

Minimum Risk vs. Capital and Risk Diversification strategies for portfolio construction

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Abstract

In this paper we propose an extensive empirical analysis on three different categories of portfolio selection models, each focused on different objectives: minimization of risk, maximization of capital diversification, and uniform distribution of risk allocation. This latter approach, also called Risk Parity (RP) or Equal Risk Contribution (ERC), is a recent strategy for asset allocation, where the risk measure commonly used to select RP portfolios is volatility. We propose here new developments on the ERC approach based on Conditional Value-at-Risk as risk measure.

We investigate how these classes of portfolio models (*Minimum-Risk*, *Capital and Risk Diversification*) work on seven investment universes, each with different sources of risk, which consist of equities, bonds and mixed assets. Then we highlight some strengths and weaknesses of all portfolio strategies in terms of various performance measures.

Keywords: Risk Parity, Diversification, Asset Allocation, Conditional Value-at-Risk, Portfolio Optimization.

1 Description of the data sets

1.1 GDP-Mix1: Global diversified portfolio

1. Citigroup Global Government Bond (ticker Bloomberg SBG7U index) in Usd;
2. JPMorgan Emerging Markets Bond (ticker Bloomberg JPGCCOMP index) in Usd;
3. MSCI Daily TR World Net Consumer Staples (ticker Bloomberg NDWUCSTA index) in Usd;
4. MSCI AC World Daily TR Net (ticker Bloomberg NDUEACWF index) in Usd;
5. GOLD SPOT (ticker Bloomberg GOLDLNPM index) in Usd;
6. DJUBS CrudeOilTR (ticker Bloomberg DJUBCLTR index) in Usd;

1.2 IBGEP-Mix2: Italian Bond and Global Equity Portfolio

1. Italy Govt 1-3 Yr TR (ticker Bloomberg ITG1TR index) in Eur;
2. Italy Govt 7-10 Yr TR (ticker Bloomberg ITG4TR index) in Eur;
3. DJStoxx 600 (ticker Bloomberg SXXR index) in Eur;
4. SP500 (ticker Bloomberg SPTR index) in Eur;
5. Gold (ticker Bloomberg GOLDLNPM index) in Usd;
6. MSCI Pacific (ticker Bloomberg NDDUP index) in Eur;
7. MSCI Emerging Markets (ticker Bloomberg NDUEEFG index) in Eur.

1.3 WWA-Mix3: Worldwide Asset

BOND:

1. ticker EUG1TR index, Bloomberg/EFFAS Euro Govt 1-3y TR, EUR;
2. ticker EUG2TR index, Bloomberg/EFFAS Euro Govt 3-5y TR, EUR;
3. ticker ITG4TR index, Bloomberg/EFFAS Italy Govt 7-10y TR, EUR;
4. ticker GRG4TR index, Bloomberg/EFFAS Germany Govt 7-10y TR, EUR;
5. ticker ER01, BofA ML Euro Corp 1-3y, EUR;
6. ticker IB8A index, IBOXX Euro Liquid Corporate, EUR;
7. ticker BEIG1T Index, Barclays Euro Govt Inflation-L, EUR;
8. ticker HWXD, BofA ML BB-B Global High Yield Non-Financial Constrained 1-3y, LOC;
9. ticker HW00, BofA ML Global High Yield, LOC;
10. ticker JPGCCOMP index, J.P. Morgan EMBI Global Diversified, Eur Hedged;
11. ticker JGENVUEG index, JPMorgan GBI-EM Global Diversified, EUR.

EQUITY:

12. ticker SPTR500N index, S&P 500 Net TR, Eur Hedged;
13. ticker RU20INTR index, Russell 2000 Total Return Index, Eur Hedged;
14. ticker SX5T index, Eurostoxx 50 Net TR, EUR;
15. ticker NCEDE15 Index, MSCI Europe Small Cap Net TR, EUR;
16. ticker MSDEEXUN Index, MSCI Daily Net TR, Europe Ex EMU, EUR;
17. ticker MXJPHEUR Index, MSCI Japan 100% Hdg TR EUR, Eur Hedged;

18. ticker NCLAJN Index, MSCI Daily TR Net Small Cap Japan, Eur Hedged;
19. ticker NDUECAPF Index, MSCI Daily TR Net AC Asia Pacif, EUR;
20. ticker NDUEEGFL Index, MSCI Daily TR Net Latin America, EUR;
21. ticker NDDUEMEA Index, MSCI Daily TR Emerging Europe & Middle East & Africa, EUR;
22. ticker TEMFMIU LX Equity, Franklin Templeton Investment Funds - Templeton Frontier Markets, EUR;

Commodity:

23. ticker GOLDLNPM Index, London Gold Market Fixing Ltd, EUR;
24. ticker OILB IM Equity, ETFS BRENT 1MTH OIL SECURITY, EUR;
25. ticker DJUBAGTR Index, BBG Agriculture TR, EUR;
26. ticker DJUBINTR Index, BBG Industrial Metals TR, EUR.

REAL ESTATE:

27. ticker DWGRSN Index, Dow Jones Global Select Real Estate Securities Net TR, EUR.

PRIVATE EQUITY:

28. ticker SPLPEQNT Index, S&P Listed Private Equity NTR, EUR.

1.4 Euro-Eq1: Stock Picking on Eurostoxx50

1. Basic Materials: Bayer AG;
2. Communications: Nokia OYJ;
3. Consumer, Cyclical: Daimler AG;
4. Consumer, Non-cyclical: Aventis;
5. Diversified: LVMH Moet Hennessy Louis Vuitton SA;
6. Energy: Royal Dutch;
7. Financial: Deutsche Bank AG;
8. Industrial: Siemens AG;
9. Utilities: Suez SA.

1.5 WES-Eq2: World Equity Sectors Portfolio

1. Energy (ticker Bloomberg: NDWUENR Index) in Usd;
2. Materials (ticker Bloomberg: NDWUMAT Index) in Usd;
3. Industrial (ticker Bloomberg: NDWUIND Index) in Usd;
4. Consumer Discretionary (ticker Bloomberg: NDWUCDIS Index) in Usd;
5. Consumer Staples (ticker Bloomberg: NDWUCSTA Index) in Usd;
6. Health Care (ticker Bloomberg: NDWUHC Index) in Usd;
7. Financials (ticker Bloomberg: NDWUFN Index) in Usd;
8. Telecommunications (ticker Bloomberg: NDWUTEL Index) in Usd;
9. Utilities (ticker Bloomberg: NDWUUTIL Index) in Usd.

1.6 EEC-Eq3: Equity Emerging Countries

1. Brazil (ticker Bloomberg: NDUEBRA Index);
2. Russia (ticker Bloomberg: NDEUSR Index);
3. India (ticker Bloomberg: NDEUSIA Index);
4. China (ticker Bloomberg: NDEUCHF Index);
5. Korea (ticker Bloomberg: NDEUSKO Index);
6. Thailand (ticker Bloomberg: NDEUTHF Index);
7. Malaysia (ticker Bloomberg: NDDUMAF Index);
8. Taiwan (ticker Bloomberg: NDEUSTW Index);
9. Indonesia (ticker Bloomberg: NDEUINF Index);
10. Turkey (ticker Bloomberg: NDEUTUR Index);
11. Mexico (ticker Bloomberg: NDEUMXF Index).

1.6.1 Euro-Bond: Euro Government Bond Portfolio

1. Germany Govt 7-10 Yr TR (ticker Bloomberg GRG4TR index);
2. France Govt 7-10 Yr TR (ticker Bloomberg FRG4TR index);
3. Netherlands Govt 7-10 Yr TR (ticker Bloomberg NEG4TR index);
4. Finland Govt 7-10 Yr TR (ticker Bloomberg FIG4TR index);

5. Belgium Govt 7-10 Yr TR (ticker Bloomberg BEG4TR index);
6. Italy Govt 7-10 Yr TR (ticker Bloomberg ITG4TR index);
7. Spain Govt 7-10 Yr TR (ticker Bloomberg SPG4TR index);
8. Portugal Govt 7-10 Yr TR (ticker Bloomberg PTG4TR index);
9. Ireland Govt 7-10 Yr TR (ticker Bloomberg IEG4TR index);
10. Greece Govt 7-10 Yr TR (ticker Bloomberg GCG4TR index).