Reliable Market Timers

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AAII Silicon Valley CIMI Group

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Peter Lingane

- Recently retired fee-only financial planner and registered investment advisor.
- A penchant for bringing his considerable analytical skills to tax and investment issues.
- Investment style: recovering buy and hold investor.

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It's Worth Repeating …

- "Trust, but verify!"
- Examples are not recommendations.
- There are no guarantees - other than that future results will be different.

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For detail, www.lingane.com/qi

- Timing and Allocation Algorithms Defined
- Investment Math and Correcting Data
- Curated daily equity curves from 1998
  - Large Cap US stocks
  - Intermediate Treasury Bonds
  - Foreign Developed Markets
  - SmlCap (DFSCX or NAESX and IWM)
  - T-Bills
- "Reliable Market Timers" white paper

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Hedging Market Volatility

- Fixed allocation to bonds.
- Market timing allocates some or all of the equity portfolio to "safe" investments in times of market stress. Timing is the same for all portfolios.
- Dynamic allocation; e.g., Columbus. The portfolio include aggressive and safe options. Each portfolio reacts differently.
- Futures, which I will not be discussing.

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What I will be talking about

- Choosing a benchmark
- What we can learn from managing LrgCapUS stocks over the past ninety years
- Curated equity curves
- Which timer(s) proved reliable for managing LrgCapUS stocks
- Performance with SIMPLE and 27 Fido portfolios
- Dynamic allocation to safe assets in times of market stress

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My Goal is to Identify Better Investment Strategies

Better than the current strategy

- Hedge LrgCapUS with 40% IGBonds
- Your benchmark may be different

Better CAGR, Sharpe, UPI, drawdown

- Rolling 36-month intervals
- Wide variety of market conditions
- Reliability

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What We Can Learn from Managing Large Cap US Stocks from 1927.

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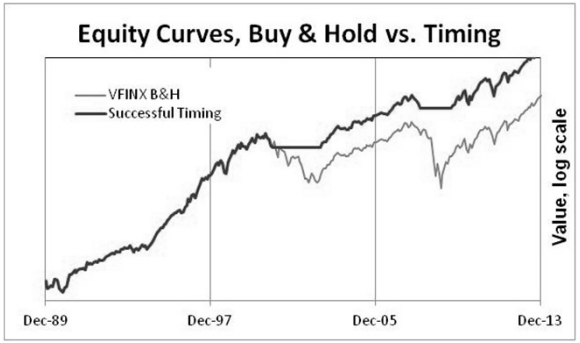
Market timing should provide equity returns in bull markets and corrections and bond returns in bear markets.



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Relative strength is the month-end value of the equity curve of a managed portfolio divided by the corresponding value of the equity curve of the reference portfolio.

The reference portfolio is the unmanaged portfolio or the benchmark.

Relative strength of the managed portfolio should rise during bear markets, since downturns are avoided, and should be flat during bull markets.

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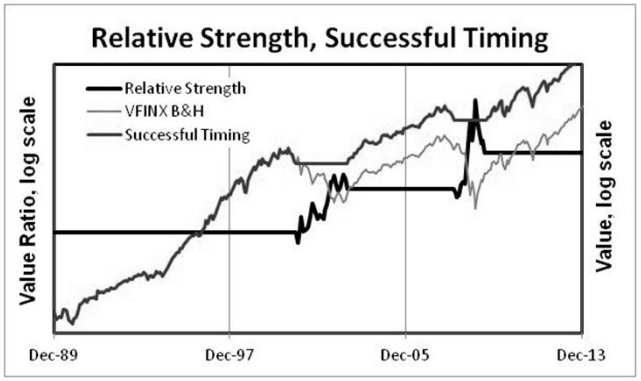

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Nicholas Timing Algorithm

This is a **month-end** indicator, the average of the 1-, 3-. 6- and 12-month returns of a "risk index."

The risk index is SBBI's LrgCapUS stocks: S&P 90 1926-1976 and S&P 500 thereafter with dividends reinvested.

The strategy is to invest in LrgCapUS stocks when the indicator is positive and in IGBonds otherwise.

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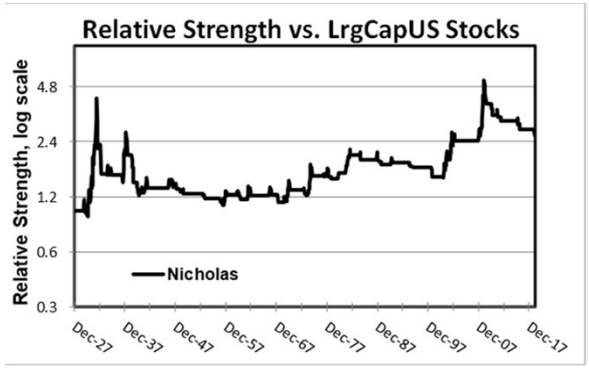
A1

Relative strength rises in bear markets, as expected, but otherwise declines due to whipsaw in market corrections.



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Gradual declines are the "cost" to insure against bear markets.

Timing is a multiyear commitment since the return of the timed portfolio is usually less than the return of the untimed portfolio if the interval does not include a bear market.

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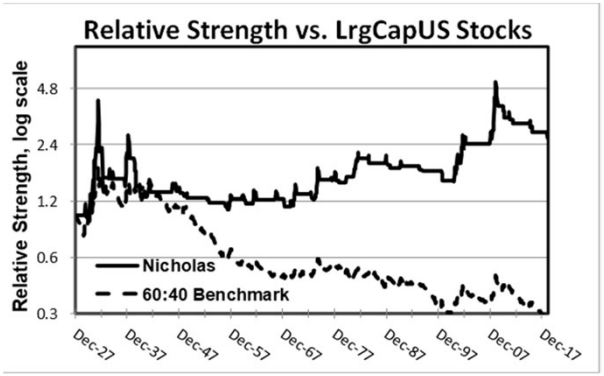
Relative strength declines more with a fixed allocation to bonds. Bonds exact a higher "insurance cost."



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AbsMom is the difference between the 12-month return of LrgCapUS stocks with dividends reinvested and the 12-month return of T-Bills. Bullish if positive.

AbsMom5_1 tests the 5-month and 1-month absolute momentum indicators. Bullish if either indicator is positive.

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AbsMom has the better Sharpe, UPI and maxDD. Is it the better timer?

1927 - June 2019	LrgCapUS, unmanaged	AbsMom Timing	AbsMom5_1 Timing
CAGR	9.8%	10.8%	11.1%
Sharpe	0.42	0.61	0.54
UPI	0.31	0.50	0.43
MaxDD	83% Jun 1932	50% May 1940	67% Mar 1932

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Not necessarily. Traditional statistics are not as informative as might be wished. We needs new stats.

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Reliability Statistics

- WINs – how often the 36-month rolling return of the managed portfolio exceeds the 36-month return of the benchmark.
- Reliability Index – Modified Sharpe. Average monthly return of the managed portfolio minus the average monthly return of the benchmark divided by the standard deviation of the monthly differences.

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WINs and the Reliability Index Suggest that AbsMom5_1 is the Better Timer.

1927 - June 2019	LrgCapUS, unmanaged	AbsMom Timing	AbsMom5_1 Timing
CAGR	9.8%	10.8%	11.1%
Sharpe	0.42	0.61	0.54
UPI	0.31	0.50	0.43
MaxDD	83% Jun 1932	50% May 1940	67% Mar 1932
WINs	68%	70%	77%
Reliability	0.26	0.33	0.48

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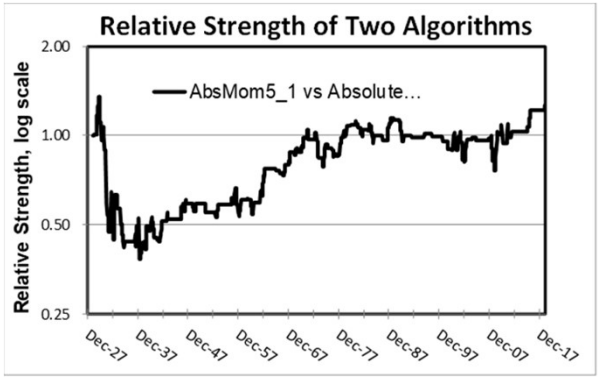
AbsMom5_1 outperforms 1937-1987



It is unlikely that any timer outperforms in all markets.

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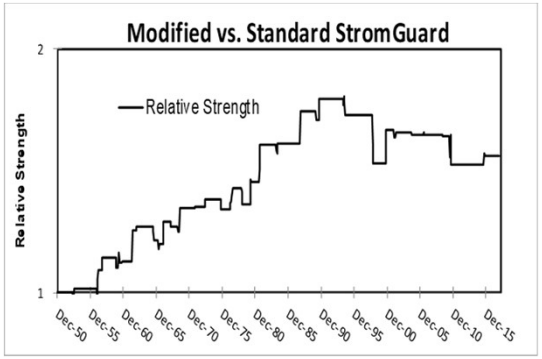
Modified StormGuard outperforms 1955 – 1995



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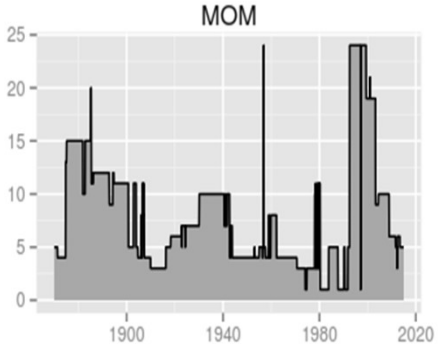
Optimized nMOM Algorithm. Zakamulin, 2015.

Vertical axis is the value of n.



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Composite of AbsMom and AbsMom5_1 is better than AbsMom or AbsMom5_1 alone.

1927 - June 2019	LrgCapUS, unmanaged	AbsMom Timing	AbsMom5_1 Timing	Composite Timing
CAGR	9.8%	10.8%	11.1%	11.1%
Sharpe	0.42	0.61	0.54	0.63
UPI	0.31	0.50	0.43	0.52
MaxDD	83% Jun 1932	50% May 1940	67% Mar 1932	50% Mar 1932
WINs	68%	70%	77%	80%
Reliability	0.26	0.33	0.48	0.47

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Composite Timing Signal

- Equally weighted average of the individual timing signals.

  If the composite is based on three algorithms and one signal is bearish, the composite signal is 67% equities and 33% safe assets.

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- 1926. LrgCapUS, IGBonds and T-bills
- 1950. Daily equity curve and daily volumes of S&P 500 w/o dividends.
- 1970 and 1972. Monthly equity curves for MSCI-EAFE stocks and US REITs, allowing tests with more diversified portfolios.
- 1967. Initial unemployment claims
- 1988 (1978?). NASDAQ Hi Lo
- 1998. Daily curated data
- 1999. Synthetic Delta MSI

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Test Interval Requires Compromise

Data availability defines timer availability

- Test in varied markets with only a few timers; or
- Test in fewer markets with more timers.

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Test Interval Starts December 31, 1967

- Fifty years, three bear markets, seven recessions and extended periods of both rising and falling interest rates.
- Timers based on month-end prices of large cap US stocks with dividends, on daily return, price and volume data of large cap US stocks without dividends and on weekly unemployment claims.
- What about data?

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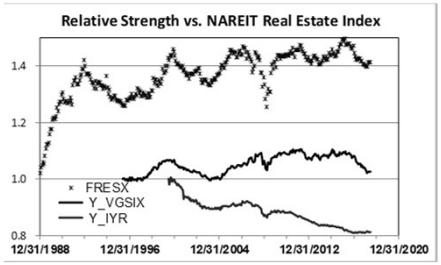
Curated Equity Curves (1998-2019)

- Step 1 is to identify funds which are reasonable extensions of index equity curves.



- FRESX. Actively managed real estate fund.
- VGSIX (corrected). MSCI US REIT Index fund.
- IYR. DJ US Real Estate Index ETF.

Source: Data&Timers.xlsb.

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Curated Equity Curves (1998-2019)

Step 2 is to correct the equity curves.

- Replace Yahoo dividends by those reported at iShares.com, in annual reports (EDGAR) or in Morningstar's FundSource.
- Correct closing prices, where possible, by matching daily returns to underlying index.
- Compute corrected equity curves.
- Daily 4-week T-Bill returns from FRED

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Impact of Curated Equity Curves

Extending his May 2019 CIMI presentation *Weights for 1.3.6.12 Momenta*, Ren Curry observes that

"The momentum weights changed dramatically when switching to curated data."

- e-mail, September 23, 2019

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Part I. What We Learned

- Timing reduces drawdowns but underperforms during bull markets.
- Timing has a lower "insurance cost" than a fixed allocation to bonds.
- Traditional stats need to be supplemented by relative strength, WINs and reliability.
- Composites are more reliable than individual timing algorithms.
- Backtesting from 1968 is a reasonable compromise.

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Part II. Reliable Timer for Large Cap US Stocks, 1968 - 2019

- More than thirty timers were evaluated for relative strength and performance stats.
- Only the better timers are discussed here, but results for all timers are reported in "Reliable Market Timers."
- Fifty years from 1968, the first thirty years and the subsequent twenty years.

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Composite Timer Elements

- AbsMom5_1.
- SPVOL. Reduces equity allocation when S&P 500 volatility exceeds 18% annually.
- DR*VOL. Bullish when the DEMA50 of the daily return of the S&P 500, times its daily volume, is positive. Also, DR*PR*VOL.
- IUC. Bullish when number of seasonally adjusted initial US unemployment claims is less than the 22-week SMA ± a tolerance.

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Top Managed Portfolios

Ranked by Reliability Index. maxDD excludes 1987.

Source: Monthly Allocations Sep 2019.xlsb ∎

1968 – Sept. 2019	60:40 Benchmark	AbsMom5_1 DR*VOL IUC	SPVOL DR*VOL IUC	AbsMom5_1 DR*VOL
CAGR	9.0%	12.2%	11.5%	12.3%
Sharpe	0.48	0.67	0.59	0.67
UPI	0.72	1.32	0.99	1.37
MaxDD	30%	24%	29%	21%
WINs	Reference	84%	83%	86%
Reliability	Reference	0.54	0.50	0.49

SPVOL shows we need reliability AND good stats.

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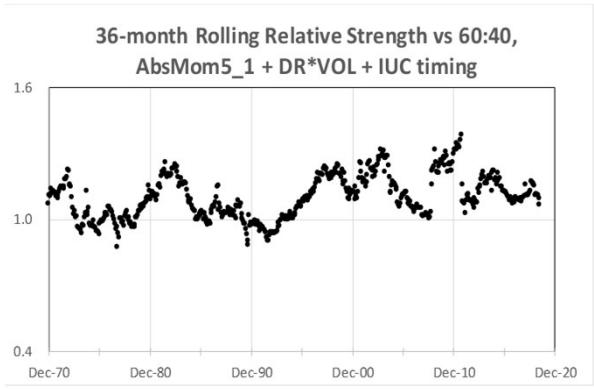
First 30 years were challenging. Scarcity of bear markets?



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Top 3 of 31 Managed Portfolios; First Thirty-one Years.

Most reliable timer is same as 1968-2019 interval; second and third ranked timers are different.

Source: Monthly Allocations Sep 2019.xlsb

1968 - 1998	60:40 Benchmark	AbsMom5_1 DR*VOL IUC	AbsMom5_1	OOPS! 2-1-1-1
CAGR	11.3%	13.4%	14.0%	13.9%
Sharpe	0.47	0.56	0.58	0.56
UPI	0.94	0.99	1.17	1.01
MaxDD	26%	24%	20%	23%
WINs	Reference	72%	71%	77%
Reliability	Reference	0.40	0.40	0.39

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"Golden Age of Market Timing"

StormGuard® Armor is best. AbsMom5_1 + DR*PR*Vol + IUC ranks second.

Source: Monthly Allocations Sep 2019.xlsb

1999 – Sept. 2019	60:40 Benchmark	StormGuard Armor	AbsMom5_1 DR*PR*VOL IUC	AbsMom5_1 DR*VOL IUC
CAGR	5.8%	13.5%	10.7%	10.5%
Sharpe	0.51	1.25	0.91	0.90
UPI	0.54	5.53	2.44	2.38
MaxDD	30%	8%	12%	12%
WINs	Reference	100%	100%	100%
Reliability	Reference	0.83	0.77	0.74

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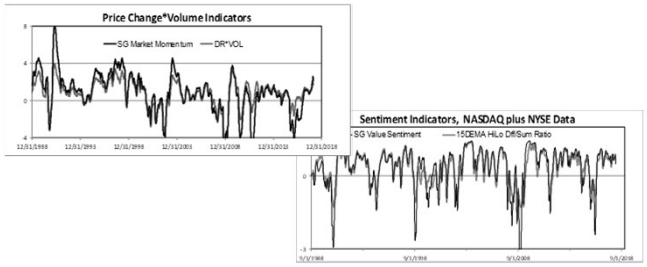
What We Know About Armor

Armor is a COMPOSITE of StormGuard Standard and of algorithms similar to DR*VOL and NHiLo. I have been able to reproduce only 90% of the SG signals.



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What We Know About Armor

- The three algorithms are linked by "fuzzy logic" rather than by mathematical formulas.
- There were 12 "rules." Juds has increased the number of rules to 14 currently.

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Guessing as to the Fuzzy Rules

Scott Jud's September 9, 2019 communication discussed what it would take for Armor to turn bullish.

- The "Drop and Pop" test requires a strong rebound from a near-term low within a 10-day window.
- A six-week high 5% higher than the current market level, or a seven-week high at about the current market level .
- Armor will turn bullish if both the Momentum and Sentiment components are rising by the end of September.

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AI for Better Composite Timers

- We developed curated data sets and reliable timing strategies which outperform.
- Meanwhile, Juds developed Armor – which appears better than any other composite algorithm - and moved beyond.

  Juds' "Under the Hood of Merlyn AI" presentation is sobering. Search or www.youtube.com/watch?v=hsrfL2lR2EQ&feature=youtu.be
- CIMI should enlarge its focus; we have reached the point of diminishing returns.

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Timing LargeCapUS Stocks, Conclusions

- Composites of the AbsMom5_1 and IUC algorithms, plus either the DR*VOL or DR*PR*VOL algorithms, exhibit a high CAGR, Sharpe ratio, UPI and reliability.
- Algorithms should be tested before 1994.
- It is time for CIMI to enlarge the focus of its timer research.

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III. The SIMPLE Strategy

- Allocate to the top 2 from among LargeCapUS, foreign stocks and real estate by averaging the rankings of the FundX and DEMA20 allocation algorithms.

	FundX Ranking	DEMA20 Ranking	Average Ranking	Ensemble Ranking
Fund A	1	3	2.0	2
Fund B	2	1	1.5	1
Fund C	3	2	2.5	3

- Layer market timing on top.

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Simple Strategy

Curated equity curves, FundX/DEMA20 ensemble allocation, top2. Ranked by reliability index.

Source: SmlOutput10012019.xlsx.

1999 - Sep. 2019	60:40 Benchmark	Armor	AbsMom5_1 DR*PR*VOL IUC	AbsMom5_1 DR*VOL IUC
CAGR	5.7%	15.9%	13.5%	13.2%
Sharpe	0.50	1.44	1.14	1.13
UPI	0.54	6.72	2.96	2.91
MaxDD	30%	9%	14%	14%
WINs	Reference	100%	100%	100%
Reliability	Reference	0.91	0.93	0.90
Rank		1 of 32	2	3

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Part IV. Fidelity Select Strategy

- 27 Fidelity Select Funds. Equity curves from 1988, focus on one market sector. Gold and precious metals excluded.
- Ensemble allocation to identify the top 3 trending funds, plus market timing.
- Neglect Fidelity's 30-day minimum hold.

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Fidelity Select Strategy

Armor is less dominant than with the simpler portfolios. "Reliable timers" rank 3 and 5.

Source: SmlOutput10012019.xlsx.

1999 - Sep 2019	60:40 Benchmark	Armor	SWAG (1-2-2-0)	AbsMom5_1 DR*PR*VOL IUC
CAGR	5.8%	19.6	18.8%	17.9%
Sharpe	0.51	1.06	1.01	0.94
UPI	0.54	4.00	3.50	3.11
MaxDD	30%	23%	18%	22%
WINs	Reference	100%	98%	100%
Reliability	Reference	0.84	0.79	0.78
Rank		1	2	3

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Part V. Dynamic Allocation.

- Added six bond funds: VFSTX, VWEHX, IGBonds, VFIIX, VUSTX and VWESX
- No market timing
- FundX, DEMA20 or Ensemble allocation.
- Benchmark: 60% LrgCapUS and 40% IGBonds.

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LrgCapUS w/ Six Bond Funds

Allocate to top 1 of 7 funds, no timing
Better CAGR, Sharpe, UPI and maxDD.

Source:SmlOutput10012019.xlsx

1999 – Sept. 2019	60:40 Benchmark	+ Six Bonds, FundX Allocation	+ Six Bonds, Ensemble Allocation	+ Six Bonds, DEMA20 Allocation
CAGR	5.8%	7.6%	7.2%	7.1%
Sharpe	0.51	0.57	0.58	0.53
UPI	0.54	0.99	1.08	0.84
MaxDD	30%	22%	17%	19%
WINs	Reference	65%	62%	55%
Reliability	Reference	0.17	0.14	0.13

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LrgCapUS w/ Timing or Six Bond Funds. Dynamic allocation ranks below timing in performance and reliability.

Source:SmlOutput10012019.xlsx

1999 – Sept. 2019	AbsMom5_1 DR*PR*VOL IUC Timing, Ensemble Allocation	+ Six Bonds, FundX Allocation	+ Six Bonds, Ensemble Allocation	+ Six Bonds, DEMA20 Allocation
CAGR	10.7%	7.6%	7.2%	7.1%
Sharpe	0.91	0.57	0.58	0.53
UPI	2.45	0.99	1.08	0.84
MaxDD	12%	22%	17%	19%
WINs	100%	65%	62%	55%
Reliability	0.77	0.17	0.14	0.13
Rank	2 of 32	30	31	32

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SIMPLE w/ Six Bond Funds

Allocate to top 2 of 9 funds, no timing.
Generally, better CAGR, Sharpe, UPI and maxDD.

Source:SmlOutput10012019.xlsx

1999 – Sept. 2019	60:40 Benchmark	+ Six Bonds, FundX Allocation	+ Six Bonds, Ensemble Allocation	+ Six Bonds, DEMA20 Allocation
CAGR	5.8%	11.5%	9.4%	10.3%
Sharpe	0.51	0.95	0.55	0.78
UPI	0.54	1.94	0.51	1..52
MaxDD	30%	18%	26%	13%
WINs	Reference	80%	91%	87%
Reliability	Reference	0.52	0.45	0.43

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SIMPLE w/ Timing or Bond Funds.

Dynamic allocation ranks below timing in performance and reliability.

Source:SmlOutput10012019.xlsx

1999 – Sept. 2019	AbsMom5_1 DR*PR*VOL IUC Timing, Ensemble Allocation	+ Six Bonds, FundX Allocation	+ Six Bonds, Ensemble Allocation	+ Six Bonds, DEMA20 Allocation
CAGR	13.5%	11.5%	9.4%	10.3%
Sharpe	1.14	0.95	0.55	0.78
UPI	2.96	1.94	0.51	1..52
MaxDD	14%	18%	26%	13%
WINs	100%	80%	91%	87%
Reliability	0.93	0.52	0.45	0.43
Rank	2	28	30	31

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Fidelity Select w/ Six Bond Funds

Allocate to top 3 of 33 funds; no timing. Generally, better CAGR, Sharpe, UPI and drawdown. Source: SmlOutput10012019.xlsx.

1999 - Sep 2019	No Bonds, No Timing	+ 6 Bond Funds, Dema20 Allocation	+ 6 Bond Funds, Ensemble Allocation	+ 6 Bond funds, FundX Allocation
CAGR	13.8%	14.5	14.5%	11.9%
Sharpe	0.64	0.71	0.71	0.59
UPI	0.96	1.21	1.42	0.61
MaxDD	53%	37%	26%	39%
WINs	86%	85%	96%	84%
Reliability	0.55	0.56	0.55	0.42

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Fidelity Select w/ Timing or Six Bond Funds. Allocation to top 3.

Dynamic allocation ranks below timing in performance and reliability. Source: SmlOutput10012019.xlsx.7.9

1999 - Sep 2019	AbsMom5_1 DR*PR*VOL IUC Timing, Ensemble	+ 6 Bond Funds, Dema20 Allocation	+ 6 Bond Funds, Ensemble Allocation	+ 6 Bond funds, FundX Allocation
CAGR	17.9%	14.5	14.5%	11.9%
Sharpe	0.94	0.71	0.71	0.59
UPI	3.11	1.21	1.42	0.61
MaxDD	22%	37%	26%	39%
WINs	100%	85%	96%	84%
Reliability	0.78	0.56	0.55	0.42
Rank	3	30	31	32

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On Adding Six Bond Funds to the LrgCapUS, SIMPLE and Fidelity Select Portfolios

Dynamic allocation produces higher returns and lower drawdowns than the 60:40 benchmark or untimed portfolio, but the performance stats are inferior to timing with the "reliable" composite timer.

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Timing Accuracy is Only 60%

An algorithm is "accurate"

- When the algorithm recommends a full or partial allocation to large cap US stocks and the portfolio return over the following month exceeds the safe asset return;
- Or, when the algorithm recommends a full allocation to safe assets and the portfolio return over the following month exceeds the return of large cap US stocks.

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But 60% Accuracy Is Enough

Random allocation, plus a bias, between LrgCapUS and IGBonds, 1968 - Jun 2019 monthly returns, average of 1000 simulations.

Accuracy	CAGR	Sharpe	UPI	MaxDD
47%	7.4%	0.35	0.45	26%
50% (random)	8.7%	0.50	0.76	25%
60:40 Benchmark	9.0%	0.48	0.62	30%
53%	10.3%	0.65	1.20	22%
AbsMom5_1 + DR*VOL + IUC	12.3%	0.67	1.11	24%
56%	11.3%	0.79	1.77	20%
58%	12.2%	0.90	2.26	18%

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Conclusions

- Timing algorithms are only slightly more accurate than random guessing.
- Timing reduces drawdowns but underperforms during bull markets.
- Timing has a lower "insurance cost" than a fixed allocation to bonds.
- Reliable strategies

  Exhibit good traditional statistics;

  Frequently exceed the benchmark return over rolling 36-month intervals; and

  Have high reliability indices.

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Conclusions

- Composite timers tend to be are more reliable than individual algorithms.
- The AbsMom5_1 + DR*VOL + IUC composite (and its cousin DR*PR*VOL) exhibit high CAGRs, Sharpe ratios, UPIs and reliability indices in a variety of market conditions with a variety of portfolios.
- StormGuard® Armor provides exceptional performance in the post-1998 interval.
- Dynamic allocation with safe assets improves performance, but not as much as market timing.

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Implications for CIMI

- Algorithms should be tested prior to the mid-1990s.
- It is possible to winnow the number of timing and allocation algorithms that CIMI follows.
- Fuzzy logic might allow CIMI to test Armor's performance under more challenging market intervals.

  It might even be possible to develop more effective timing and allocation composites.

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