AAII Model Shadow Stock Portfolio: Annual Review

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AAII Model Shadow Stock Portfolio

- Present research and theory behind the strategy
- Present model portfolio construction and management rules
- Review Model Shadow Stock and market performance
- Highlight AAII resources to follow the approach including the current portfolio holdings and ideas list

Shadow Stock Origin Story

- January 1993 AAII Journal: Thinly Traded Stocks: Putting a Practical Approach to the Test by James Cloonan
- The Model Shadow Stock Portfolio developed from an attempt to codify the lessons of academic studies into a set of practical portfolio selection and trading rules that an individual investor could follow with minimal effort
- The portfolio has allowed us to share the problems and procedures of managing a portfolio of small stocks using a quantitative approach

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Primary Size Consideration: Market Capitalization

- Market Capitalization (Market Cap): Price per share times the number of shares outstanding
- Common measure of company size
- Represents public consensus of a company's net worth

Performance by Market Cap

Decile	Annual Return (%)	Average Return (%)	Standard Deviation (%)	Return Above Decile 1	No. of Firms	Largest Stock	% of Total Market Cap	% of Total Cos
	1926 to 2021							
1-Largest	9.8	11.5	18.7	--	227	$2,324.4 bil	73.3	6.6
2	10.9	13.0	21.1	1.1	224	$36.10 bil	11.2	6.6
3	11.2	13.7	22.9	1.4	227	$16.74 bil	5.5	6.6
4	11.0	13.8	25.1	1.2	252	$8.21 bil	3.3	7.4
5	11.5	14.5	25.7	1.7	276	$5.00 bil	2.3	8.1
6	11.5	14.8	26.6	1.7	292	$3.28 bil	1.6	8.6
7	11.9	15.5	28.5	2.1	328	$2.16 bil	1.2	9.6
8	11.4	15.8	32.2	1.6	468	$1,306 mil	0.9	13.7
9	11.7	16.9	36.3	1.9	469	$627.8 mil	0.5	13.7
10-Smallest	**13.4**	**20.0**	**41.5**	**3.6**	**651**	**$289.0 mil**	**0.2**	19.1
Large Cap, S&P 500	10.5	12.3	19.6		500	$2,324.4 bil	84.5	14.6
Mid Cap, Deciles 3-5	11.2	13.9	23.9		755	$16.74 bil	11.2	22.1
Small Cap, Deciles 6-8	11.6	15.2	28.1		1,088	$3.28 bil	3.7	31.9
Micro Cap, Deciles 9-10	12.3	17.9	37.9		1,120	$627.8 mil	0.7	32.8
Treasury Bills	3.3	3.3	3.1					
Inflation	2.9	3.0	4.0					

Past performance is no guarantee of future results.
Source: Duff & Phelps, Morningstar, CRSP

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Time Frame and Performance

Holding Period	Small Cap Outperform	Large Cap Outperform	Small Cap Outperform	Large Cap Outperform
	Percentage of Holding Periods That Resulted in Better Performance			
	(1926 to 2019)		(2000 to 2019)	
1 Month	50% (563)	50% (565)	52% (125)	48% (115)
5 Year	56% (598)	44% (471)	59% (106)	41% (75)
10 Year	68% (686)	32% (323)	74% (89)	26% (32)
20 Year	88% (779)	12% (110)	100% (1)	0% (0)
30 Year	96% (740)	4% (29)		

Source: Morningstar, "Stocks, Bonds, Bills and Inflation," Chicago.

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Time Frame and Performance

(Rolling Periods 1993 - 2022)

Holding Period	Percentage of Holding Periods That Resulted in Better Performance: Model Shadow Stock Outperformed	S&P 500 Outperformed
1 Month	53% (189)	48% (171)
1 Year	55% (191)	45% (158)
3 Year	51% (165)	49% (160)
5 Year	64% (192)	36% (109)
10 Year	85% (205)	15% (36)
15 Year	90% (163)	10% (18)
20 Year	100% (121)	0% (0)

Past performance is no guarantee of future results.

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Model Portfolio Primary Size Consideration: Market Capitalization

- Investable universe: Domestic stocks in the lowest 10% of market cap as defined by NYSE-listed companies
  - NYSE-listed stocks used to establish market cap levels
- Currently buy NYSE, Nasdaq and Amex-listed stocks with market cap below $300 million
  - Original cutoff: $55 million in 1993
  - Highest cutoff: $500 million (June 2021-Feb 2022)
  - Current cuttoff: $300 million since December 2022

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Secondary Size Consideration: Liquidity

- Only interested in stocks that have an adequate market for us to take a position
  - Avoid stocks in danger of being delisted
- Currently buy stocks with a minimum market cap of $30 million
  - Original minimum of $10 million in 1993
  - Current minimum of $30 since December 2012
- No OTC stocks (bulletin board or pink sheets)

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Primary Value Consideration: Price-to-Book-Value Ratio

- Book Value = Assets – Liabilities
  - Also called shareholder's equity
- Price-to-Book Value: Relates market's assessment of company's net worth to accounting measure of company's net worth
- Financial structures of all industries not comparable; most studies with book value exclude financial stocks
  - Shadow Stock Portfolio excludes financial sector

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Primary Value Consideration: Price-to-Book-Value Ratio

- Book value based on historical accounting measures
  - Items of real and substantial value may not appear on the balance sheet (i.e., customer loyalty, copyrights, patents, etc.)
  - Historical, depreciated value of items carried on book may not reflect the current market value or replacement value
  - Share repurchases may also lower book value

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Primary Value Consideration: Price-to-Book-Value Ratio

Average Monthly Returns (July 1963 to December 1990) (%)

		High				Price-to-Book-Value Ratio					Low
	All	1	2	3	4	5	6	7	8	9	10
All Stocks	1.23	0.64	0.98	1.06	1.17	1.24	1.26	1.39	1.40	1.50	1.63
Size Deciles											
1-Largest	0.89	0.93	0.88	0.84	0.71	0.79	0.83	0.81	0.96	0.97	1.18
2	0.95	0.44	0.89	0.92	1.00	1.05	0.93	0.82	1.11	1.04	1.22
3	1.08	0.66	1.13	0.91	0.95	0.99	1.01	1.15	1.05	1.29	1.55
4	1.07	0.95	1.00	0.99	0.83	0.99	1.13	0.99	1.16	1.10	1.47
5	1.15	0.70	0.98	1.14	1.23	0.94	1.27	1.19	1.19	1.24	1.50
6	1.24	0.88	0.65	1.08	1.47	1.13	1.43	1.44	1.26	1.52	1.49
7	1.19	0.39	0.72	1.06	1.36	1.13	1.21	1.34	1.59	1.51	1.47
8	1.22	0.56	0.88	1.23	0.95	1.36	1.30	1.30	1.40	1.54	1.60
9	1.22	0.43	1.05	0.96	1.19	1.33	1.19	1.58	1.28	1.43	1.79
10-Smallest	1.47	0.70	1.14	1.20	1.43	1.56	1.51	1.70	1.71	1.82	1.92

Source: The Cross-Section of Expected Stock Returns, Eugene Fama & Kenneth French, The Journal of Finance, June 1992

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Primary Value Consideration: Price-to-Book-Value Ratio

- Price-to-book-value ratio works because, on average, over a number of companies and a number of years, accounting book value is a “close-enough” estimate of economic value
- The smaller the market cap, the higher the future return

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Primary Value Consideration: Price-to-Book-Value Ratio

- The lower the price-to-book ratio, the higher the future return
  - Ratio worked well independently and with small caps
  - Fama-French Study: Price-to-book ratio better predictor than price-earnings ratio

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Model Portfolio Primary Value Consideration: Price-to-Book-Value Ratio

- Buy stocks with price-to-book-value ratio in the bottom 10%
  - Currently, maximum P/B is 0.90
    - Original cutoff of 0.61 in 1993
    - Lowest cutoff of 0.60 from August 2000 to October 2003
    - Highest cutoff of 1.10 from June 2021 to February 2022
  - Median P/B of S&P 500:
    - Currently (12/2022): 3.25; Year Ago (12/2021): 4.11

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Levels of Key Factors Over Time

Size and Value Maximums Used for the Model Shadow Stock Portfolio

Period Ending	Maximum Value of Lowest (10th) NYSE Decile: Market Cap ($ Mil)	Maximum Value of Lowest (10th) NYSE Decile: Price-to-Book-Value (X)	Maximum Values for Shadow Stock Candidates: Market Cap ($ Mil)	Maximum Values for Shadow Stock Candidates: Price-to-Book-Value (X)	Maximum Values for Shadow Stock Candidates: Price-to-Sales (X)
Jun 1993	60	0.85	55	0.61	--
Dec 1993	66	0.99	55	0.61	--
Dec 1994	60	0.87	60	0.65	--
Dec 1995	81	0.95	60	0.65	--
Dec 1996	93	1.01	100	0.70	0.54
Dec 1997	123	1.13	125	0.85	0.54
Dec 1998	100	0.82	125	0.85	1.00
Dec 1999	95	0.65	125	0.85	1.00
Dec 2000	90	0.50	125	0.85	1.00
Dec 2001	115	0.73	125	0.60	1.00
Dec 2002	130	0.68	125	0.60	1.00
Dec 2003	243	1.02	125	0.70	1.20
Dec 2004	300	1.20	200	0.80	1.20
Dec 2005	310	1.09	200	0.80	1.20
Dec 2006	380	1.19	200	0.80	1.20
Dec 2007	303	0.84	200	0.85	1.20
Dec 2008	127	0.52	200	0.80	1.20
Dec 2009	230	0.79	200	0.80	1.20
Dec 2010	287	0.93	200	0.80	1.20
Dec 2011	238	0.76	200	0.80	1.20
Dec 2012	266	0.85	240	0.80	1.20
Dec 2013	385	1.06	300	0.80	1.20
Dec 2014	326	0.94	300	0.80	1.20
Dec 2015	249	0.77	300	1.00	1.20
Dec 2016	370	1.04	400	1.00	1.20
Dec 2017	387	1.00	400	1.00	1.20
Dec 2018	276	0.72	400	1.00	1.20
Dec 2019	280	0.82	300	0.90	1.20
Dec 2020	300	0.97	300	1.00	1.20
Mar 2021	370	1.02	400	1.00	1.20
Jun 2021	470	1.11	500	1.10	1.20
Aug 2021	460	1.06	500	1.10	1.20
Nov 2021	479	1.04	500	1.10	1.20
Mar 2022	429	0.90	400	0.90	eliminated
Jun 2022	383	0.89	400	0.90	
Sep 2022	330	0.88	350	0.90	
Dec 2022	300	0.84	300	0.90	

Source: Kenneth R. French, AAII's Stock Investor Pro. Data as of 12/31/2022.

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Model Shadow Stock Financial Considerations

- Positive earnings from continuing operations over the last quarter and trailing 12 months (last 4 quarters)
  - When available, consensus estimates must also be positive for current quarter and year
- Avoid any stock that was sold from the portfolio in the last two years
  - Avoid marginal stocks that are forever marginal, creating high transaction costs
  - Avoid cyclical stocks going from profits, to losses, to profits, etc.

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Model Shadow Stock Financial Considerations

- Avoid stocks not listed on U.S. exchanges and Chinese firms
  - Potential for different accounting procedures
  - Withholding taxes on dividends
- Avoid financial stocks, leasing & rental companies, REITs & limited partnerships, etc.
  - High levels of acceptable liabilities make it difficult to make meaningful comparisons of popular ratios
- Avoid companies that have not filed a quarterly SEC report (10-Q) in last six months

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Portfolio Construction

- 10-stock portfolio: minimum number of holdings
- 15 to 20 stocks: $100,0000 to $1 million
- 25+ stocks: Over $1 million
- Try to invest equal dollar amounts in each security
- If building a portfolio slowly by adding stocks over time, try to establish positions that will represent desired portfolio percentage

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- Home page for AAII Mode Shadow Stock Portfolio

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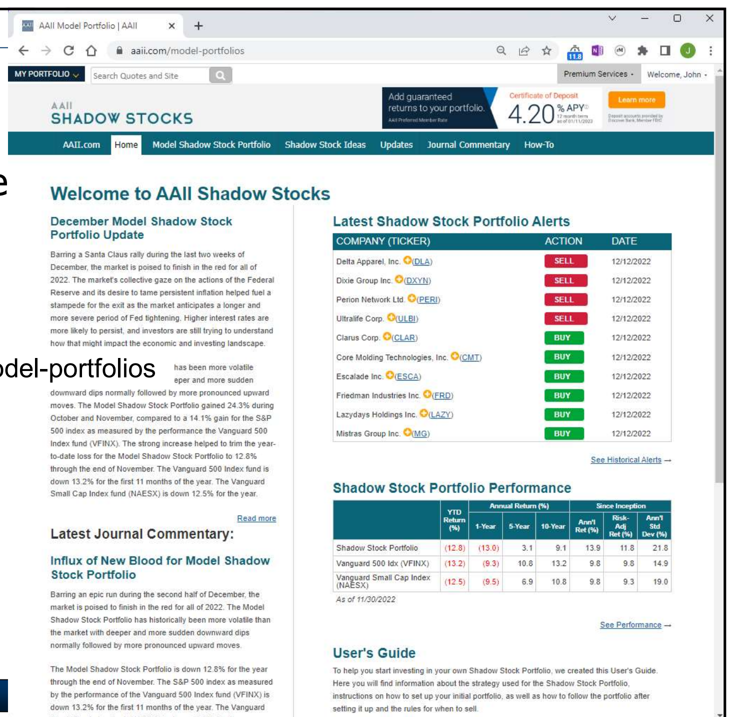

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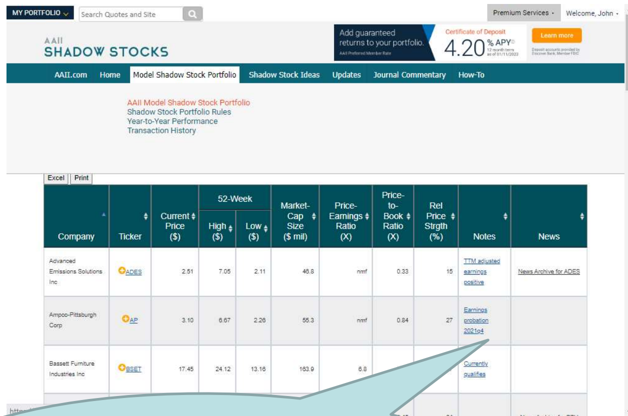
Actual AAII Model Shadow Stock Portfolio

- "Actual Portfolio" section updated monthly & lists current portfolio holdings
- Current price to book & market cap
- Special notes (e.g., currently qualifies, earnings probation)



Pay attention to notes about current qualifiers, earnings probation, valuation & market cap

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Current AAII Model Portfolio

Company	Ticker	Price ($)	52-Week High ($)	52-Week Low ($)	Market-Cap ($ mil)	P/Earnings Ratio (X)	P/Book Ratio (X)	Rel Price Strgth (%)	Notes
SigmaTron International Inc	SGMA	$4.10	$10.28	$3.63	$24.0	nmf	0.27	12	TTM adjusted earnings positive
Advanced Emissions Solutions Inc	ADES	$2.51	$7.05	$2.11	$46.8	nmf	0.33	15	TTM adjusted earnings positive
Key Tronic Corporation	KTCC	$4.65	$6.54	$4.00	$49.5	13.6	0.39	66	Currently qualifies
Beazer Homes USA Inc	BZH	$14.03	$22.50	$9.47	$427.3	1.9	0.45	64	
Strattec Security Corp.	STRT	$23.60	$44.30	$19.20	$91.9	12.7	0.47	26	Currently qualifies
Container Store Group Inc	TCS	$5.10	$11.10	$3.89	$244.5	4.0	0.56	26	Currently qualifies
Lazydays Holdings Inc *	LAZY*	$12.74	$22.48	$11.25	$134.7	2.4	0.60	62	Currently qualifies
VOXX International Corp	VOXX	$9.85	$13.34	$5.85	$217.1	nmf	0.65	91	TTM adjusted earnings positive
NACCO Industries, Inc.	NC	$38.03	$63.19	$28.42	$280.1	4.1	0.67	43	Currently qualifies
Friedman Industries Inc *	FRD*	$10.23	$12.00	$6.74	$74.0	70.8	0.69	88	Currently qualifies
Global Ship Lease Inc	GSL	$17.53	$30.02	$14.62	$630.7	2.3	0.69	74	
Big 5 Sporting Goods Corp	BGFV	$9.62	$21.40	$8.36	$205.0	4.8	0.76	30	Currently qualifies
Hurco Companies, Inc.	HURC	$28.40	$35.15	$21.75	$178.0	22.1	0.80	72	Currently qualifies
Mistras Group Inc *	MG*	$5.02	$7.54	$3.38	$149.5	43.9	0.80	32	Currently qualifies
Pangaea Logistics Solutions Ltd	PANL	$5.59	$7.05	$3.60	$244.8	3.1	0.80	80	Currently qualifies
Ampco-Pittsburgh Corp	AP	$3.10	$6.67	$2.26	$55.3	nmf	0.84	27	Earnings probation 2021q4
Bassett Furniture Industries Inc	BSET	$17.45	$24.12	$13.16	$163.9	6.8	0.84	27	Currently qualifies
Fonar Corporation	FONR	$18.99	$19.32	$13.28	$127.6	13.1	0.84	81	Currently qualifies
Clarus Corp *	CLAR*	$8.71	$29.32	$6.86	$314.8	13.2	0.87	9	
Hooker Furnishings Corp	HOFT	$20.03	$23.70	$12.90	$222.4	24.9	0.88	79	Currently qualifies
Rocky Brands Inc	RCKY	$28.37	$48.91	$18.00	$205.2	7.8	0.98	37	
Core Molding Technologies, Inc. *	CMT*	$13.70	$13.83	$7.96	$121.1	14.7	1.04	91	
Escalade Inc *	ESCA*	$12.03	$16.53	$9.25	$158.5	8.1	1.04	43	
Ducommun Inc	DCO	$55.40	$58.18	$38.89	$635.4	5.0	1.27	83	
Kimball Electronics Inc	KE	$23.13	$25.39	$16.66	$598.7	11.0	1.31	84	
Covenant Logistics Group Inc	CVLG	$35.50	$40.37	$17.23	$456.6	4.9	1.35	89	
VSE Corporation	VSEC	$50.60	$59.20	$31.85	$627.6	21.9	1.44	93	
Ennis Inc	EBF	$21.79	$23.48	$16.55	$560.1	13.5	1.78	67	
Titan Machinery Inc.	TITN	$42.14	$44.35	$21.50	$933.3	9.1	1.86	97	Exceeds size limit
Vishay Precision Group Inc	VPG	$40.50	$41.63	$27.03	$549.6	16.8	1.94	92	

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Shadow Stock Ideas

We run AAII's Shadow Stock selection methodology daily against a universe of over 6,000 stocks to uncover specific companies that meet our selection criteria.

Ordered By: Rel Price Strgth

Passing Companies as of 1/10/2023.
Data delayed 15 min.

Excel | Print

Company	Ticker	Current Price ($)	52-Week High ($)	52-Week Low ($)	Market-Cap Size ($ mil)	Price-Earnings Ratio (X)	Price-to-Book Ratio (X)	Rel Price Strgth (%)	Industry	Held in Tracking Portfolio
Friedman Industries Inc	FRD	10.21	12.00	6.74	74.0	70.80	0.69	88	Metals & Mining - Iron & Steel	✓
	FONR	18.99	19.32	13.28	127.6	13.10	0.84	81	Advanced Medical Equipment & Technology	✓
	SCX	8.14	10.69	6.26	61.1	4.40	0.59	80	Industrial Machinery & Equipment	
	PANL	5.59	7.05	3.60	244.8	3.10	0.80	80	Freight & Logistics - Marine	✓
	HOFT	20.03	23.70	12.90	222.4	24.90	0.88	79	Home Furnishings	✓
	UONEK	4.47	6.99	3.10	217.8	5.70	0.78	78	Broadcasting	
	HURC	28.40	35.15	21.75	178.0	22.10	0.80	72	Industrial Machinery & Equipment	✓
	EDRY	17.30	44.99	12.71	49.9	1.20	0.47	69	Freight & Logistics - Marine	
	KTCC	4.65	6.54	4.00	49.5	13.60	0.39	66	Computer Hardware	✓
	AXR	11.99	16.72	9.88	63.8	4.50	0.71	65	Construction & Engineering	
Capital Product Partners L.P.	CPLP	14.10	19.65	12.80	270.5	1.90	0.43	64	Oil & Gas - Transportation Services	

- "Shadow Stock Ideas" list is updated **daily** and lists all stocks currently passing initial buy rules
- You will need to monitor any stocks purchased from this list since they may not be part of our model portfolio

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Knowing When to Sell

- Sell process just as important as buy process
- Investors tend to sell winning positions too quickly & hold onto losing positions for too long
  - Investors hate to give up some of the gain from a winner and would rather lock in a small profit than hold on for larger gain, but risk giving up some of the profit
  - Investors like to hold onto losing positions to try and break even

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Knowing When to Sell

- Rules help to overcome emotions
  - Sell when stock is no longer attractive and better opportunities are available
  - Consider rebalancing when positions put portfolio way out of balance
  - Shadow Stock Portfolio sell rules (value & size) normally keep positions from getting too large for very long

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Shadow Stock Portfolio Sell Rules

- **Price-to-book-value ratio > 3x** current buy factor
  - 3 × 0.9 = 2.7
  - Sell if there are suitable replacements
- **Market cap > 3x** current buy factor
  - 3 × $300 mil = $900 million
  - Sell if there are suitable replacements
- **Adjusted EPS 12m Negative**
  - Not GAAP earnings
  - Stock placed on probation when quarterly results push trailing EPS negative
  - If subsequent quarter has negative EPS while trailing EPS still negative, stock is sold
    - If subsequent quarterly EPS is positive but trailing EPS is negative, stock remains on probation
  - Sell even if no suitable replacements
- **Sell holdings older than four years**, unless up more than 40% since purchase (~10% annual gain) and not currently passing
  - Sell if there are suitable replacements

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Shadow Stock Portfolio Management Rules

- If proceeds from stocks sold are greater than required to buy average position of all qualified stocks:
  - Invest average portfolio position in qualified stocks
  - Keep up to 5% of portfolio in cash
  - Distribute excess of 5% among underweighted positions that still qualify as buys
  - If over 10% of the portfolio is in cash, the price-to-book-value ratio can be raised

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Shadow Stock Portfolio Management Rules

- Decisions are made at the end of the quarter once the earnings results have been announced
  - Typically, in early March, June, September & December
- Use best judgment for mergers/tenders, but still follow rules

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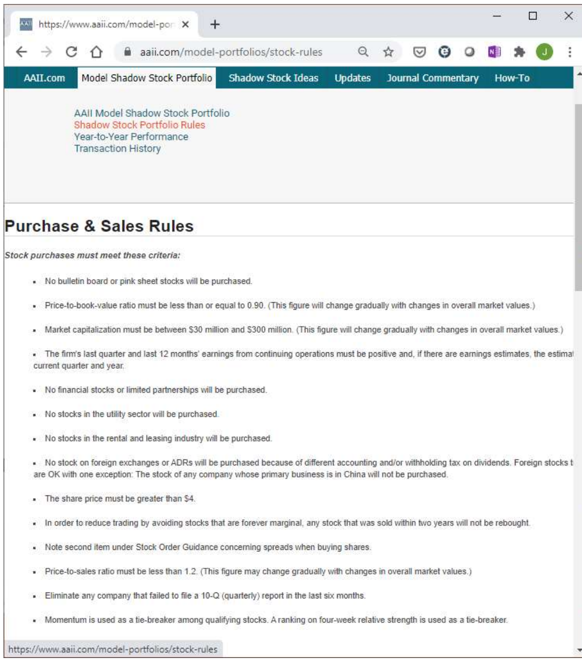

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AAII Model Shadow Stock Portfolio
Shadow Stock Portfolio Rules
Year-to-Year Performance
Transaction History

Purchase & Sales Rules

Stock purchases must meet these criteria:

- No bulletin board or pink sheet stocks will be purchased.
- Price-to-book-value ratio must be less than or equal to 0.90. (This figure will change gradually with changes in overall market values.)
- Market capitalization must be between $30 million and $300 million. (This figure will change gradually with changes in overall market values.)
- The firm's last quarter and last 12 months' earnings from continuing operations must be positive and, if there are earnings estimates, the estimal current quarter and year.
- No financial stocks or limited partnerships will be purchased.
- No stocks in the utility sector will be purchased.
- No stocks in the rental and leasing industry will be purchased.
- No stock on foreign exchanges or ADRs will be purchased because of different accounting and/or withholding tax on dividends. Foreign stocks t are OK with one exception: The stock of any company whose primary business is in China will not be purchased.
- The share price must be greater than $4.
- In order to reduce trading by avoiding stocks that are forever marginal, any stock that was sold within two years will not be rebought.
- Note second item under Stock Order Guidance concerning spreads when buying shares.
- Price-to-sales ratio must be less than 1.2. (This figure may change gradually with changes in overall market values.)
- Eliminate any company that failed to file a 10-Q (quarterly) report in the last six months.
- Momentum is used as a tie-breaker among qualifying stocks. A ranking on four-week relative strength is used as a tie-breaker.

https://www.aaii.com/model-portfolios/stock-rules

- Current Model Shadow Stock Portfolio rules can always be found in this section
- Rules are divided into sections dealing with initial buy criteria, sell criteria, guidelines for placing orders, and overall portfolio management rules

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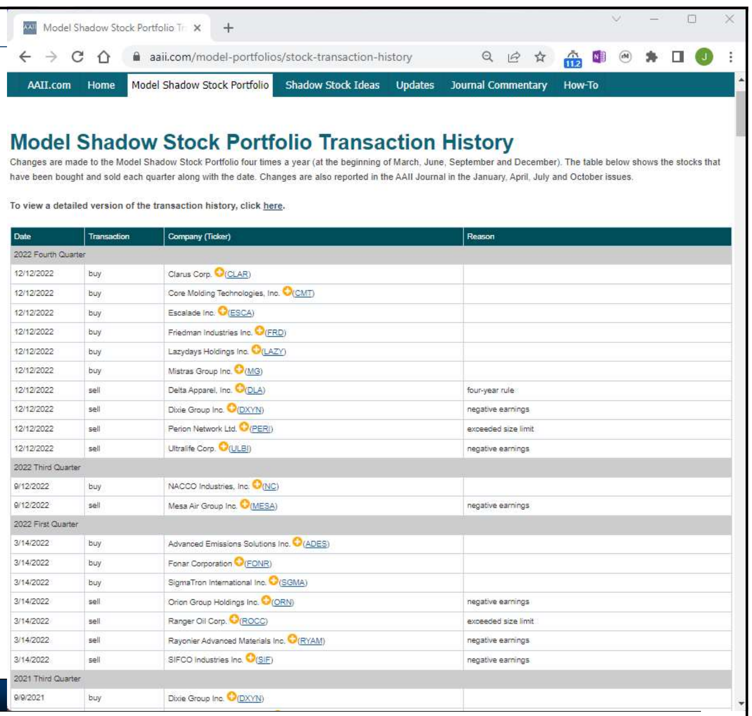

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Model Shadow Stock Portfolio Transaction History

Changes are made to the Model Shadow Stock Portfolio four times a year (at the beginning of March, June, September and December). The table below shows the stocks that have been bought and sold each quarter along with the date. Changes are also reported in the AAII Journal in the January, April, July and October issues.

To view a detailed version of the transaction history, click here.

Date	Transaction	Company (Ticker)	Reason
2022 Fourth Quarter			
12/12/2022	buy	Clarus Corp. (CLAR)	
12/12/2022	buy	Core Molding Technologies, Inc. (CMT)	
12/12/2022	buy	Escalade Inc. (ESCA)	
12/12/2022	buy	Friedman Industries Inc. (FRD)	
12/12/2022	buy	Lazydays Holdings Inc. (LAZY)	
12/12/2022	buy	Mistras Group Inc. (MG)	
12/12/2022	sell	Delta Apparel, Inc. (DLA)	four-year rule
12/12/2022	sell	Dixie Group Inc. (DXYN)	negative earnings
12/12/2022	sell	Perion Network Ltd. (PERI)	exceeded size limit
12/12/2022	sell	Ultralife Corp. (ULBI)	negative earnings
2022 Third Quarter			
9/12/2022	buy	NACCO Industries, Inc. (NC)	
9/12/2022	sell	Mesa Air Group Inc. (MESA)	negative earnings
2022 First Quarter			
3/14/2022	buy	Advanced Emissions Solutions Inc. (ADES)	
3/14/2022	buy	Fonar Corporation (FONR)	
3/14/2022	buy	SigmaTron International Inc. (SGMA)	
3/14/2022	sell	Orion Group Holdings Inc. (ORN)	negative earnings
3/14/2022	sell	Ranger Oil Corp. (ROCC)	exceeded size limit
3/14/2022	sell	Rayonier Advanced Materials Inc. (RYAM)	negative earnings
3/14/2022	sell	SIFCO Industries Inc. (SIF)	negative earnings
2021 Third Quarter			
9/9/2021	buy	Dixie Group Inc. (DXYN)	

- Transaction History page lists the Model Shadow Stock Portfolio transactions dating back to 2003

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Model Shadow Stock Portfolio Turnover Statistics

	Avg Holding Period (Yrs)	Annual Portfolio Turnover	Average Buys/Sells per Year	Average No of Holdings	Ann'l Return
Inception	**4.0**	**25%**	**10**	**30**	**13.5%**
2022	3.0	33%	10	30	(19.7%)
2021	8.0	13%	20	29	35.3%
2020	5.9	17%	6	29	13.8%
2019	4.2	24%	8	28	19.6%
2018	11.7	9%	4	29	(24.4%)
2017	3.4	30%	9	31	14.0%
2016	6.5	15%	5	31	29.8%
2015	5.1	19%	8	31	(15.2%)
2014	10.4	10%	4	31	(5.8%)
2013	4.3	23%	8	30	61.0%
2012	5.6	18%	7	29	33.3%
2011	5.3	19%	8	27	6.3%
2010	2.9	35%	12	28	45.4%
2009	3.6	27%	11	26	72.3%
2008	3.4	29%	10	29	(50.8%)
2007	1.8	57%	26	30	(1.8%)
2006	3.2	31%	13	33	29.4%
2005	2.9	34%	13	35	17.9%
2004	3.2	31%	13	36	43.7%

Data as of 12/31/2022

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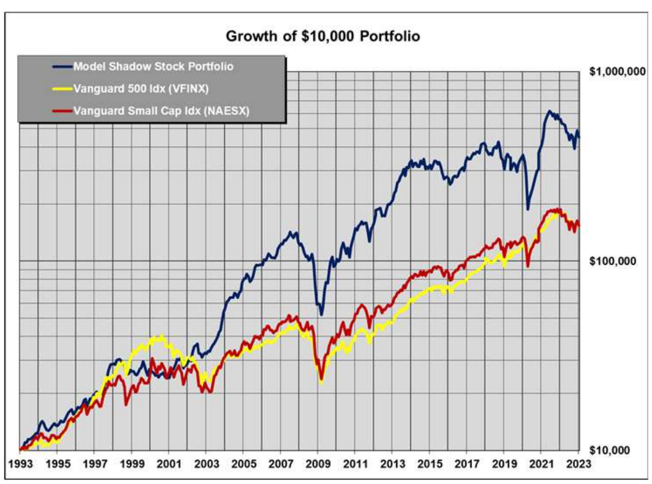
Portfolio	Monthly Return (%)	YTD Return (%)	Annual Return (%) 1-Year	3-Year	5-Year	10-Year	20-Year	Since Inception	Last 3 Years Ann'l Ret (%)	Risk-Adj Ret	Ann'l Std Dev (%)	Since Inception Ann'l Ret (%)	Risk-Adj Ret (%)	Ann'l Std Dev (%)
Model Shadow Stock Portfolio	**(7.8)**	**(19.7)**	**(19.7)**	**7.3**	**2.3**	**7.8**	**14.0**	**13.5**	**7.3**	**7.3**	**35.7**	**13.5**	**11.6**	**21.8**
Vanguard 500 Index (VFINX)	(5.8)	(18.2)	(18.2)	7.5	9.3	12.4	9.7	9.5	7.5	7.5	19.9	9.5	9.5	15.0
Vanguard Small Cap Index (NAESX)	(6.0)	(17.7)	(17.7)	4.8	5.6	9.8	10.3	9.5	4.8	3.2	33.0	9.5	9.1	19.0
Dimensional U.S. Micro Cap (DFSCX)	(5.7)	(12.5)	(12.5)	7.6	5.8	10.3	10.4	10.8	7.6	7.6	22.2	10.8	9.8	20.4

Data as of 12/31/2022.



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Security Performance 12/31/2021 - 12/31/2022

Security	Ticker	Starting Value	Ending Value	Profit (%)	Return On Investmen (%)	Sector	Industry
Pangaea Logistics Solutions	PANL	$4,574	$6,232	44.2%	45.4%	Industrials	Freight & Logistics - Marine
Covenant Logistics Group	CVLG	$5,603	$7,329	31.9%	32.0%	Industrials	Freight & Logistics - Ground
Ranger Oil	ROCC	$3,580	$0	27.3%	27.3%	Energy	Oil & Gas - Exploration and Production
Core Molding Technologies	CMT	$0	$6,495	23.1%	<30 Days	Basic Materials	Non-Paper Containers & Packaging
Ennis Business Forms Inc.	EBF	$2,734	$3,102	18.6%	19.1%	Industrials	Commercial Printing Services
Titan Machinery	TITN	$9,164	$10,807	17.9%	17.9%	Industrials	Heavy Machinery & Vehicles
Bassett Furniture Ind. (Furn	BSET	$5,735	$5,944	16.2%	17.6%	Consumer Cyclicals	Home Furnishings
Friedman Industries	FRD	$0	$6,080	13.6%	<30 Days	Basic Materials	Metals & Mining - Iron & Steel
Mistras Group	MG	$0	$5,916	12.2%	<30 Days	Energy	Oil & Gas - Integrated
Rayonier Advanced Material	RYAM	$5,579	$0	9.1%	9.1%	Basic Materials	Chemicals - Specialty
SIFCO Industries	SIF	$6,500	$0	7.7%	7.7%	Basic Materials	Metals & Mining - Iron & Steel
Ducommun	DCO	$6,969	$7,444	6.8%	6.8%	Industrials	Aerospace & Defense
Perion Network Ltd	PERI	$22,126	$0	5.6%	5.6%	Technology	Software
Vishay Precision Grp	VPG	$12,250	$12,755	4.1%	4.1%	Industrials	Industrial Machinery & Equipment
Kimball Electronics Inc	KE	$4,047	$4,202	3.8%	3.8%	Technology	Semiconductors
Escalade, Inc.	ESCA	$0	$5,436	2.6%	<30 Days	Consumer Cyclicals	Recreational Products
Clarus Corp	CLAR	$0	$5,096	-3.7%	<30 Days	Consumer Cyclicals	Recreational Products
Fonar Corp.	FONR	$0	$5,762	-3.8%	-3.8%	Healthcare	Advanced Medical Equipment & Technology
Hurco Companies, Inc.	HURC	$3,059	$2,691	-10.0%	-10.2%	Industrials	Industrial Machinery & Equipment
Lazydays Holdings	LAZY	$0	$4,525	-14.6%	<30 Days	Consumer Cyclicals	Recreational Products
Hooker Furniture Corporatio	HOFT	$3,376	$2,712	-16.2%	-16.4%	Consumer Cyclicals	Home Furnishings
VOXX International	VOXX	$6,611	$5,447	-17.6%	-17.6%	Technology	Household Electronics
NACCO Industries, Inc.	NC	$0	$4,370	-19.3%	-19.3%	Energy	Coal
Global Ship Lease Inc	GSL	$6,484	$4,712	-21.3%	-21.9%	Industrials	Freight & Logistics - Marine
VSE Corporation	VSEC	$8,410	$6,469	-22.4%	-22.5%	Industrials	Aerospace & Defense
Ultralife Ultralife Corp	ULBI	$7,731	$0	-28.6%	-28.7%	Industrials	Electrical Components & Equipment
Key Tronic Corporation	KTCC	$2,798	$1,936	-30.8%	-30.8%	Technology	Computer Hardware
Orion Group Holdings	ORN	$2,262	$0	-37.9%	-37.9%	Industrials	Construction & Engineering
Rocky Brands Inc	RCKY	$5,890	$3,496	-39.1%	-39.4%	Consumer Cyclicals	Footwear
Strattec Security Corp.	STRT	$6,108	$3,391	-44.5%	-44.5%	Consumer Cyclicals	Auto, Truck & Motorcycle Parts
Beazer Homes	BZH	$7,686	$4,224	-45.1%	-45.1%	Consumer Cyclicals	Homebuilding
Big 5 Sporting Goods Corp	BGFV	$12,889	$5,987	-48.3%	-49.5%	Consumer Cyclicals	Retailers - Miscellaneous Specialty
Ampco-Pittsburgh Corp	AP	$2,670	$1,340	-49.8%	-49.8%	Basic Materials	Metals & Mining - Iron & Steel
SigmaTron International	SGMA	$0	$2,611	-56.4%	-56.4%	Technology	Semiconductors
Container Store Group Inc.	TCS	$7,385	$3,189	-56.8%	-56.8%	Consumer Cyclicals	Retailers - Miscellaneous Specialty
Mesa Air Group, Inc. (Transp	MESA	$2,520	$0	-57.1%	-57.1%	Industrials	Airlines
Adv Emissions Solutions	ADES	$0	$2,517	-57.9%	-57.9%	Industrials	Environmental Services & Equipment
Delta Apparel, Inc.	DLA	$7,851	$0	-62.3%	-62.3%	Consumer Cyclicals	Apparel & Accessories
Dixie Group, Inc.	DXYN	$8,710	$0	-81.5%	-81.5%	Consumer Cyclicals	Home Furnishings

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Total Returns

S&P Indexes	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
S&P 500	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	(4.4%)	31.5%	18.4%	28.7%	(18.1%)
S&P 500 Growth	14.6%	32.8%	14.9%	5.5%	6.9%	27.4%	(0.0%)	31.1%	33.5%	32.0%	(29.4%)
S&P 500 Value	17.7%	32.0%	12.4%	(3.1%)	17.4%	15.4%	(9.0%)	31.9%	1.4%	24.9%	(5.2%)
S&P MidCap 400	17.9%	33.5%	9.8%	(2.2%)	20.7%	16.2%	(11.1%)	26.2%	13.7%	24.8%	(13.1%)
S&P MidCap 400 Growth	17.3%	32.8%	7.6%	2.0%	14.8%	19.9%	(10.3%)	26.3%	22.8%	18.9%	(19.0%)
S&P MidCap 400 Value	18.5%	34.3%	12.1%	(6.7%)	26.5%	12.3%	(11.9%)	26.1%	3.7%	30.7%	(6.9%)
S&P SmallCap 600	16.3%	41.3%	5.8%	(2.0%)	26.6%	13.2%	(8.5%)	22.8%	11.3%	26.8%	(16.1%)
S&P SmallCap 600 Growth	14.6%	42.7%	3.9%	2.8%	22.2%	14.8%	(4.1%)	21.1%	19.6%	22.6%	(21.1%)
S&P SmallCap 600 Value	18.2%	40.0%	7.5%	(6.7%)	31.3%	11.5%	(12.6%)	24.5%	2.5%	31.0%	(11.0%)

Annual Returns

S&P Indexes	3 Yr	5 Yr	10 Yr
S&P 500	7.7%	9.4%	12.6%
S&P 500 Growth	7.5%	10.3%	13.6%
S&P 500 Value	6.3%	7.6%	10.9%
S&P MidCap 400	7.2%	6.7%	10.8%
S&P MidCap 400 Growth	5.8%	6.0%	10.4%
S&P MidCap 400 Value	8.1%	7.0%	10.8%
S&P SmallCap 600	5.8%	5.9%	10.8%
S&P SmallCap 600 Growth	5.0%	6.1%	11.1%
S&P SmallCap 600 Value	6.1%	5.4%	10.3%

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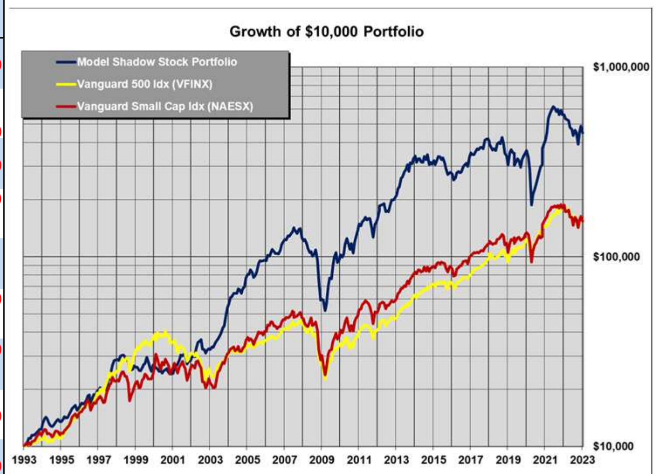
Year	Model Shadow Stock Portfolio	Vanguard 500 Index (VFINX)	Vanguard Small Cap Index (NAESX)
1993	32.3	9.9	18.7
1994	2.0	1.2	(0.5)
1995	20.7	37.4	28.7
1996	22.3	22.9	18.1
1997	44.3	33.2	24.6
1998	(8.9)	28.6	(2.6)
1999	(0.0)	21.1	23.1
2000	(7.7)	(9.1)	(2.7)
2001	21.4	(12.0)	3.1
2002	10.8	(22.1)	(20.0)
2003	73.1	28.5	45.6
2004	43.7	10.8	19.9
2005	17.9	4.8	7.4
2006	29.4	15.6	15.6
2007	(1.8)	5.4	1.2
2008	(50.8)	(37.0)	(36.0)
2009	72.3	26.5	36.1
2010	45.4	14.9	27.7
2011	6.3	2.0	(2.8)
2012	33.3	15.8	18.0
2013	61.0	32.2	37.6
2014	(5.8)	13.5	7.4
2015	(15.2)	1.3	(3.8)
2016	29.8	11.8	18.2
2017	14.0	21.7	16.1
2018	(24.4)	(4.5)	(10.5)
2019	19.6	31.3	27.2
2020	13.8	18.3	19.0
2021	35.3	28.6	17.6
YTD*	(19.7)	(18.2)	(17.7)
Inception	**13.5**	**9.5**	**9.5**

**Through Dec 31, 2022.*



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Time Frame and Performance

(Rolling Periods 1993 - 2022)

Holding Period	Percentage of Holding Periods That Resulted in Better Performance: Model Shadow Stock Outperformed	S&P 500 Outperformed
1 Month	53% (189)	48% (171)
1 Year	55% (191)	45% (158)
3 Year	51% (165)	49% (160)
5 Year	64% (192)	36% (109)
10 Year	85% (205)	15% (36)
15 Year	90% (163)	10% (18)
20 Year	100% (121)	0% (0)

Past performance is no guarantee of future results.

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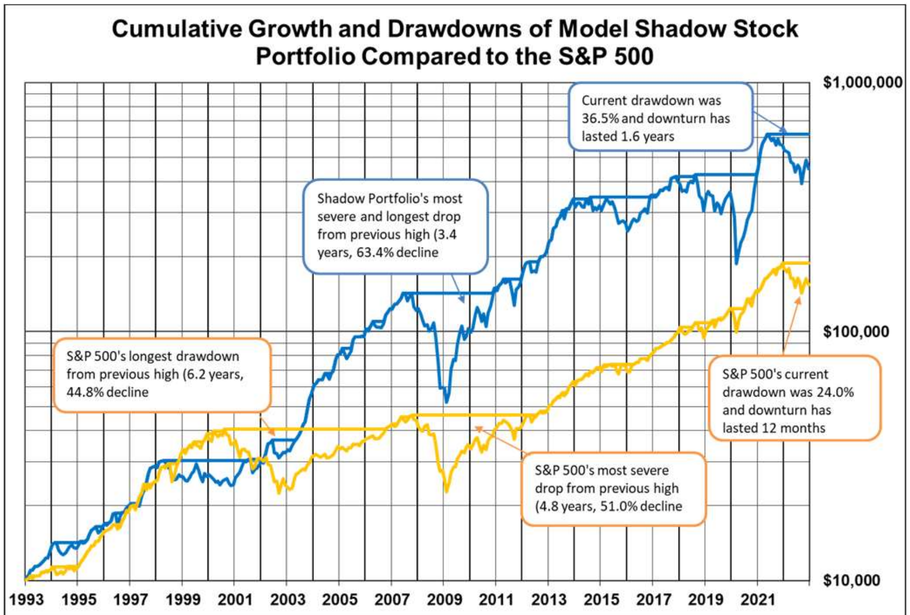

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Corrections Over Existence of Model Shadow Stock Portfolio
(computed with monthly total returns)

Corrections (10% or greater decline)	Model Shadow Stock Portfolio	Vanguard 500 Index (VFINX)
Number Observed	12	6
Average Length	1.4 years	2.2 years
Shortest Duration	2 months	4 months
Longest Duration	3.4 years	6.2 years
Average Drawdown	(26.1%)	(28.1%)
Largest Drawdown	(63.4%)	(51.0%)
Bear Markets (20% or greater decline)		
Number Observed	6	4
Average Length	2.2 years	3.1 years
Shortest Duration	8 months	6 months
Longest Duration	3.4 years	6.2 years
Average Drawdown	(37.4%)	(34.8%)
Largest Drawdown	(63.4%)	(51.0%)
Returns Since Inception		
Total Return	4,402.8%	1,401.8%
Annualized Return	13.5%	9.5%
Monthly Holding Periods with Losses	39% (139 out of 360)	34% (123 out of 360)
1-Year Holding Periods with Losses	28% (97 out of 349)	19% (66 out of 349)
5-Year Holding Periods with Losses	5% (16 out of 301)	16% (49 out of 301)
10-Year Holding Periods with Losses	0% (0 out of 241)	10% (24 out of 241)
15-Year Holding Periods with Losses	0% (0 out of 181)	0% (0 out of 181)

Figures calculated from monthly total returns. Data as of 12/31/2022.
Past performance is no guarantee of future results.

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Time Frame, Losses & Return Extremes

(Rolling Periods 1993 - 2022)

Holding Period (Years)	Model Shadow Stock Portfolio: % of Periods Resulting in Losses	Highest Annual Return	Lowest Annual Return	Vanguard 500 Index (VFINX): % of Periods Resulting in Losses	Highest Annual Return	Lowest Annual Return
1	28%	203.5%	(55.6%)	19%	56.2%	(43.3%)
3	15%	52.8%	(19.7%)	18%	32.7%	(16.1%)
5	5%	44.5%	(11.1%)	16%	28.5%	(6.7%)
10	0%	22.7%	4.9%	10%	16.5%	(3.5%)
15	0%	19.1%	5.6%	0%	10.8%	3.6%
20	0%	17.8%	10.5%	0%	9.9%	4.7%

Past performance is no guarantee of future results.

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Annual Total Return Performance

	Model Shadow Stock Portfolio				Vanguard 500 Index (VFINX)			
Year	Always Invested (%)	Skip Best & Worst Month (%)	Skip Best Month (%)	Skip Worst Month (%)	Always Invested (%)	Skip Best & Worst Month (%)	Skip Best Month (%)	Skip Worst Month (%)
1993	32.3	23.3	23.3	32.4	9.9	8.5	5.9	12.6
1994	2.0	2.5	(3.2)	8.0	1.2	1.7	(2.8)	5.8
1995	20.7	22.7	15.6	28.1	37.4	32.2	31.7	37.9
1996	22.3	26.2	11.8	38.2	22.9	19.5	14.2	28.5
1997	44.3	33.6	30.1	48.2	33.2	30.7	23.4	41.1
1998	(8.9)	(4.7)	(13.8)	0.7	28.6	39.0	18.9	50.4
1999	(0.0)	0.3	(7.5)	8.4	21.1	17.5	13.9	25.0
2000	(7.7)	(7.2)	(11.0)	(3.8)	(9.1)	(10.1)	(17.1)	(1.3)
2001	21.4	26.3	13.2	35.4	(12.0)	(10.2)	(18.4)	(3.2)
2002	10.8	12.0	(0.0)	24.2	(22.1)	(19.7)	(28.4)	(12.6)
2003	73.1	53.3	51.7	75.0	28.5	21.9	18.7	32.0
2004	43.7	34.6	28.9	50.1	10.8	10.1	6.5	14.6
2005	17.9	12.6	6.5	24.7	4.8	3.5	1.0	7.4
2006	29.4	23.9	20.0	33.6	15.6	15.3	12.0	19.1
2007	(1.8)	4.8	(6.5)	10.1	5.4	5.3	0.9	10.0
2008	(50.8)	(40.4)	(53.3)	(37.2)	(37.0)	(27.8)	(39.9)	(24.3)
2009	72.3	56.8	37.9	95.9	26.5	29.2	15.5	41.6
2010	45.4	44.3	27.9	64.0	14.9	14.7	5.5	24.9
2011	6.3	2.7	(8.6)	19.4	2.0	(1.1)	(8.1)	9.7
2012	33.3	32.8	20.8	46.6	15.8	18.0	10.9	23.2
2013	61.0	45.3	45.3	61.0	32.2	29.4	25.7	36.2
2014	(5.8)	(0.8)	(12.2)	6.6	13.5	12.4	8.5	17.6
2015	(15.2)	(13.8)	(19.7)	(9.0)	1.3	(0.6)	(6.6)	7.8
2016	29.8	24.2	15.7	39.3	11.8	10.2	4.7	17.7
2017	14.0	6.8	2.7	18.6	21.7	16.9	17.0	21.5
2018	(24.4)	(20.7)	(30.0)	(14.3)	(4.5)	(0.7)	(9.7)	5.0
2019	19.6	19.6	3.2	38.5	31.3	29.9	21.6	40.3
2020	13.8	43.8	(6.7)	75.2	18.3	19.6	4.8	35.0
2021	35.3	22.0	14.5	44.1	28.6	26.0	20.2	34.9
2022	(19.7)	(19.3)	(30.0)	(7.4)	(18.2)	(17.5)	(25.1)	(9.9)
CAGR**	**13.5**	**13.1**	**2.7**	**25.0**	**9.6**	**9.8**	**17.1**	**2.8**

**Through Dec 31, 2022.*

***CAGR: compound Annual Growth Rate*

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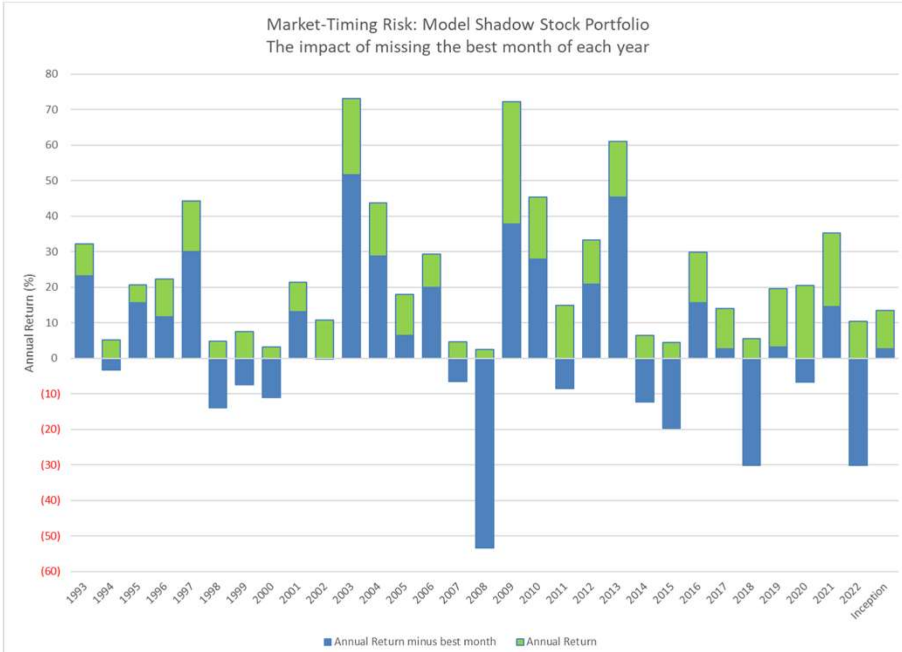

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Total Return

S&P Select Sectors	2019	2020	2021	2022
Energy	11.8%	(33.7%)	53.4%	64.6%
Utilities	26.4%	0.5%	17.7%	1.6%
Consumer Staples	27.6%	10.8%	17.3%	(0.7%)
Health Care	20.9%	13.5%	26.1%	(2.0%)
Industrials	29.3%	11.1%	21.1%	(5.5%)
Financials	32.1%	(1.8%)	35.0%	(10.5%)
Materials	24.6%	20.7%	27.3%	(12.3%)
Real Estate	29.0%	(2.2%)	46.2%	(26.1%)
Technology	50.3%	43.9%	34.7%	(27.6%)
Consumer Discretionary	27.9%	33.3%	28.0%	(36.2%)
Communication Services	32.7%	23.6%	16.0%	(37.7%)
S&P 500	**31.5%**	**18.4%**	**28.7%**	**(18.1%)**

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Valuation & Performance Snapshot of Market Segments and Sectors

Ranked by 52-Week Price Change

Median Values	52-Wk Price Change (%)	P/Book Ratio (X)	P/Sales Ratio (X)	P/E Ratio (X)	EPS Growth Rate 3 Yr (%)	EPS Growth Rate 12 m (%)	Profit Margin (%)	Avg Qrtrly Earnings Surprise (%)	Avg Current Year Est Revision (% 4 wk)	Market Cap ($ Mil)
S&P MidCap 400	(13.8)	2.55	1.86	17.4	12.3	11.1	9.6	6.6	(0.7)	5,166
S&P 500	(14.2)	3.25	2.71	21.6	12.9	6.7	13.0	6.2	(3.9)	29,671
S&P SmallCap 600	(18.1)	1.67	1.35	14.7	11.4	7.0	6.3	7.6	(0.8)	1,358
Shadow Stock Portfolio	(18.8)	0.76	0.37	10.3	33.5	32.0	5.2	(19.6)	(1.4)	199
SI Pro Sector Medians										
Energy	26.9	1.66	1.25	8.8	3.1	81.7	6.9	(7.9)	(1.7)	1,413
Financials	0.0	1.30	2.89	14.3	14.6	(4.2)	27.0	6.2	0.0	357
Utilities	(5.1)	1.89	2.39	20.6	3.4	6.1	10.5	10.9	(0.8)	4,831
Academic & Educational Servs	(10.3)	1.05	1.02	19.7	(0.8)	33.3	0.7	71.9	(6.0)	184
Basic Materials	(16.5)	1.49	0.94	11.4	15.1	13.3	6.9	(22.1)	2.4	1,123
Consumer Non-Cyclicals	(16.7)	2.05	1.07	20.4	8.9	(1.0)	2.5	(9.1)	(2.3)	1,401
Industrials	(21.4)	2.04	1.23	19.3	8.0	18.5	4.8	0.6	(3.1)	939
Real Estate	(30.5)	1.12	3.73	21.0	5.7	19.4	10.7	24.8	(1.0)	1,300
Consumer Cyclicals	(37.3)	1.72	0.73	12.8	13.8	3.6	3.4	1.3	(5.4)	884
Technology	(46.4)	2.10	2.00	20.7	7.4	(1.0)	(4.1)	9.5	(1.1)	774
Health Care	(56.4)	1.69	4.03	23.7	5.2	(4.8)	(35.9)	(4.6)	(0.7)	163

Median values of index and sector constituents for price changes, valuation, profitability and market cap. Averages for earnings surprise and estimate revisions.

Source: AAII Stock Investor Pro/Refinitiv. Data as of 12/31/2022.

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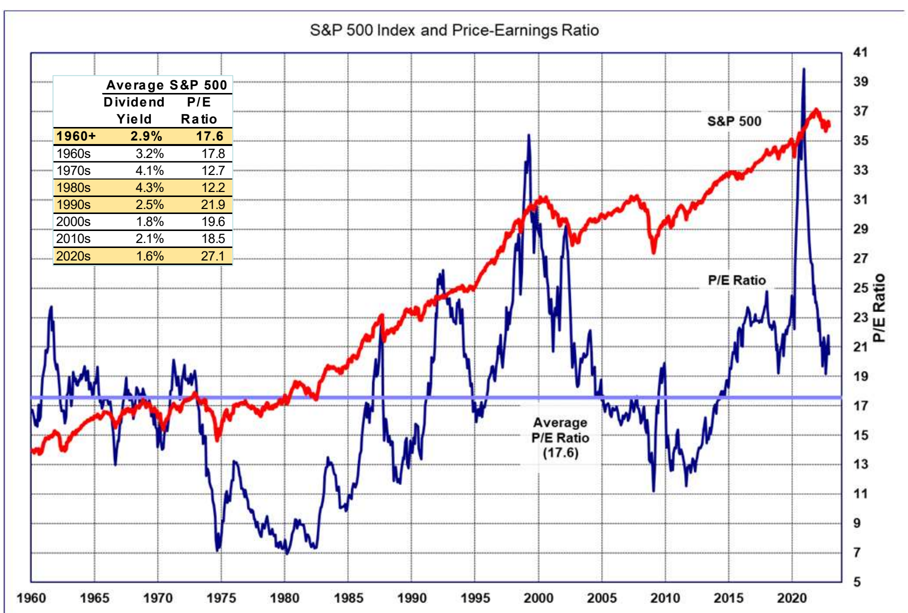

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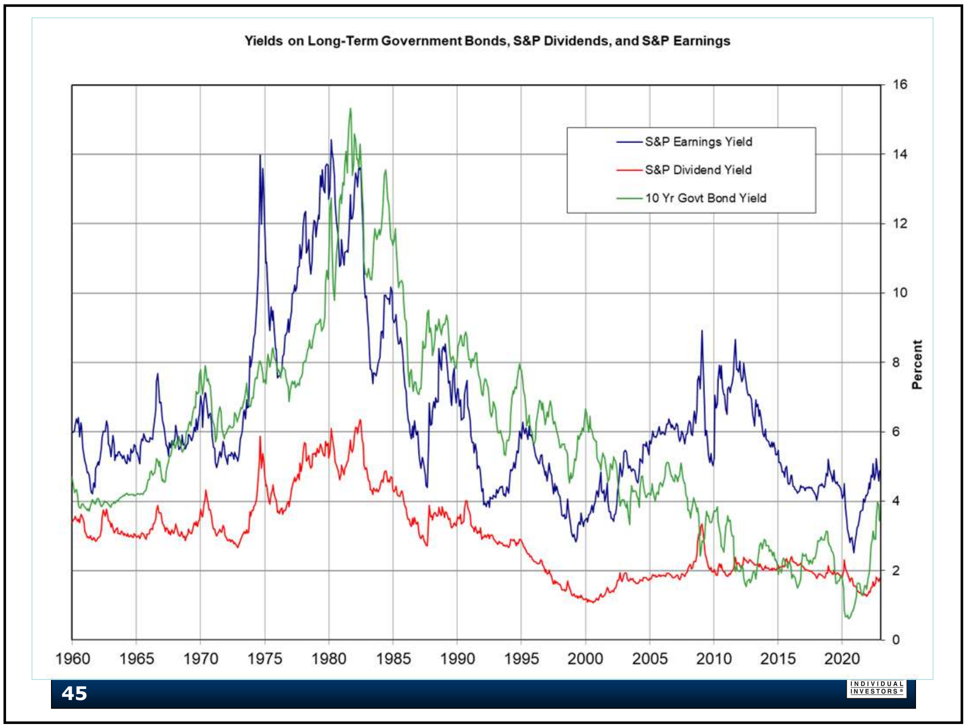
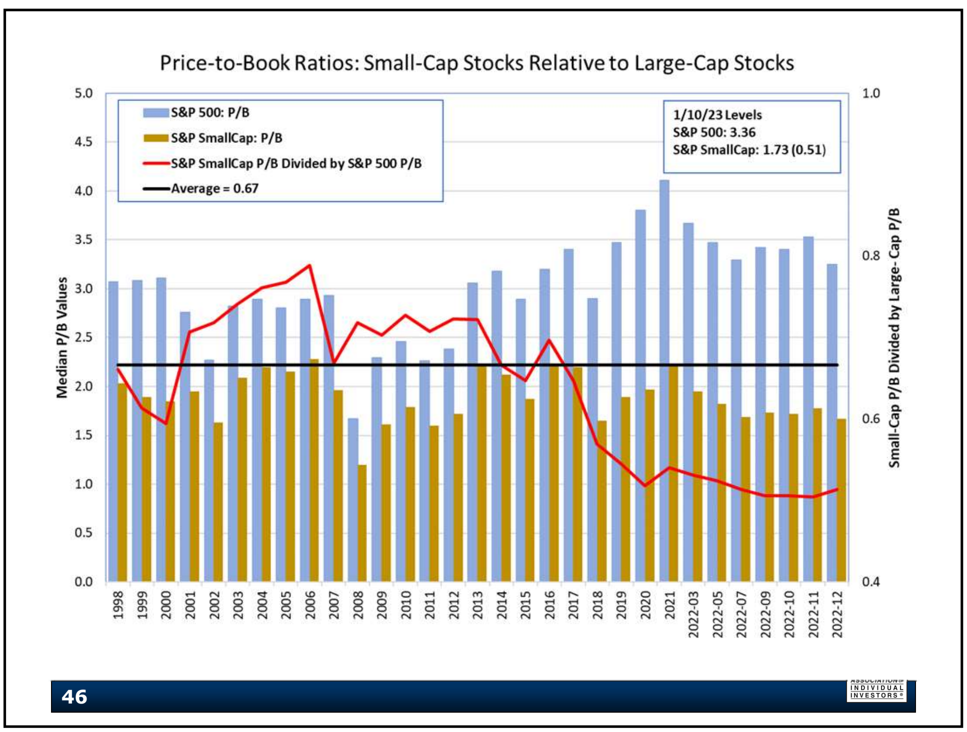


Yields on Long-Term Government Bonds, S&P Dividends, and S&P Earnings
S&P Earnings Yield
S&P Dividend Yield
10 Yr Govt Bond Yield
Percent
16
14
12
10
8
6
4
2
0
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
45

45



Price-to-Book Ratios: Small-Cap Stocks Relative to Large-Cap Stocks
S&P 500: P/B
S&P SmallCap: P/B
S&P SmallCap P/B Divided by S&P 500 P/B
Average = 0.67
1/10/23 Levels
S&P 500: 3.36
S&P SmallCap: 1.73 (0.51)
Median P/B Values
Small-Cap P/B Divided by Large-Cap P/B
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.0
0.8
0.6
0.4
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022-03
2022-05
2022-07
2022-09
2022-10
2022-11
2022-12
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Model Portfolio Sector Holdings

Stock Investor Sectors	Model Portfolio Holdings #	Model Portfolio Holdings % of Value
Academic & Educational Services	0	0.0%
Basic Materials	3	8.9%
Consumer Cyclicals	10	29.2%
Consumer Non-Cyclicals	0	0.0%
Energy	2	6.3%
Financials	0	0.0%
Healthcare	1	3.8%
Industrials	10	40.8%
Real Estate	0	0.0%
Technology	4	9.3%
Utilities	0	0.0%

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Keep a Long-Term Perspective

- Micro-cap stocks tend to have consecutive periods of overperformance and then underperformance
- Micro-cap stocks have more volatility than large-cap stocks; important to maintain diversified portfolio and consider all asset classes and foreign markets as well as domestic markets

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Keep a Long-Term Perspective

- Maintain reasonable expectations
- Market is reasonably efficient, but not in the academic sense that all information is instantaneously reflected in prices of all stocks. Nevertheless, information will eventually lead to stock price adjustments
  - Adjustments quicker for large caps than micro caps

Keys to Long-Term Success

- To succeed with the Shadow Stock approach:
  - Need enough time to manage a stock portfolio
    - Approach designed so that it only needs a careful examination quarterly, perhaps an 8-hour commitment
    - If one has time, the portfolio can be reviewed monthly to keep up to date on earnings and company news
  - Need an interest in managing a portfolio—in good times and bad
  - Need discipline to follow the program once you have committed to it
  - Important to control turnover with micro-cap stocks

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