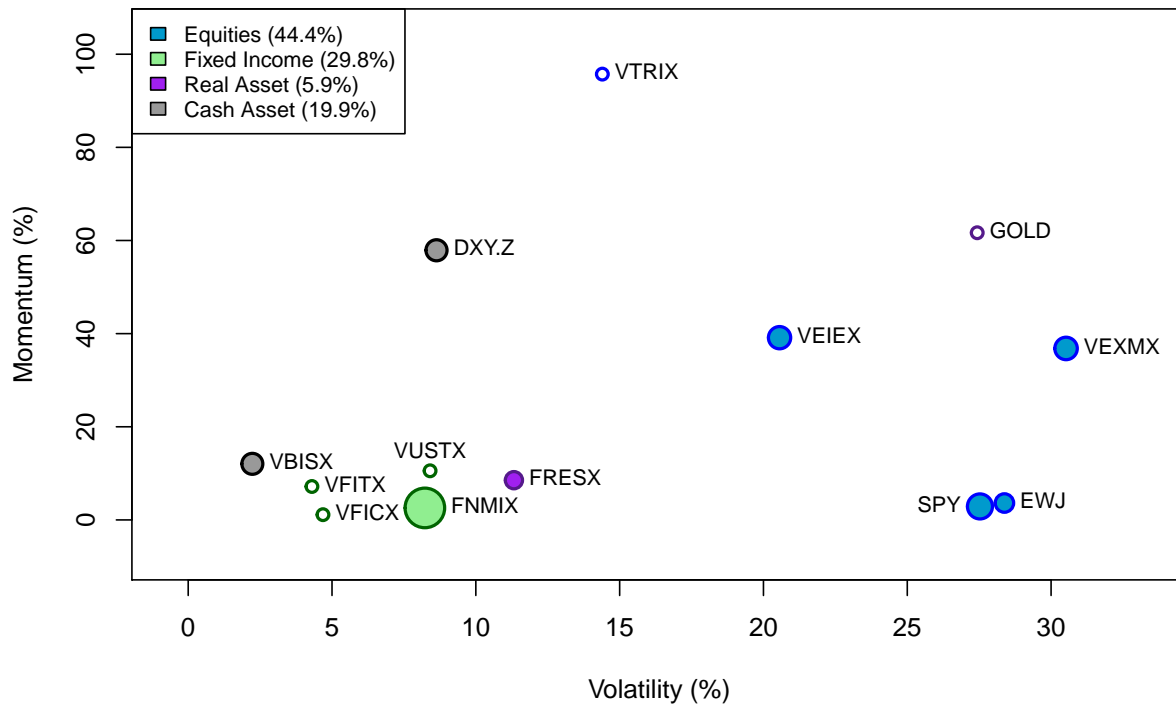
Momentum vs. Volatility Bubble Plot
As of 1999–09–29
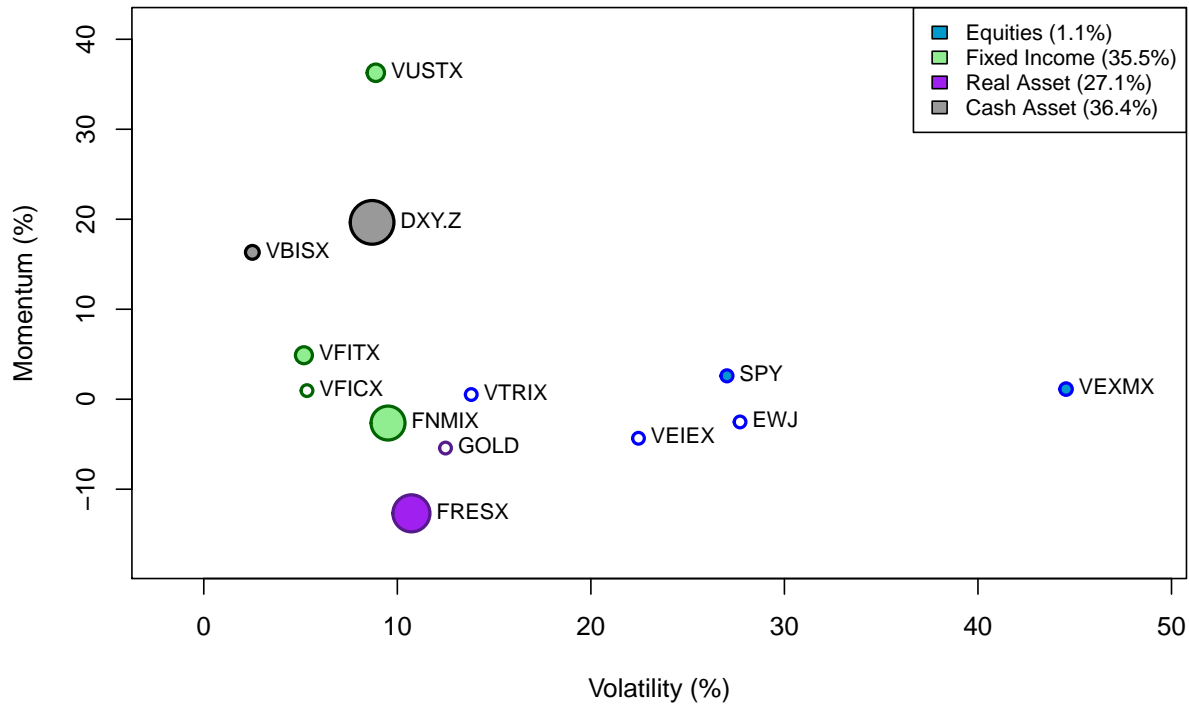
Legend:
- Equities (61%)
- Fixed Income (24.7%)
- Real Asset (13.1%)
- Cash Asset (1.2%)

Momentum vs. Volatility Bubble Plot
As of 1999–12–29

Legend:
- Equities (65.2%)
- Fixed Income (27.8%)
- Real Asset (6.1%)
- Cash Asset (0.8%)

Momentum vs. Volatility Bubble Plot
As of 2000−03−30

Legend:
- Equities (44.4%)
- Fixed Income (29.8%)
- Real Asset (5.9%)
- Cash Asset (19.9%)

Momentum vs. Volatility Bubble Plot
As of 2000−05−30

Legend:
- Equities (1.1%)
- Fixed Income (35.5%)
- Real Asset (27.1%)
- Cash Asset (36.4%)
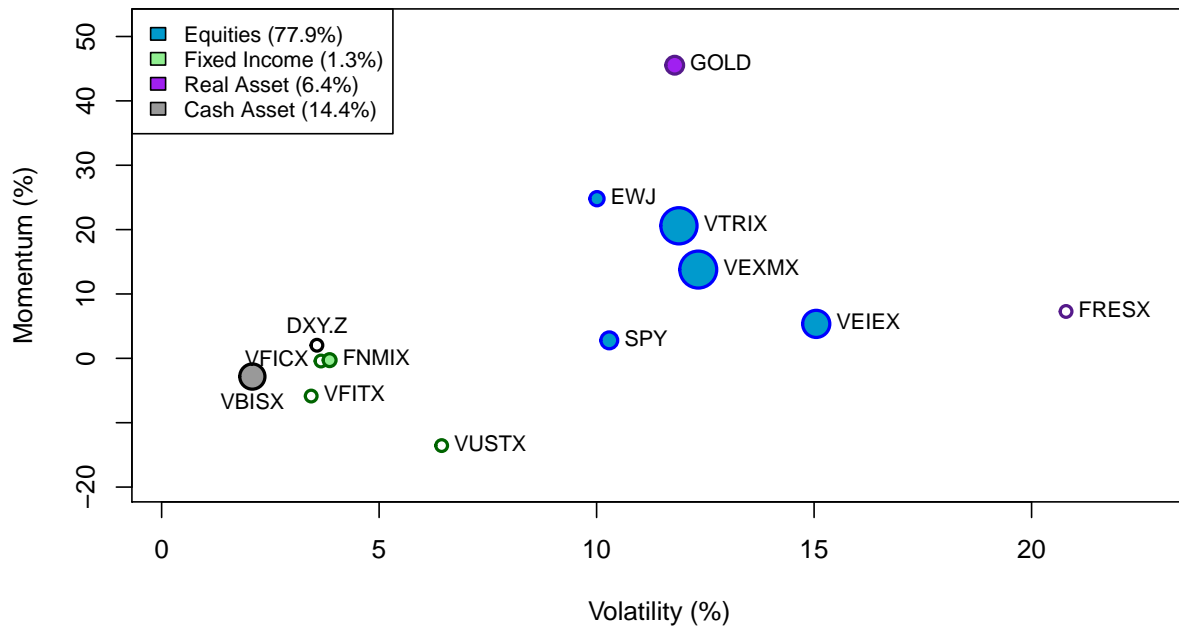
Financial Crisis Analysis using Mutual Funds Universe
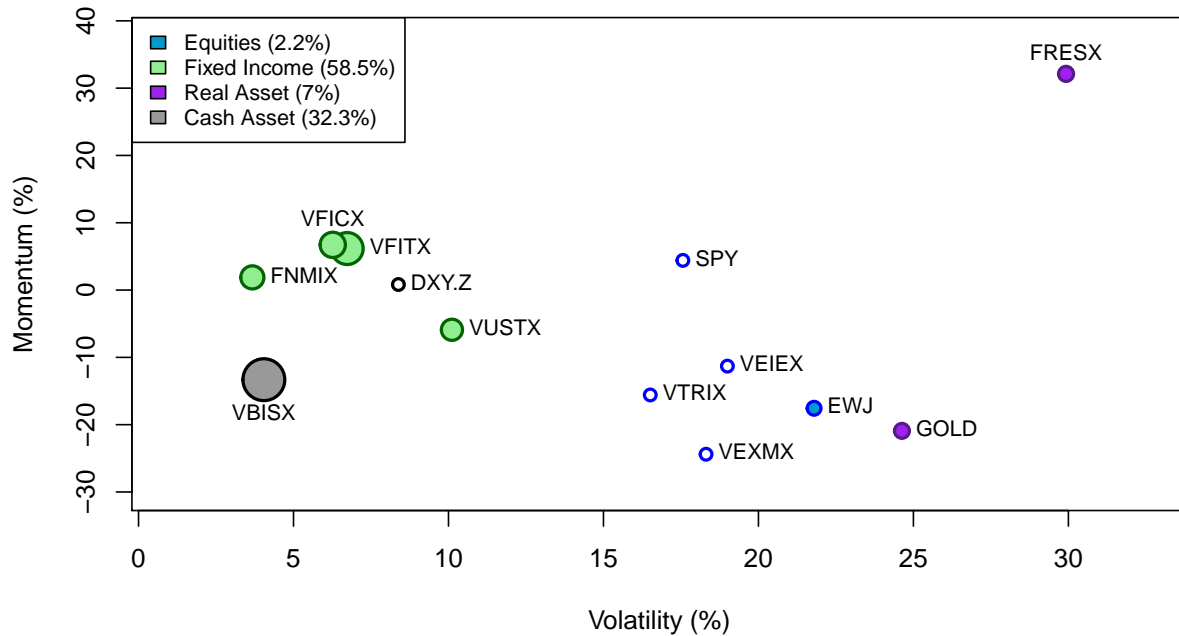
The following set of charts show the allocation before and during the financial crisis, along with bubble charts of interest.

Financial Crisis and its Onset

Momentum vs. Volatility Bubble Plot
As of 2007−06−28

Legend:
- Equities (77.9%)
- Fixed Income (1.3%)
- Real Asset (6.4%)
- Cash Asset (14.4%)

Labels: GOLD, EWJ, VTRIX, VEXMX, VEIEX, FRESX, DXY.Z, VFICX, FNMIX, SPY, VBISX, VFITX, VUSTX

Momentum (%) vs Volatility (%)

Momentum vs. Volatility Bubble Plot
As of 2008−06−27

Legend:
- Equities (2.2%)
- Fixed Income (58.5%)
- Real Asset (7%)
- Cash Asset (32.3%)

Labels: FRESX, VFICX, VFITX, SPY, FNMIX, DXY.Z, VUSTX, VEIEX, VTRIX, EWJ, VEXMX, GOLD, VBISX

Momentum (%) vs Volatility (%)

Momentum vs. Volatility Bubble Plot
As of 2008–09–29