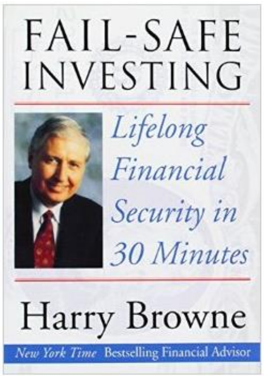
The Enhanced Permanent Portfolio Strategy

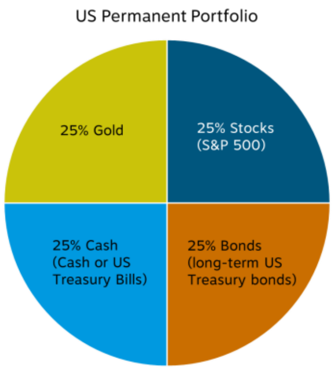
The investment process of the Enhanced Permanent Portfolio Strategy (“EPPS”) is based on the innovative investment research of Rational Invest. The basic concept on which the strategy is based is the Permanent Portfolio of Harry Browne, amongst the most well-known investment strategies worldwide. The strategy pursues a quantitative, rule-based investment process that adaptively allocates between stocks, bonds, commodities and cash instruments on a monthly basis to achieve a robust risk/return profile. Each of the asset classes is optimized individually applying a range of proprietary trading and allocation rules. Cross-correlations of instruments and asset classes are accounted for to achieve a significantly lower overall portfolio volatility. Amongst the methodologies applied are various ranking and rotation algorithms across sectors, industries, markets and asset classes globally. The methodologies deployed have been thoroughly tested across a broad set of economic conditions. The strategy is designed as a diversified all-weather multi-asset strategy generating robust performance while mitigating downside risk during severe market crashes.

This document covers the historical background of the strategy (Part 1), the modifications/enhancements made by Rational Invest (Part 2), implementation as well as historical performance and risk figures (Part 3) and concludes with some observations (Part 4).

Part 1 - Historical Background of the original Permanent Portfolio

Probably the best known investment strategy ”The Permanent Portfolio” was created by Harry Browne and published in 2001 in his book, Fail-Safe Investing: Lifelong Financial Security in 30 Minutes. He was an American writer, politician and investment analyst before becoming the Libertarian Presidential candidate in the U.S. elections of 1996 and 2000.





Browne’s highly original insight was to link specific asset classes with four basic economic conditions. The book calls this type of investment portfolio a "permanent portfolio" and advocates it to be re-balanced once per year so that the 25% allocation is maintained for each asset class:

- **25% in U.S. stocks (equities)**, to provide a strong return during times of **economic prosperity**. For this portion of the portfolio, Browne recommends a basic S&P 500 index fund.
- **25% in long-term U.S. Treasury bonds (fixed income)**, which do well during prosperity and during **deflation** (but which do poorly during other economic cycles).
- **25% in cash** in order to hedge against periods of “tight money” or **recession**.
- **25% in gold (commodities)** in order to provide protection during periods of **inflation**.

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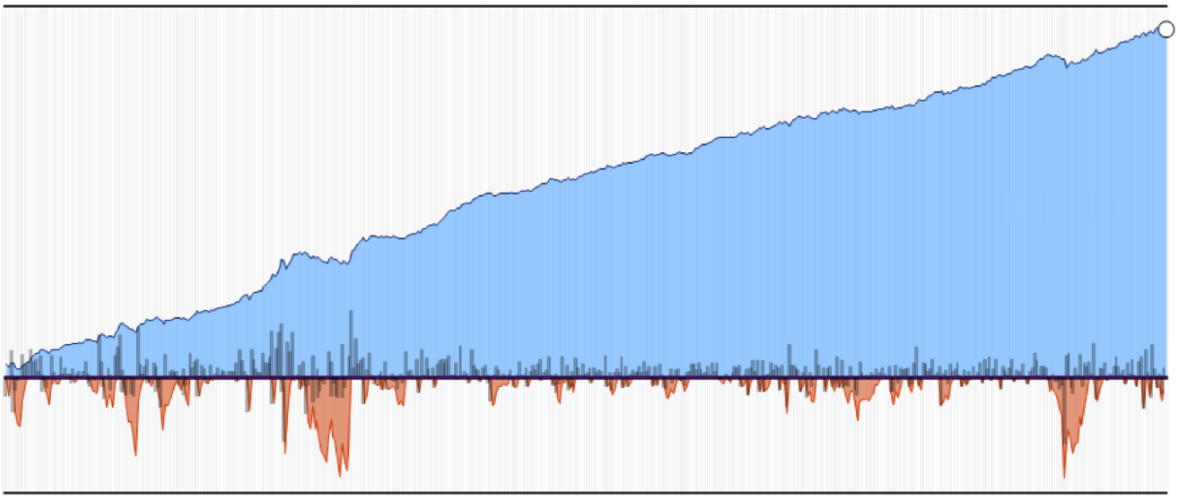
According to Browne such a permanent portfolio would be safe, simple and stable, with the idea to preserve and grow wealth in good times and bad. As can be seen in the following chart, the strategy worked well during the 42-year period from 1970 to 2012, generating an average yearly return (CAGR) of 8.55% with volatility averaging less than 7%.

The original Permanent Portfolio (equal weights in Stocks, Gold, Treasuries, and Cash)

Date Range [19700102 to 20120629]



Curve		Trade		Time	
Total Return	3182%	Trade Winning %	72%	% Winning Months	66%
CAGR	8.55%	Average Trade	2.14%	Average Winning Month	1.73%
Sharpe	1.25	Average Win	4.87%	Average Losing Month	-1.27%
DVR	1.10	Average Loss	-4.93%	Best Month	10.18%
MAR	0.48	Win/Loss Ratio	0.99	Worst Month	-8.28%
Max Daily Drawdown	-17.96%	Best Trade	49.4%	% Winning Years	93%
Average Drawdown	-0.97%	Worst Trade	-25.7%	Best Year	35.00%
Avg Drawdown Length	15.36	Avg Days in Trade	63.09	Worst Year	-6.46%
Avg Trades Per Year	16	Trades	667	Positive 12 Month Periods	93%

Source: Ken French, Shiller, CRB

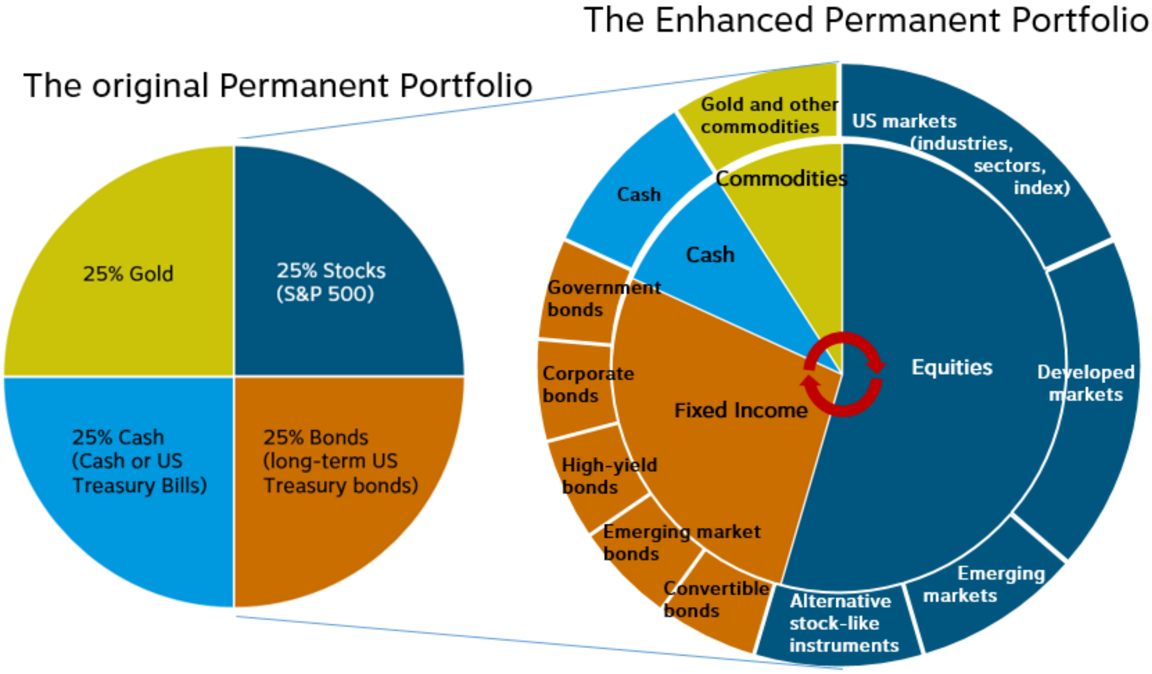
Part 2 – Rational Invest's enhancement of the Permanent Portfolio strategy

While the original Permanent Portfolio strategy, the static combination of stocks, treasuries, precious metals and cash, is compelling on its own, a range of enhancements can be made, leveraging on today's more efficient market structure and much broader available investment universe compared to 40 years ago:

- Trading commissions and spreads are much lower – allowing for monthly rebalancing instead of the original annual rebalancing.
- Monthly rebalancing further allows to adopt a variable allocation between asset classes, instead of the original fixed 25% allocation.
- There is no need to keep 25% cash all the time – applying an unconstrained and variable cash allocation with the goal of keeping volatility at a constant level ensures the portfolio is fully invested during bull markets, while a cash allocation of up to 100% is designed to protect the portfolio value during strong market corrections with high volatility.
- Instead of only investing in the US stock market index S&P 500, equity investments today can be made globally, in developed and emerging countries as well as alternative, stock-like instruments.
- Instead of only investing in long-term US Treasury bonds (e.g. as a crash hedge), other fixed income markets are very liquid today and can be used consequently to generate extra yield in the current low interest rate environment.

- Instead of only investing in gold, investments into other precious metal and other commodities are readily available today, allowing to diversify the portfolio further.
- Applying an advanced adaptive allocation algorithm, cross-correlations between and within asset classes are taken into account. The goal is to combine inversely correlated assets to minimize the volatility and maximize the return of the overall portfolio.

A comparative overview of the changes from the original to Rational Invest's Enhanced Permanent Portfolio is illustrated as follows:



Source: Rational Invest

Part 3 - Implementing the Enhanced Permanent Portfolio Strategy

Rational Invest's Enhanced Permanent Portfolio Strategy, a so-called meta-strategy, is built upon individual sub-strategies for each of the above asset classes.

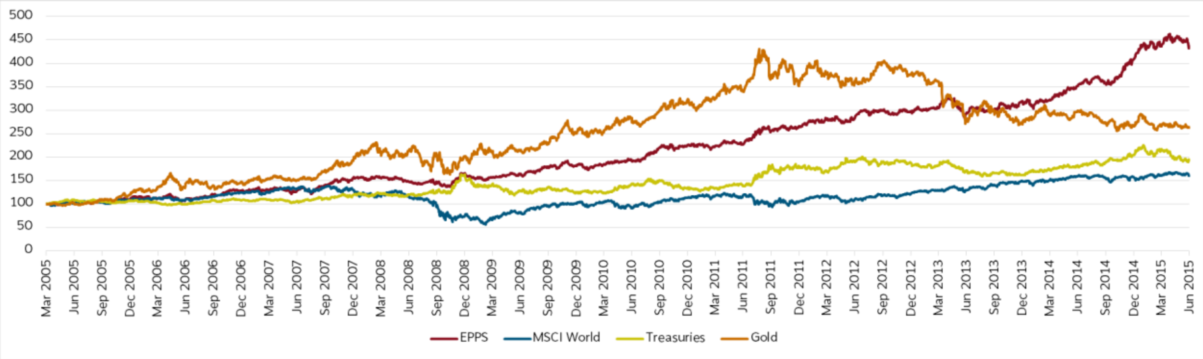
The Enhanced Permanent Portfolio Strategy allocates to these assets classes based on rule-based momentum, mean-reversion, timing and volatility targeting algorithms, always considering cross-asset/instrument correlations to achieve a robust risk/return profile and to mitigate downside risk during strong market corrections.

The strategy is unconstrained, where an asset or asset class underperforms for a prolonged period of time, the portfolio allocation can go to 0 for some time. The strategy can also shift 100% into cash. This is one of the biggest advantages compared to the original Permanent Portfolio allocation, as the average performance is lowered very significantly applying this static approach and experiencing drawdowns of up to 55% in one asset or asset class.

Rational Invest implements the strategy based on a global universe of exchange traded products. Outright shorting or the use of leverage are not part of the strategy, although leveraged or inverse exchange traded index exposures are made use of, provided the instruments are robust and can be efficiently traded.

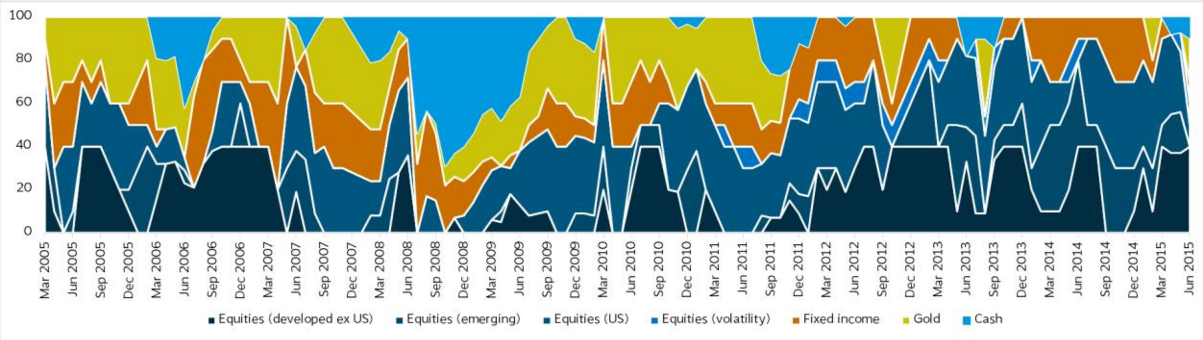
The historical backtesting results of the Rational Invest's Enhanced Permanent Portfolio Strategy are based on monthly rebalanced allocations of the sub-strategies since April 2005 (in steps of 10% to avoid too frequent allocation changes) are illustrated in the next chart:

Historical backtested performance development of the EPPS compared with major asset classes



Source: Rational Invest, Bloomberg; backtesting period 1 April 2005 – 30 June 2015; see notes on backtesting at the end of this document.

Historical allocation of the EPPS



Source: Rational Invest; backtesting period 1 April 2005 – 30 June 2015

Implementation notes equities:

– The main 3 equity sub-strategies are optimized individually applying a range of proprietary trading and allocation rules.

– The US equities strategy has been developed and will be implemented through industry, sector or broader sub-indices, depending on the prevailing equity market environment.

– For developed and emerging markets, the dispersion of returns between winner countries and loser countries is enormous. Hence, there it is a clear advantage in applying algorithms that only allocate to the winning countries, avoiding the losers that reduced the overall performance.

– The global country selection and rotation methodology ensures the overall equity strategy depends less on the US stock market performance, as was the case for the original Permanent Portfolio. The methodology allows the strategy to allocate to virtually any stock market provided it is liquid and can be accessed efficiently.

– The Enhanced Permanent Portfolio implements a globally diversified equities strategy with a capped allocation of 40% to any individual sub-strategy.

Implementation notes fixed income:

– Similar to equities, the various fixed income strategies are designed to allocate to market sectors across duration and credits with a view to rotate into positive yield opportunities to benefit the overall portfolio.

– To reduce the volatility of the equity strategies, long duration US Treasuries are used. These are negative correlated to stock markets during strong market corrections. The exact mix between US Treasuries and stocks is calculated so that volatility is minimized and return maximized. A special modified maximum Sharpe algorithm has been developed to achieve this.

Allocation to cash and volatility

- The EPPS shifts partially into cash during periods of higher volatility, like during the financial crisis of 2008/2009, with a view to achieve a constant volatility for the overall portfolio.
- The volatility strategy, limited to 10% of the overall portfolio, is applied opportunistically during periods of high volatility. The algorithms attempt to manage risk by switching early into Treasury or even cash exposure before volatility spikes.
- The strategy can also invest in small percentages of US $ index ETFs, to offset the US$ currency influence on non US$ stock markets.
- Currency risk is generally not hedged systematically.

Comparison of performance figures of the EPPS

		Equity strategies			Reference asset classes		
	EPPS	Developed markets	Emerging markets	US	MSCI World	Treasuries	Gold
Total return	**336%**	198%	224%	217%	60%	93%	162%
Annualised return	**15.67%**	11.40%	12.32%	12.07%	4.75%	6.74%	10.01%
Annualised volatility	**12.12%**	23.56%	34.03%	21.10%	21.51%	14.50%	20.33%
Sharpe Ratio	**1.29**	0.48	0.36	0.57	0.22	0.47	0.49
Max. drawdown	**-14.16%**	-61.39%	-72.98%	-53.40%	-59.44%	-26.59%	-40.52%
Correlation		0.39	0.27	0.31	0.27	0.36	0.42

Annual returns	EPPS	Developed markets	Emerging markets	US	MSCI World	Treasuries	Gold
YTD (to 30 June)	**6.41%**	10.91%	5.81%	3.94%	2.82%	-5.70%	-1.07%
2014	**27.99%**	-0.01%	39.76%	19.18%	3.83%	27.30%	-2.19%
2013	**7.73%**	34.65%	5.80%	36.63%	22.38%	-13.38%	-28.33%
2012	**11.87%**	20.12%	11.74%	18.11%	16.75%	2.41%	6.60%
2011	**17.88%**	-16.06%	-23.86%	3.48%	-7.82%	34.00%	9.57%
2010	**24.64%**	14.93%	20.90%	20.14%	12.78%	9.01%	29.27%
2009	**10.09%**	41.67%	64.43%	54.68%	32.36%	-21.81%	24.03%
2008	**6.60%**	-41.48%	-61.75%	-41.73%	-41.51%	33.95%	4.92%
2007	**19.99%**	33.69%	60.90%	19.03%	5.15%	10.30%	30.45%
2006	**16.88%**	31.31%	46.86%	7.14%	15.85%	0.71%	22.55%
2005 (from 1 April)	**9.87%**	18.42%	35.51%	10.87%	6.99%	6.91%	20.46%

Source: Rational Invest, Bloomberg; backtesting period 1 April 2005 – 30 June 2015; monthly rebalancing; see notes on backtesting as well as disclaimer at the end of this document.

Notes on performance:

- The EPPS achieved an average annual performance of 15.5% with a Sharpe ratio of 1.29.
- A dynamic and adaptive combination of the above sub-strategies allows to achieve the high Sharpe ratio of 1.29 for this period. This is mostly due to the low correlation of the different sub-strategies within and across asset classes.
- The historic volatility of the strategy (at 12%) is significantly lower than any investment in individual stock markets (e.g. MSCI World volatility at 21.5)
- The maximum drawdown was only 14% compared with 59% for the MSCI World for the same 10 year period.
- Equities are clearly the main performance driver.

Part 4: Conclusion

The underlying Permanent Portfolio strategy idea is one of most researched strategies. It worked well for the last 45 years, and there is a good possibility it will also work in the near future.

The adaptive Enhanced Permanent Portfolio Strategy allows to significantly increase the robustness and return potential of the original static Permanent Portfolio strategy.

The strategy is an all-in–one, diversified all-weather strategy.

The strategy invests in a globally diversified multi-asset portfolio allowing to avoid long periods of stagnation in major stock markets.

The strategy is able to mitigate substantial losses market corrections through changing the allocation within a short timeframe to a safe haven strategy.

The strategy is quite complex and is invested in 10-20 ETFs or Futures at any point in time, making this strategy more suitable to implement through pooled solutions, as opposed to individual investors implementing the strategy themselves.

Rational Invest AG
Zürich, June 2015

Backtesting
All information presented herein is backtested. Backtested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology to be used when an investment solutions is launched. The backtest period does not necessarily correspond to the entire available history. Another limitation of using backtested information is that the calculations are generally prepared with the benefit of hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities (e.g. dividends and withholding taxes) and fixed income markets in general which cannot be, and have not been accounted for, all of which can affect actual performance. The backtested returns presented in Part 3 have been adjusted by 4% per annum to account for fees and trading costs.

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