

Assessing Tactical Strategies Using Short Histories

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Peter James Lingane, EA, CFP®
Financial Security by Design
Lafayette, CA

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1

It's Worth Repeating ...

- "Trust, but verify!"
- Examples are not recommendations since I have no knowledge of your personal situation.
- Backtesting provides no guarantee as to future performance.

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Peter Lingane

- Financial planner and registered investment advisor.
- A penchant for bringing his considerable analytical skills to tax and investment issues.

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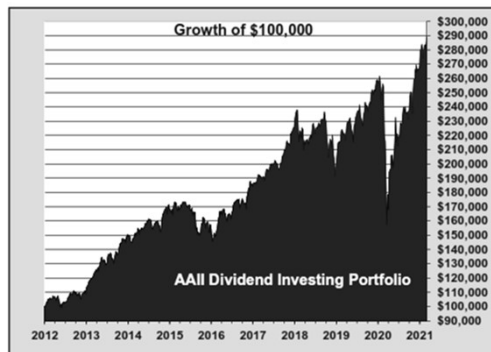
Strategies are usually backtested using different securities than those used for implementation. Part of your due diligence is to confirm that the surrogates have been well chosen. These backtests use different sources for the price histories of the long bonds.

2000-2020	Backtest A	Backtest B
Source of VUSTX Prices	Yahoo	Quality Provider
CAGR	11.15	12.14
mSD	0.030	0.030
Sharpe	0.93	1.02
MaxDD	0.18	0.17
UPI	1.48	1.85
WINS36	0.68	0.83
Longevity Risk	11%	5%

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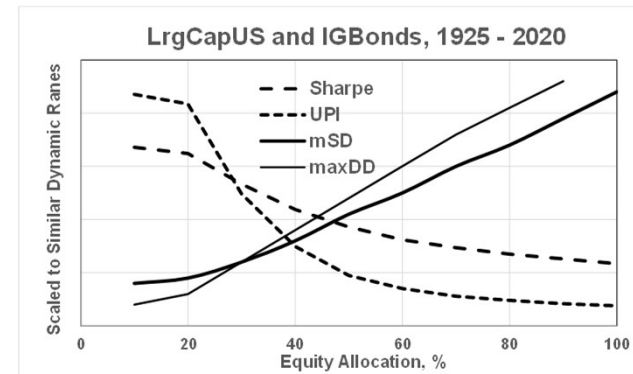
An "Equity Curve"
is the strategy value over time.



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Better values are found at lower equity
allocations



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"Volatility" - fluctuations in the EC.
Standard Deviation (dSD, mSD, aSD)

"Drawdown" - decline during market
corrections and bear markets.

"Sharpe Ratio" - return per unit of volatility.
Average Return / Standard Deviation

"Ulcer Performance Index (UPI)"
Average Return / Std Dev of Drawdowns

These are conceptual definitions. See "Definitions of Algorithms and Timers."

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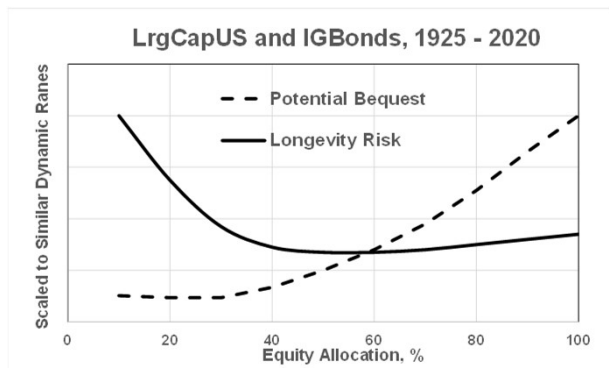
"Longevity" - risk of running out of money
over a specified time interval, e.g., 30 years.

Legacy Potential - the Value at Death.

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Better values are found at higher equity allocations



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- Moderate volatility
- Better (lower) drawdowns
- Better (lower) longevity risks
- Better (higher) Sharpe ratios
- Better (higher) UPIs
- Better legacy potential

Some could even be implemented using pencil and paper, but a spreadsheet is less tedious.

12

12

There is a tension between

1. Low volatility and low drawdown.
2. Longevity risk and legacy potential.

Traditional buy and hold strategies of security selection, diversification and rebalancing do not resolve this tension.

There are tactical strategies which help to resolve this tension.

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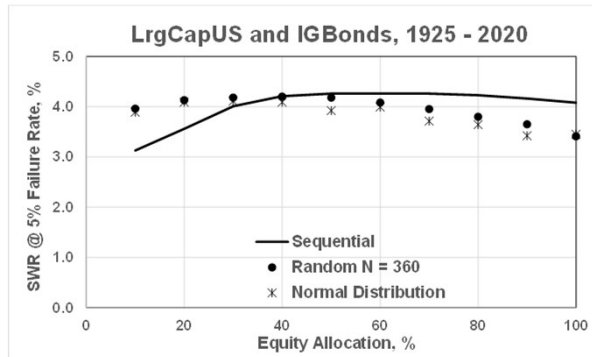
“Risk” implies a range of outcomes.
Many equity curves are created using

1. Historical return sequences;
2. Random selection of historical returns;
3. Random selection of returns from a distribution based on the mean and SD of historical returns;
4. Random short historical sequences (Maurer).

14

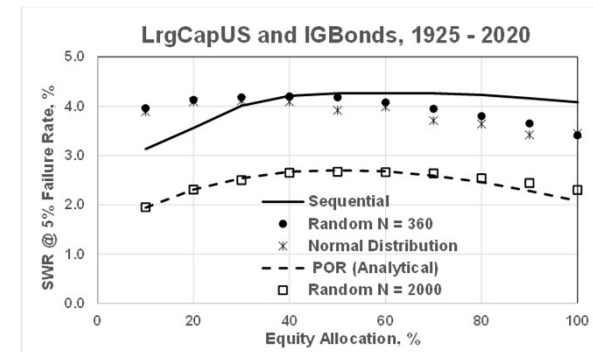
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Sustainable withdrawal rates do not depend of source of the returns. 30-year simulations.



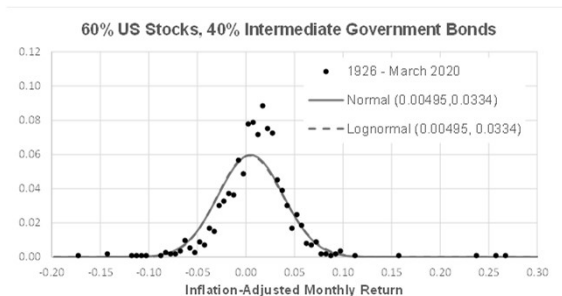
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Sustainable withdrawal rates decrease as the length of the simulation interval increases. The limit at long time horizons is Milevsky's analytical probability of ruin (POR)



17

Monthly inflation-adjusted returns are not normally distributed, but they are apparently normal enough.



16

Milevsky's Analytical POR

- A lognormal return distribution.
- Life expectancy is a parameter.

It is set here at 20 years, about that of a 65 year old.

- Insurance companies and pensions use similar methodologies to estimate the impact of portfolio changes on their financial stability.

18

Random Normal Works for Short Histories.
SBBI database, 60% LrgCapUS, 40% IGBond.

Interval	SWR, Random Historical	SWR, Random Normal
1926 - 1945	3.5%	3.3%
1946 - 1965	5.1%	5.2%
1966 - 1985	2.7%	2.7%
1986 - 2005	5.1%	5.2%
2000 - 2021	3.7%	3.6%

SWR varies among the intervals. Choose an interval which will be characteristic of the future.

Random historical and random normal SWRs are similar.

Clustering and autocorrelation have been neglected (Maurer).

22

22

Changing the Pinkerton's Portfolio to Reduce Volatility and Longevity Risk

2000 - 2021	Original Portfolio	Increase Bonds	QQQ Dilution	SIMPLE RM (47)
Equity Allocation	85%	73%	Tactical	Tactical
CAGR	7.6%	7.0%	8.7%	11.1%
Volatility (mSD)	4.1%	3.3%	2.5%	2.8%
Drawdown	50%	42%	17%	13%
Longevity Risk @ 6% w/d for 25 years (Portfolio Visualizer)	33%	34%	10%	Low

26

26

The Pinkertons

"Allocating to Manage Risk. A Case Study," by Charles Rotblut, AAII Journal, July 2017.

- Retired in 2007. Planned a 4% w/d but panicked in 2008 and locked in a big loss.
- W/D is now 6% and there is a substantial risk of running out of money.
- Increasing bond allocations may reduce the risk of panicking in the next bear market.
- Adding bonds does not address the POR. Adding bonds does not make the portfolio safer.

25

25

Seeking an Easier Dilution Strategy

- Diluting QQQ with IEI each month-end, such that the portfolio dSD equals 0.5%, requires a 2x2 covariance matrix.
- Macquarie and SPVOL Continuous Timers

$$\text{QQQ allocation} = \text{dSD Goal} / \text{dSD of Market}$$
- Macquarie and SPVOL differ in how the market standard deviation is determined.

27

27

Process for Choosing a Strategy

- Choose a benchmark portfolio. E.g., 60:40 portfolio for financial security or SPY for legacy.
- Identify strategies with comparable or better volatilities, substantially better drawdowns and longevity risks, and good relative strengths vs your benchmark.
- Eliminate any with poor Sharpe or UPI.
- Eliminate strategies which are difficult to implement or which involve too many assets or unattractive assets (like long bonds).

28

28

Strategies with good volatility, drawdown and POR tend to also have good Sharpe, UPI and WINS.

2000-2021	60:40	Dilution	Macquarie	SPVOL
Realized dSD	0.0054	0.0054	0.0041	0.0050
maxDD	0.30	0.16	0.09	0.10
POR @ 6% w/d	30%	11%	14%	11%
CAGR	6.1%	8.7%	7.7%	8.6%
Sharpe	0.54	0.84	0.92	0.89
UPI	0.61	1.46	2.61	2.05
WINS36	reference	81%	69%	84%
		Case 65	005NDX105	006SPVolINDX

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The selection criteria are

A volatility comparable to the 60:40 portfolio, dSD ~ 0.5%

Substantially lower bear market risk, maxDD << 30%

Substantially better longevity, POR << 30%.

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POR @ 6% w/d	30%	11%	14%	11%
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Examples of Low Volatility Strategies

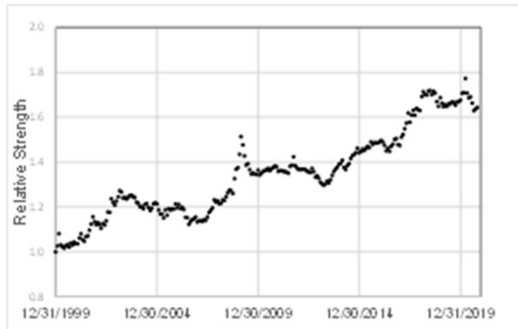
2000-2021	Realized mSD	maxDD	POR @ 6% w/d	Sharpe	UPI	WINS36
60 VOO 40 IEI	0.025	0.30	17%	0.54	0.6	reference
QQQ & IEI timed 006SPVolINDX	0.023	0.10	6%	0.89	2.1	0.84
SIMPLE RM Top2 from VOO VEU VNQ EIE & FISTX using FundX	0.028	0.13	5%	0.98	2.4	0.74
VOO & IEI timed StormGuard Armor	0.027	0.08	1%	1.29	5.6	1.00
VOO & IEI timed SWAG1220 + DR*PR*VOL + IUC	0.028	0.15	6%	0.91	2.4	0.95
VOO & IEI timed 5AbsMom+DR*VOL + IUC	0.028	0.15	7%	0.87	2.2	0.94
S212 N100 at 0.6% dSD	0.025	0.20	6%	0.98	1.3	0.81
Allocate Smartly Strategies. WINS36 values are troubling.						
Kipnis Defensive	0.023	0.09	6%	1.08	3.4	0.57
Protective AA	0.023	0.07	6%	1.06	3.5	0.53
Resilient AA	0.024	0.11	5%	1.06	3.5	0.67

31

31

Relative Strength is the ratio of the equity curve of a strategy to the equity curve of a benchmark. Ideally, RS shows a steady rise over time.

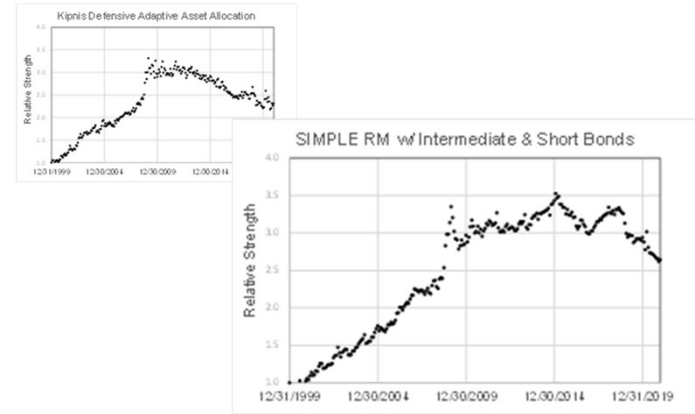
Diluting QQQ with IEI is nearly ideal.



32

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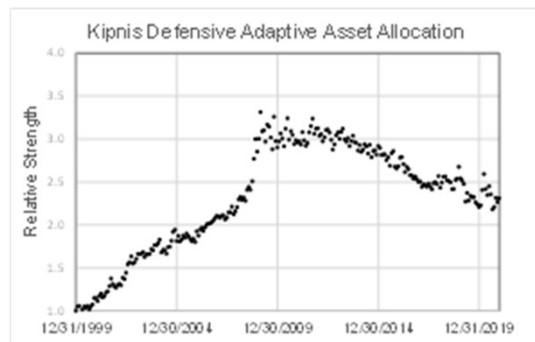
Relative strength for the SIMPLE RM strategy is better, but it is not ideal.



34

34

Allocate Smartly strategies which exhibit moderate volatilities, low drawdowns and low POR don't exhibit ideal relative strength.



33

33

Three Ways to Select a Strategy

1. Choose a risk metric and your personal risk threshold. Identify strategies with the highest returns which satisfy your risk threshold.
2. Choose a benchmark. Identify strategies with comparable volatilities and substantially better drawdowns and risks of ruin. Confirm relative strength.
3. Identify the minimum withdrawal rate you need to sustain your lifestyle. Identify the strategies which provide the largest expected values at death assuming your minimum withdrawal rate.

Eliminate strategies which are difficult to implement or which involve too many or unattractive assets.

35

35

Conclusions

- Utilize short histories by approximating the returns by a distribution.
- Strategies with moderate volatility and low longevity risk are best for financial security.
- Volatile strategies with low longevity risk may be appropriate for those with legacy ambitions.
- Strategies with moderate volatility and low POR tend to have good Sharpe, UPI and WINS36.
- Avoid strategies using long bonds.

36

36

For further reading ...

- William P. Bengen, "Conserving Client Portfolios During Retirement," FPA Press, 2006.
- Moshe A. Milevsky, "The Calculus of Retirement Income," Cambridge University Press, 2006, Eqn 9-4.
- Available at www.lingane.com/qi
 - "Assessing Tactical Strategies Using Short Histories"
 - "Tactical Strategies for Conservative Investors"
 - "Definitions of Algorithms and Timers"
 - "Curated Data"

Thank you for your attention!

37

37