

AAII STOCK IDEAS

Mighty Minis: Tiny Titans Stand Tall in 2018

Nearly duplicating last year's turnaround, this year's top-performing AAI screening strategy ranked near the bottom in 2017.

BY WAYNE A. THORP, CFA

U.S. stocks had a tough act to follow in 2018 after 2017's banner year. However, in the face of the Tax Cuts and Jobs Act (TCJA) that President Trump signed into law at the end of 2017, along with a growing U.S. economy and strong corporate earnings, there were reasons for optimism. As we come to the end of 2018, though, many investors probably feel let down by the U.S. stock market this year. Contributing to the underwhelming performance in U.S. stocks were the bubbling trade dispute between the U.S. and China, rising inflation, weakening energy and housing markets, a flattening yield curve and political uncertainty and strife here at home and in Europe.

Year to date through the end of November 2018, the S&P 500 index has endured two corrections—price declines of more than 10% but less than 20%. However, the S&P 500 was still up more than 3% on a price-change basis for the year through the end of November and stood less than 6% below its all-time high close set on September 20, 2018. The Dow Jones industrial average (DJIA) has added 3.3% for the year and the Nasdaq composite is up 6.2% through the close on November 30.

The market declines also didn't keep the stock market from entering record territory this year. On August 22, 2018, the S&P 500 marked its 3,453rd day without seeing a 20% decline, making this the longest bull market in U.S. history, by most accounts.

If you prescribe to the Presidential Election Cycle theory, 2018 has actually outperformed relative to historical results. Since 1896 when the DJIA was created, it has produced an average fiscal-year (November 1 through October 31) gain of 4.1% during second years in presidential cycles

according to The Wall Street Journal. Between the close on October 31, 2017, and October 31, 2018, the Dow gained 7.4% on a price-change basis.

2018 Investment Thesis: Volatility & Narrow Market Participation

After record-low volatility in 2017, 2018 saw a reversion to the mean. The CBOE Volatility Index (the VIX)—the market's collective "fear gauge"—hit an all-time low in November 2017 and was down nearly 20% in 2017. Looking at the 200-day moving average for the VIX in 2017, it was an almost perfectly straight downward sloping line. That came to an end almost as soon as the ball dropped to start 2018, and in a little over a month the VIX had jumped nearly 240% from 2017's close. For the year, through the close on November 30, 2018, the VIX was up more than 63%.

Furthermore, 2017 did not see a single trading day where the S&P 500 was down 2% or more. Through the close on December 7, 2018, there have been 11 days this year with losses of at least 2% in the large-cap index.

During 2017, the largest intraday spread for the S&P 500—the percentage difference between the daily high and low values for the index—was 1.7%, set on December 1. For 2018 as of the close on December 7, the largest intraday spread for the S&P 500 was 4.7%, set back on February 5. That day the index fell 4.1%. In all, there have been five trading days in 2018 where the intraday spread for the S&P 500 was 4.0% or more (the average percentage change in the index on those days was a decline of 1.1%) and 40 trading days with an intraday spread that exceeded 2017's largest daily spread.

In addition to the spike in market volatility, the average stock has not enjoyed the same success as the major U.S. stock indexes. Market participation in 2018 has not been broad-based. In fact, of the 6,180 U.S.-listed stocks tracked by AAI's *Stock Investor Pro* fundamental stock screening and research database program, 4,017 (65.0%) are down more than 20% from their 52-week high year to date.

Drilling deeper into the data provides a clearer picture of the pockets of strength and weakness among U.S. stocks for 2018. Table 1 reports data on the number of stocks that are trading at least 20% below their 52-week high as of November 30, 2018. The data is broken down by index, exchange and sector [as designated by Thomson Reuters Business Classification (TRBC)].

Table 1 confirms that 2018 tended to favor larger companies in less economic-sensitive sectors. Among stocks that trade over-the-counter (OTC), more than three-quarters (77.8%) were trading at least 20% below their 52-week high at the end of November. OTC stocks tend to be very small companies—the median market capitalization (stock price multiplied by shares outstanding) for all OTC stocks in AAI's *Stock Investor Pro* database as of November 30 was



Wayne A. Thorp, CFA, is the senior financial analyst and a vice president at AAI. Follow him on Twitter at @WayneTAAII. Find out more at www.aaii.com/authors/wayne-thorp.

only \$14.4 million. For comparison, stocks that are part of the New York Stock Exchange had a median market cap of \$2.76 billion at the end of November and slightly more than half (53.6%) were down 20% or more from their 52-week high.

Only 35.3% of the S&P 500 companies in the *Stock Investor Pro* database were down 20% or more from their 52-week high at the end of November. Meanwhile, 55.3% of the companies in the S&P SmallCap 600 index were down 20% or more from their 52-week high.

Lastly, looking at sectors, those that are more closely tied to the economy have seen their stock prices suffer. For the stocks that make up the basic materials sector, nearly 80% are trading 20% or more below their 52-week high. More than three-quarters of the companies in the energy (78.9%) and healthcare (77.2%) sectors are also down at least 20% from their 52-week high.

On the opposite end of the spectrum, only 21.5% of companies in the utilities sector are down 20% or more from their 52-week high as of the end of November, while 40.6% of firms in the financials sector are down at least 20% from their 52-week high.

2018 Performance of AAIL Stock Strategies

AAIL has been developing, testing, refining and tracking a variety of quantitative stock strategies for 20 years. Many of these methodologies follow the approaches of popular investment professionals, while others are tied to basic investment principles. These strategies run the gamut of investment styles, from those that are value-based to those that focus primarily on price momentum and growth. However, most fall somewhere in the middle.

These strategies are intended for educational purposes and are not merely buy and sell lists. Their primary purpose is to highlight what works—and what hasn't worked—when selecting stocks. While this annual recap article discusses, in-depth, the best- and worst-performing strategies for 2018, you can also review the long-term performance and see how these strategies performed in up and down

TABLE 1

Stocks Down at Least 20% From 52-Week High

	Total Universe	Down Stocks Number	%
<i>Stock Investor Pro</i> Database	6,180	4,017	65.0
Exchanges			
OTC	1,488	1,157	77.8
Nasdaq	2,522	1,652	65.5
Exchange-Listed	4,692	2,860	61.0
NYSE	1,962	1,051	53.6
Indexes			
S&P SmallCap 600	599	331	55.3
S&P MidCap 400	399	183	45.9
S&P 500	498	176	35.3
Dow Jones industrial average	30	5	16.7
Sectors			
Basic Materials	378	300	79.4
Energy	516	407	78.9
Healthcare	1,049	810	77.2
Consumer Cyclical	742	537	72.4
Technology	874	630	72.1
Industrials	810	534	65.9
Consumer Non-Cyclicals	277	174	62.8
Telecommunications Services	114	71	62.3
Financials	1,299	528	40.6
Utilities	121	26	21.5

Source AAIL's *Stock Investor Pro*/Thomson Reuters. Data as of 11/30/2018.

markets.

AAIL screens following the approach of a named investment professional do not represent their actual stock picks. The quantitative rules of each strategy are defined by our interpretations of their respective approaches. The results of the screening strategies, as well as the criteria for each approach, are programmed into AAIL's *Stock Investor Pro* and are posted in the Stock Ideas area of AAIL.com.

Each month, 59 separate screening strategies are run using *Stock Investor Pro*, and the current companies meeting the criteria of each strategy are also reported in the Stock Ideas section of AAIL.com. *Stock Investor Pro* subscribers can run the screening strategies themselves with the software (the data is updated daily, Tuesday through Saturday). AAIL members can access the month-end screening results by going to the Stock Ideas area of AAIL.com (www.aail.com/stock-ideas). The results are posted there on or

around the 15th of each month (excluding weekends and holidays) using data from the previous month's end.

Looking at the performance for the 59 AAIL stock strategies this year in Table 2 on pages 16 and 17, you can see that 2018 hasn't been an overly promising year for quantitative stock screening. Only 14 of the 59 screening methodologies AAIL tracks posted positive returns for the year through the end of November. Another—Foolish Small Cap 8 Revised—ended the year flat, which is attributable to the approach not yielding a single passing company all year. Ten of the AAIL screening strategies outperformed the S&P 500's 3.2% price gain through the end of November. The median price change of all AAIL stock screening strategies through November 30, 2018, was a 5.2% loss, compared to the price gain of 16.3% last year for the same set of screens. [Editor's note: At the request of Jordan Kimmel, AAIL no longer tracks the MAGNET approaches, one of which was the top performer last year.] None of the AAIL screening methodologies posted its best year over the backtesting period beginning in 1998. However, the William O'Neil CAN SLIM screen incurred its weakest year ever for the backtesting period, posting a 25.7% decline for the year through the end of November. The approach's worst year previously was

2015 when it posted a 10.5% decline. This year was only the sixth year over the 21-year testing period where the “original” CAN SLIM strategy posted a decline.

Table 2 summarizes the performance and variability of the screening strategies tracked on the Stock Ideas section of AAIL.com, ranked in descending order by year-to-date price change through the close on November 30 (see the The AAIL Stock Ideas box below for more information about them). All of the screening strategies that AAIL tracks have been developed and backtested using *Stock Investor Pro* and all but three—the Dogs of the Dow, Dogs of the Dow Low-Priced 5 and Magic Formula approaches—are prebuilt into the software. Table 2 also presents the price change performance (excluding dividends and transactions costs such as commissions, bid/ask spreads, time and price slippage, etc.) over various periods for each approach. New this year, we now categorize the screening strategies based on the “factors” that underlie each strategy. Factor investing has become a popular way to seek out excess returns.

Common factors used today include value, momentum, size, quality, volatility and yield. A key at the bottom of the table explains the initials and the Factor Categories of AAIL Screening Strategies box on page 26 further explains them.

For 2018 (through November 30), an approach that blends value, momentum and size factors—O’Shaughnessy Tiny Titans—led all AAIL strategies with a 31.1% gain through the end of November.

The year 2018, generally speaking, favored growth investing, continuing last year’s trend. Interestingly, though, growth at the large-cap and small-cap levels are neck and neck. Through the end of November, the S&P 500 Growth index posted a total return—including dividends—of 9.4% while the S&P SmallCap 600 Growth index had a year-to-date total return of 8.8%. The strength of growth investing is also reflected in the return of the Nasdaq 100 index, which includes the 100 largest non-financial companies listed on the tech-laden Nasdaq Stock Market. For the year, the Nasdaq 100 had a price gain of 8.6% through the end of November.

The AAIL Stock Ideas

AAIL has been developing, testing and refining a wide range of screening strategies over the years. Many of the screens follow the approaches of popular investment professionals, while others are tied to basic principles of investing. These approaches run the full spectrum, from those that are value-based to those that focus primarily on growth, while most fall somewhere in the middle.

Screens following the approach of an investment professional do not represent their actual stock picks. The rules of each screen are defined by our interpretations of their respective investment approaches. The results of the screening strategies, as well as the criteria for each screen, are programmed into the *Stock Investor Pro* program and are also posted in the Stock Ideas area of AAIL.com.

Each month, 59 separate screens are performed using AAIL’s *Stock Investor Pro* and the current companies passing each screen are reported. *Stock Investor Pro* subscribers can run the screens themselves on a daily basis, while AAIL members can access the screening results by going to the Stock Ideas area of AAIL.com (www.aail.com/stock-ideas). The results are posted to AAIL.com on the 15th of each month (excluding holidays and weekends) using data from the previous month’s end. The AAIL Stock Ideas Update email will notify you when the strategies have been updated on AAIL.com and provide a more in-depth look at a featured screen each month. You can sign up for this complimentary newsletter at www.aail.com/email.

The performance of the stocks passing each screen is tracked on a monthly basis. The month-to-month closing price is used to calculate the return, with equal investments in each stock at the beginning of each month assumed. The impact of

factors such as commissions, bid/ask spreads, time slippage (the time between the initial decision to buy a stock and the actual purchase) and taxes is not considered. This overstates the reported performance, but all approaches are subject to the same conditions and procedures. Higher turnover portfolios typically benefit more from these simplified rules.

Keep in mind, however, that performance figures for the AAIL stock screening strategies represent price change only, and do not include dividend payments or dividend reinvestment. Therefore, the results of screens that tend to isolate large, dividend-paying stocks—such as the Dogs of the Dow (in the value category)—do not receive a boost from dividend payments or reinvestment. The 10 stocks passing the Dogs of the Dow screen at the end of November were yielding 3.1%, compared to 3.5% at the end of November 2017; investors holding shares in these stocks, therefore, would have a higher annual return by approximately this amount for the coming year.

Sell rules are the same as the buy rules: The hypothetical portfolios are completely reallocated using each subsequent month’s data. Thus, a stock is sold (no longer included in the portfolio) if it ceases to meet the initial criteria, and new stocks are added if they qualify. Note that we use these rules for back-testing purposes but do not necessarily advocate them as part of a real-world investment framework.

Stocks that no longer qualify are dropped even if the strategist behind a particular approach suggests different sell rules versus buy rules. This may shorten the holding period and increase the turnover relative to what the strategist would suggest for an actual portfolio.

TABLE 2

Stock Ideas on AAIL.com Ranked by 2018 YTD Performance

	Price Gain (%)					Avg Annual Price Gain (%)			Price Gain (%)		Risk Measures		Holdings		Factors									
	YTD	2017	2016	2015	2014	10 Yr	Since Incep	Risk Adj	Bull Mkt*	Bear Mkt*	Volatility Index (X)	Draw-down (%)	Avg #	Turn-over (%)	V	G	M	S	E	E	Y	Q	I	O
O'Shaughnessy: Tiny Titans	31.1	(7.0)	21.0	(7.2)	25.7	18.3	22.4	15.3	618.2	(67.3)	1.93	(67.5)	25	40.6	V		MS							
Dogs of the Dow: Low Priced 5	14.6	(1.7)	13.0	11.7	3.0	10.2	3.6	1.4	433.2	(82.9)	1.54	(83.0)	5	16.8	V						Y			
Stock Market Winners	13.5	18.5	32.7	19.2	9.7	24.4	20.6	16.7	1,045.2	(51.3)	1.44	(57.3)	12	57.9	V	G	M							
Foolish Small Cap 8	11.6	(21.0)	8.8	17.2	(19.9)	8.5	8.9	8.2	182.4	(67.7)	2.40	(67.7)	13	46.2		G	MS							
Weiss Blue Chip Div Yield	7.8	15.2	18.5	(14.3)	5.4	13.2	10.0	9.5	298.4	(43.1)	1.25	(43.4)	11	24.7	V						Y	Q		
O'Neil's CAN SLIM Rev 3rd Ed	7.7	77.2	5.2	29.1	37.3	21.1	19.7	13.9	668.6	(27.8)	1.95	(38.5)	7	63.6		G	M							
Dogs of the Dow	7.3	3.5	22.9	(1.4)	6.8	11.1	4.0	3.2	346.3	(69.0)	1.20	(69.0)	10	7.9	V						Y			
Magic Formula	6.9	17.3	16.1	(13.1)	(16.5)	11.2	8.8	8.4	245.7	(51.6)	1.63	(55.3)	30	23.3	V							Q		
Wanger (Revised)	6.0	(16.4)	30.9	(2.1)	1.3	11.3	8.4	8.2	275.3	(51.3)	1.47	(51.3)	27	27.2	V	G		S						
Graham—Defensive Investor (Util)	5.7	(9.1)	13.5	(5.1)	16.0	4.8	6.8	6.8	77.2	(31.4)	1.06	(32.3)	16	14.2	V						Y	Q	I	
Neff	2.1	18.6	12.9	(21.7)	5.1	15.9	15.9	12.8	418.4	(52.8)	1.62	(61.0)	21	31.9	V	G								
Driehaus	1.1	15.4	24.1	17.2	(0.7)	24.3	13.4	10.3	996.3	(53.4)	2.24	(73.6)	14	64.1		G	M		EE					
O'Shaughnessy: Grth Mkt Leaders	0.1	29.2	5.2	(2.9)	2.3	11.5	7.6	7.6	267.5	(50.5)	1.24	(52.7)	10	43.2	V		M							
Est Rev: Lowest 30 Down	0.01	8.5	48.3	(12.7)	(20.4)	12.3	1.4	(6.8)	300.5	(71.0)	2.31	(77.2)	30	91.2					EE					
Foolish Small Cap 8 Revised	0.0	0.0	(18.3)	(2.8)	(2.1)	4.8	10.1	8.8	79.3	(64.0)	2.33	(65.1)	4	48.2	V	G	MS					Q		
O'Neil's CAN SLIM No Float	(0.3)	34.6	5.3	11.4	2.0	14.4	15.2	13.2	417.9	(61.6)	1.38	(64.2)	15	48.5		G	M							
Est Rev: Down 5%	(0.6)	17.5	23.1	(9.6)	(13.5)	10.4	1.5	(4.5)	237.5	(63.8)	1.95	(71.9)	72	89.3					EE					
Return on Equity	(1.2)	(1.5)	17.8	0.2	(8.8)	11.2	10.4	9.8	271.2	(47.2)	1.29	(47.2)	29	20.5		G						Q		
Cash Rich Firms	(1.3)	12.3	17.1	(7.8)	2.5	8.9	9.5	9.0	173.2	(45.6)	1.39	(45.6)	27	23.7	V							Q		
O'Shaughnessy: SmCp Grth & Val	(1.6)	27.8	9.7	(2.8)	2.4	12.6	16.6	13.5	389.8	(50.6)	1.54	(50.6)	25	49.8	V		MS							
Kirkpatrick Growth	(3.2)	7.4	12.8	(0.7)	(1.2)	8.9	13.2	10.4	193.5	(38.7)	2.08	(58.2)	13	60.7		G	M							
P/E Relative	(3.7)	18.1	24.3	(11.7)	5.3	15.5	14.3	13.4	333.6	(27.6)	1.15	(36.1)	40	76.0	V				EE					
Insider Net Purchases	(4.0)	27.8	(3.8)	(17.9)	(11.9)	3.3	(0.9)	(9.2)	114.1	(65.5)	1.95	(70.2)	29	30.3									0	
Rule #1 Investing	(4.0)	5.0	6.2	(46.0)	50.3	15.3	8.4	8.1	431.8	(54.0)	1.92	(63.5)	11	31.5	V	G						Q		
Lakonishok	(4.3)	19.4	28.5	(2.9)	13.0	16.9	13.8	12.7	452.1	(32.5)	1.22	(32.5)	32	90.1	V		M							
Price-to-Sales	(4.3)	18.6	36.9	(5.9)	(5.1)	15.4	14.0	12.4	479.6	(55.1)	1.36	(55.2)	51	39.1	V	G								
T. Rowe Price	(4.6)	22.0	30.8	17.4	4.4	22.4	11.1	9.6	982.0	(62.5)	1.76	(68.9)	7	51.6	V	G								
O'Shaughnessy: All Cap	(4.7)	9.8	46.8	(19.0)	(1.4)	10.0	11.2	10.1	230.5	(52.1)	1.47	(55.6)	21	33.2	V		M				Y			
InveStWare Quality Growth	(5.2)	1.5	(4.7)	(1.0)	21.6	10.3	6.0	5.5	186.9	(44.7)	1.28	(46.6)	17	11.6		G								
Buffett: Hagstrom	(5.2)	14.6	13.6	0.3	9.6	14.4	13.1	12.6	365.7	(39.8)	1.11	(42.3)	30	19.3	V	G						Q		
Dual Cash Flow	(5.3)	9.0	15.4	(17.2)	(3.2)	10.9	11.1	9.9	281.1	(61.0)	1.55	(63.2)	66	31.1		G						Q		
O'Shaughnessy: Growth	(5.9)	26.0	22.0	(5.5)	1.7	13.4	14.9	12.5	405.2	(57.2)	1.52	(57.2)	50	36.8	V		M							
Murphy Technology	(5.9)	(34.8)	(15.0)	(15.5)	(1.3)	2.6	(4.9)	(27.3)	15.4	(58.3)	2.77	(92.4)	9	21.4	V	G							I	
Graham—Defensive Inv (Non-Util)	(6.0)	5.8	22.0	(7.1)	(13.1)	14.0	13.5	11.9	356.4	(52.1)	1.39	(52.1)	22	18.9	V						Y	Q		
Dividend (High Relative Yield)	(6.1)	22.2	27.8	(10.3)	2.0	11.8	8.8	8.8	289.4	(40.4)	0.99	(44.3)	35	21.4	V	G						Y		
Dreman	(6.7)	21.0	12.3	(5.4)	7.7	12.3	9.7	9.3	280.0	(55.0)	1.25	(59.1)	22	30.7	V	G								
Est Rev: Top 30 Up	(6.9)	19.0	23.4	5.9	8.3	24.7	22.4	15.8	934.9	(37.8)	1.82	(57.5)	30	93.3					EE					
Value on the Move—PEG w/Hist Grth	(7.3)	26.1	18.6	6.7	3.5	15.2	13.7	13.2	416.7	(50.1)	1.08	(50.1)	73	35.6	V	G	M					Q		
O'Shaughnessy: Value	(7.5)	14.3	16.5	(12.5)	(5.8)	7.7	4.8	3.8	211.9	(69.1)	1.34	(55.3)	50	23.7	V						Y			
Value on the Move—PEG w/Est Grth	(8.1)	23.3	8.1	2.8	8.9	15.0	17.0	14.6	424.0	(50.2)	1.35	(50.2)	34	43.7	V	G	M					Q		
Templeton	(8.5)	10.9	24.5	(15.0)	13.0	15.3	9.4	9.0	300.3	(40.0)	1.27	(43.9)	19	28.6	V	G								
Est Rev: Up 5%	(9.6)	6.1	24.4	(0.1)	1.1	19.4	22.3	15.9	560.9	(23.4)	1.77	(46.9)	39	92.7					EE					
Lynch	(10.0)	15.7	10.3	(15.0)	(7.2)	7.0	9.0	8.7	111.2	(47.5)	1.27	(47.6)	24	21.1	V									
Schloss	(10.6)	3.9	(4.4)	(20.4)	(5.9)	0.3	6.6	5.5	26.7	(37.6)	2.02	(63.5)	12	55.1										
Buffettology: Sustainable Grth	(10.8)	18.3	24.2	3.3	3.2	15.5	10.8	10.1	424.9	(41.9)	1.29	(43.6)	29	14.1		G						Q		
Fundamental Rule of Thumb	(10.8)	16.3	25.7	(1.8)	(11.6)	9.9	11.7	10.1	221.2	(57.0)	1.69	(57.0)	50	21.0	V									
Kirkpatrick Bargain	(11.9)	19.4	(0.8)	(8.4)	5.9	5.6	6.4	5.9	147.8	(43.2)	1.36	(43.2)	19	63.1	V		M							
Price-to-Free-Cash-Flow	(12.5)	4.6	22.6	0.5	12.4	25.1	17.2	13.0	1,153.9	(62.8)	1.78	(69.1)	30	21.3	V									

(Continued on next page)

TABLE 2

Stock Ideas on AAIL.com Ranked by 2018 YTD Performance (cont'd)

						Avg Annual			Price		Risk Measures		Holdings									
	Price Gain (%)					Price Gain (%)			Gain (%)		Volatility Index (X)	Draw-down (%)	Turn-over (%)	Factors								
	YTD	2017	2016	2015	2014	10 Yr	Since Incep	Risk Adj	Bull Mkt*	Bear Mkt*				V	G	M	S	EE	Y	Q	I	O
Buffettology: EPS Growth	(12.6)	24.4	15.1	2.5	4.4	15.8	10.2	9.8	460.2	(48.4)	1.22	(48.9)	42	12.2	G					Q		
Graham—Enterprising Inv Rev	(15.5)	(11.0)	25.8	1.2	41.9	16.5	17.4	13.2	495.1	(49.9)	1.79	(60.2)	8	27.2	V					Y Q		
Muhlenkamp	(16.5)	0.4	10.7	11.2	(48.5)	(9.1)	(0.1)	(4.6)	(48.0)	(49.0)	1.56	(84.2)	17	23.9	V	G				Q		
ADR Screen	(16.6)	41.7	26.5	(7.0)	27.3	13.3	9.0	8.6	349.6	(68.7)	1.48	(68.7)	24	44.1	V		M					
Piotroski: High F-Score (8)	(17.1)	3.0	24.4	(40.5)	(0.3)	21.2	20.5	13.9	791.8	(53.6)	2.07	(59.0)	18	22.4	V					Q		
Dreman With Est Revisions	(18.2)	25.7	9.7	6.4	14.2	18.1	14.2	12.5	477.9	(39.9)	1.36	(46.3)	12	84.0	V	G		EE				
Zweig	(18.9)	20.6	10.6	(5.7)	(14.6)	0.9	14.0	11.0	71.1	(54.4)	1.93	(57.0)	10	41.6	V	G				Q		
O’Neil’s CAN SLIM	(25.7)	30.8	15.3	(10.5)	44.1	11.9	19.9	14.1	253.5	(10.1)	1.92	(33.2)	6	56.2		G	M					
Kirkpatrick Value	(28.7)	29.6	2.5	(6.4)	(15.1)	(4.4)	7.3	6.7	10.5	(23.3)	2.23	(53.5)	3	71.6	V	G	M					
Fisher (Philip)	(30.4)	97.3	(10.9)	22.7	(1.3)	9.5	5.2	1.9	192.4	(58.2)	2.30	(59.9)	16	32.6	V	G						
Oberweis Octagon	(35.0)	20.1	44.7	(19.1)	(5.9)	9.1	10.2	9.0	261.3	(70.6)	1.95	(71.5)	14	41.4	V	G	M					

Indexes	Price Gain (%)					Average Annual Price Gain (%)			Price Gain (%)		Risk Measures	
	YTD	2017	2016	2015	2014	10 Yr	Since Incep	Risk Adj	Bull Mkt*	Bear Mkt*	Volatility Index (X)	Draw-down (%)
S&P 500	3.2	19.4	9.5	(0.7)	11.4	11.9	5.1	5.1	296.4	(52.6)	1.00	(52.6)
S&P 500 Growth (w/divs)	9.4	27.4	6.9	5.5	14.9	16.0	7.3	7.3	436.5	(44.4)	1.10	(57.8)
S&P 500 Value (w/divs)	0.6	15.4	17.4	(3.1)	12.5	12.4	6.4	6.4	331.4	(56.0)	1.00	(56.4)
S&P MidCap 400	(1.2)	14.5	18.7	(3.7)	8.2	13.8	8.6	8.5	349.3	(50.5)	1.19	(51.0)
S&P MidCap 400 Growth (w/divs)	1.1	19.9	14.8	2.0	7.6	16.2	11.5	10.6	434.5	(47.7)	1.29	(47.7)
S&P MidCap 400 Value (w/divs)	(0.6)	12.3	26.5	(6.7)	12.1	14.9	8.6	8.5	402.2	(49.4)	1.12	(51.2)
S&P SmallCap 600	2.9	11.7	24.7	(3.4)	4.4	14.3	8.3	8.2	415.6	(52.2)	1.28	(53.2)
S&P SmallCap 600 Growth (w/divs)	8.8	14.8	22.1	2.8	3.9	17.2	10.0	9.4	547.9	(51.1)	1.32	(51.1)
S&P SmallCap 600 Value (w/divs)	(0.4)	11.5	31.3	(6.7)	7.5	14.0	8.7	8.5	411.7	(51.0)	1.24	(53.8)
Dow Jones 30	3.3	25.1	13.4	(2.2)	7.5	11.2	5.8	5.8	274.6	(49.3)	0.98	(49.3)
NASDAQ 100	8.6	31.5	5.9	8.4	17.9	19.3	9.8	8.9	582.9	(50.1)	1.77	(81.5)
All Exchange-Listed Stocks	(4.8)	15.6	17.1	(11.6)	5.0	13.7	9.2	8.8	353.2	(58.6)	1.37	(59.7)

Factors Key

V = Value
G = Growth
M = Momentum
S = Size
EE = Earnings Estimates
Y = Yield
Q = Quality
I = Industry/Sector
O = Other

Unless otherwise stated with (w/divs), figures do not include dividends or transaction costs.

*Bull market period is March 1, 2009, through September 30, 2018. Bear market period is November 1, 2007, through February 28, 2009.

Source: AAIL's Stock Investor Pro/Thomson Reuters. Data as of 11/30/2018.

In comparison to growth investing, value investing struggled this year across all market-cap segments. The total returns of the S&P MidCap 400 Value and S&P SmallCap 600 Value indexes were negative through the end of November, while the S&P 500 Value index posted a year-to-date total return of 0.6%.

It is worth mentioning that all of the S&P style and market-cap indexes are market-cap weighted, which means the largest stocks in each of the indexes have a greater impact on the index's overall performance. Indicative of the continued relative strength of larger stocks this year, the typical exchange-listed stock saw its shares fall by 4.8% through the end of November. As of November 30, 2018, the median market capitalization of all exchange-listed (non-OTC) companies in *Stock Investor Pro* was around \$918 million.

Moderating Market Valuations

The uneven year in stock prices pushed valuations lower from their 20-year highs of a year ago across all market-cap segments. Table 3 shows the median trailing price-earnings (P/E), price-to-book-value (P/B) ratio, price-to-sales (P/S) ratio and dividend yield for the constituents for the S&P 500, S&P MidCap 400 and S&P SmallCap 600 indexes as of the end of each year from 1998 through 2017 and as of the end November 2018. These figures were calculated by taking the median values of the stocks tracked by *Stock Investor Pro* that are in each of these three S&P indexes.

The chart in Figure 1 represents the trend in the median end-of-year price-to-book-value ratios for each of the S&P market-cap indexes. These trends generally track those exhibited by the multiples in Table 3. All three indexes

saw the median price-to-book-value ratio of their underlying stock climb significantly in the post-financial-crisis period. After falling to their lowest levels since 1998 at the end of 2008 for all three indexes, there was a sharp rebound in the nine proceeding years. During that time, the spreads between the price-to-book-value ratios for the three indexes have also widened. The median price-to-book-value ratios for both the S&P 500 and S&P MidCap 400 indexes hit 20-year highs in 2017 at 3.40 and 2.61, respectively. The S&P SmallCap 600 saw the median price-to-book-value ratio of its constituents hit a high of 2.23 at the end of 2016 and ended

2017 at 2.20. In 2018, as of the end of November, the median price-to-book-value ratios for the underlying stocks of the three indexes had fallen from the 2017 values: The S&P 500 price-to-book-value ratio was 3.18, while it was 2.28 for the S&P MidCap 400 and 1.92 for the S&P SmallCap 600 index.

TABLE 3

Median Multiples for Market-Cap Indexes

	Price-Earnings (X)			Price-to-Book (X)			Price-to-Sales (X)			Dividend Yield (%)		
	S&P 500	S&P MidCap	S&P SmallCap	S&P 500	S&P MidCap	S&P SmallCap	S&P 500	S&P MidCap	S&P SmallCap	S&P 500	S&P MidCap	S&P SmallCap
Dec 1998	23.3	19.3	18.0	3.07	2.49	2.03	1.46	1.22	0.97	1.5	0.9	0.0
Dec 1999	22.2	17.0	16.6	3.08	2.10	1.89	1.52	1.13	0.90	1.5	0.9	0.0
Dec 2000	20.7	18.4	15.1	3.11	2.49	1.85	1.59	1.29	0.91	1.1	0.3	0.0
Dec 2001	24.2	22.1	20.1	2.76	2.35	1.95	1.53	1.33	1.05	1.2	0.3	0.0
Dec 2002	20.6	18.5	18.0	2.27	1.91	1.63	1.91	1.19	0.97	1.2	0.1	0.0
Dec 2003	22.3	21.6	22.2	2.82	2.34	2.09	1.64	1.53	1.26	1.2	0.4	0.0
Dec 2004	20.8	21.9	23.6	2.89	2.50	2.20	1.77	1.59	1.38	1.1	0.5	0.0
Dec 2005	19.0	21.0	21.0	2.80	2.53	2.15	1.69	1.50	1.24	1.2	0.6	0.0
Dec 2006	19.4	20.0	21.5	2.89	2.51	2.28	1.73	1.41	1.44	1.2	0.8	0.0
Dec 2007	18.1	18.7	18.9	2.93	2.38	1.96	1.59	1.38	1.25	1.4	0.7	0.0
Dec 2008	11.7	12.8	13.8	1.67	1.37	1.20	0.91	0.82	0.71	2.1	1.2	0.0
Dec 2009	18.5	20.7	20.5	2.29	1.92	1.61	1.41	1.34	1.10	1.4	0.6	0.0
Dec 2010	17.8	20.3	21.7	2.46	2.15	1.79	1.64	1.51	1.30	1.3	0.8	0.0
Dec 2011	15.7	17.6	18.0	2.26	1.93	1.60	1.46	1.31	1.11	1.9	1.1	0.0
Dec 2012	17.3	18.6	19.5	2.38	2.02	1.72	1.62	1.41	1.14	2.0	1.2	0.0
Dec 2013	21.2	22.6	24.4	3.06	2.56	2.21	2.05	1.90	1.60	1.7	1.2	0.1
Dec 2014	21.5	22.5	23.8	3.18	2.49	2.12	2.18	1.83	1.51	1.8	1.3	0.6
Dec 2015	20.7	20.4	20.9	2.89	2.27	1.80	2.12	1.60	1.36	2.1	1.6	0.7
Dec 2016	21.5	22.9	25.6	3.20	2.49	2.23	2.42	1.94	1.59	1.9	1.3	0.4
Dec 2017	24.5	23.5	26.5	3.40	2.61	2.20	2.64	2.06	1.63	1.7	1.2	0.4
Nov 2018	20.5	18.9	21.3	3.18	2.28	1.92	2.52	1.94	1.55	1.9	1.3	0.5

Source: AAI's Stock Investor Pro/Thomson Reuters. Data as of 11/30/2018.

The Top Strategy for 2018

Nearly duplicating last year's turnaround, this year's top-performing screening strategy ranked near the bottom in 2017. This year the O'Shaughnessy Tiny Titans approach leads the way with a 31.1% price gain through the end of November, after ranking sixth-worst last year with a price decline of 7.0%.

AAII tracks several screens from James O'Shaughnessy, the founder and chairman of O'Shaughnessy Asset Management LLC, an asset management firm headquartered in Stamford, Connecticut. The O'Shaughnessy screens that AAI has developed are based on the strategies outlined in his books "What Works on Wall Street: A Guide to the Best-Performing Investment Strategies of All Time," (3rd Edition, 2005, McGraw-Hill) and "Predicting the Markets of Tomorrow: A Contrarian Investment Strategy for the Next Twenty Years," (2006, Penguin Group). It is from the

latter book that the concept of the Tiny Titans approach was derived.

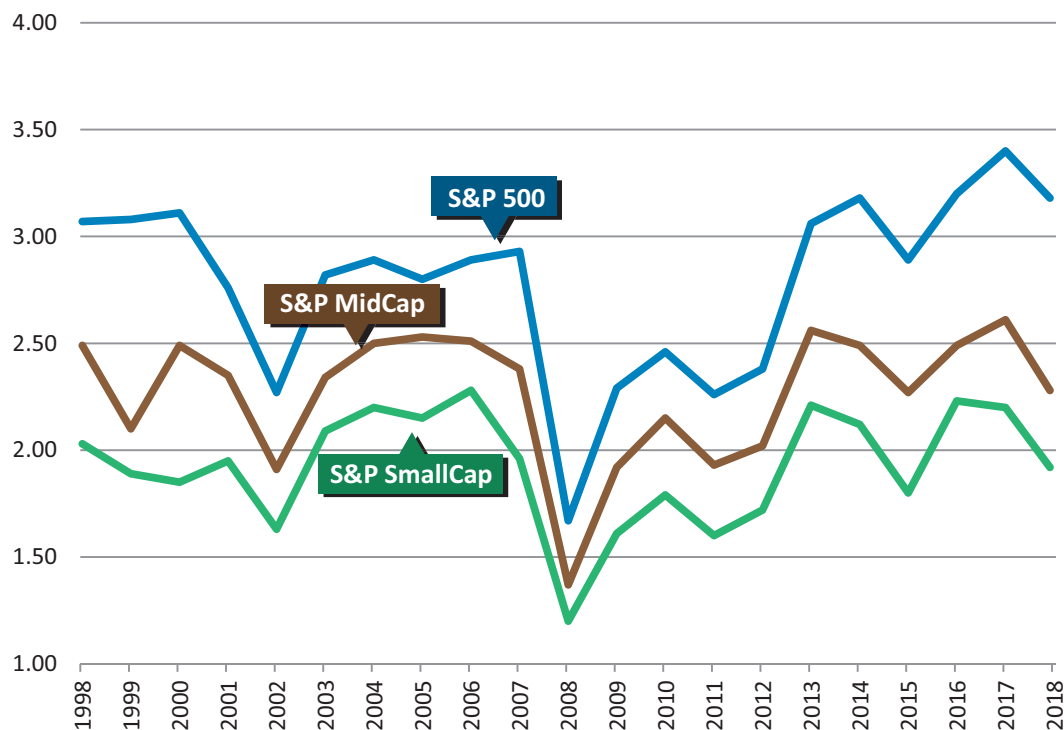
O'Shaughnessy's research dates back to the late 1790s and found that equity markets tend to move in trends of about 20 years. According to this pattern, a 20-year trend began in early 2000 during which greater returns will be earned by small- and mid-cap stocks and large-cap value stocks. The previous 20-year cycle favored large-cap growth stocks, while small- and mid-cap stocks and large-cap value stocks were, on average, underperforming the market.

The Tiny Titans approach focuses on low-price micro-cap stocks. Much research has been done regarding the success of investing in this market-cap category. AAI's Model Shadow Stock Portfolio is based on a study that showed that small- and micro-cap stocks tend to outperform the overall market over long periods.

O'Shaughnessy believes the reason for this outperformance is that few analysts follow these small stocks. Also, many institutional investors and mutual funds cannot trade these stocks without moving the price due to the relatively small number of outstanding shares. This leaves room for surprises, which can lead to a performance "pop." O'Shaughnessy also says that micro-cap stocks have a low correlation with the overall stock market, making them a potential hedge in a portfolio of larger-cap stocks.

FIGURE 1

Price-to-Book Ratio Year-End Median Values



AAIL's version of O'Shaughnessy's Tiny Titans stock screen consists of very few criteria. First, all foreign stocks and over-the-counter stocks are eliminated. Next, a stock's market capitalization must be between \$25 million and \$250 million. For the universe of exchange-listed (non-OTC) stocks as of the end of November, the median market cap was \$917.5 million and the average was \$8,477.5 million.

After filtering out the larger-capitalization stocks, the Tiny Titans screen looks for stocks with price-to-sales ratios of less than 1.0. O'Shaughnessy uses this as a proxy for "cheapness," as opposed to a price-earnings ratio. He reasons that all viable companies have sales, and sales are harder to manipulate than earnings. In his book "What Works on Wall Street," O'Shaughnessy found that stocks with low price-to-sales ratios produced higher returns. As of November 30, 2018, a price-to-sales ratio of 1.0 ranked in the bottom 30% of all U.S.-listed stocks.

Finally, O'Shaughnessy thinks investors should hold 25 stocks in this micro-cap portfolio to diversify the risk that goes along with holding such volatile stocks. He narrowed the list to the 25 stocks with the highest 52-week relative strength as compared to the S&P 500. So, on a monthly basis, we track only those 25 companies with the highest 52-week relative strength. As of the end of November, the 25 companies passing the O'Shaughnessy Tiny Titans strategy ranked in the top 88% of all stocks regarding 52-week relative price strength.

For a stock investment strategy to be useful, it must be investable. That means a quantitative approach needs to generate a large enough universe of passing companies on which to perform additional due diligence to identify investment candidates. Since the O'Shaughnessy Tiny Titans screen looks for the 25 companies with the highest price strength over the last year after applying the market cap and value filters, there are always companies passing. Keep in mind, however, that there may be periods when the companies with the "best" price strength may still be down over the last 52 weeks. The Tiny Titans methodology looks for those companies with

the strongest price performance, but not necessarily a positive price change.

The average monthly price returns in 2018 for the stocks comprising the O'Shaughnessy Tiny Titans screen's hypothetical portfolio ranged from a loss of 10.7% in November to a gain of 17.8% in March.

Other Top-Performing Strategies

Three of the most widely tracked investment factors are value, growth and momentum, and many of this year's top AAIL screening strategies capture one or more of these factors.

Of the 10 AAIL screening methodologies that beat the S&P 500 through the end of November, eight had a value component to them. Value investing entails buying shares of unappreciated or neglected companies at attractive prices. Investment gurus such as David Dreman and Benjamin Graham believe that investors tend to pay too much for companies that appear to have the best prospects at the moment and react too negatively to companies considered to have the weakest prospects. This is a behavioral bias that is best overcome by using a quantitative approach or model with rules to help us overcome our natural inclinations. The mispricing of securities tends to be a self-correcting process that contrarian investors can use to their advantage.

The price-earnings ratio, or earnings multiple, is the most common valuation metric used in the stock screening strategies tracked by AAIL. The basic price-earnings ratio is computed by dividing the current stock price by earnings per share for the most recent 12 months. It is followed so closely because it relates the market's expectation of future company performance, embedded in the price component of the equation, to the company's actual recent earnings performance. The greater the expectation, the higher the multiple of current earnings investors are willing to pay for the promise of future earnings. If the market has low earnings growth expectations for a firm, or views earnings as suspect, it will not be willing to pay as much per share as it would for a firm with high and more certain earnings growth expectations.

The price-to-book-value ratio is the second most common value filter found in the value screens on AAIL.com. The price-to-book-value ratio is determined by dividing market price per share by book value per share. Book value is generally determined by subtracting total liabilities from total assets and then dividing by the number of shares outstanding. It represents the value of the owners' equity based on historical accounting decisions. If accounting truly captured the current values of the firm, then one would expect the current stock price to sell near its accounting book value. Over the history of a firm, many events occur that can distort the book value figure. For example, inflation may leave the replacement cost of capital goods within the firm far above their stated book value.

We also have examples of successful value stock approaches that employ the price-to-sales ratio—such as the O'Shaughnessy Tiny Titans approach—the price-to-cash-flow ratio or the dividend yield.

The bottom line is that you can identify attractively priced stocks with a variety of price multiples, but successful investors become experts in the strengths and weaknesses of a given multiple and use their value test as the first step in the selection process.

Generally speaking, you shouldn't merely be looking for the cheapest stocks, just stocks that are trading below the market norm or below the firm's past average multiple.

Four of AAIL's screening strategies that beat the S&P 500 year to date have a growth factor component. Stock prices, in the long term, are driven by a company's ability to generate earnings. When trying to identify growth companies, your primary screen should provide you with a list of companies that are in the growth stage of their life cycle, not mature cyclical firms.

Many growth screens focus specifically on earnings growth (although growth in sales, cash flow and dividends may also be considered), such as:

- » Specify minimum absolute level of historical earnings per share growth,
- » Specify minimum absolute level of forecasted earnings per share growth,

- » Specify growth rate above the industry average,
- » Specify industries that are expanding at rates above that of the economy,
- » Require positive increase in annual earnings for each of the individual periods of analysis,
- » Require increasing growth rates in earnings from period to period,
- » Require year-over-year quarterly earnings increases, or
- » Require acceleration in year-over-year quarterly earnings growth.

Another common thread running through successful screening strategies is price momentum. Four of the 10 screening approaches AAIL tracks that outperformed the S&P 500 this year had a momentum component. We can evaluate a stock's price momentum by looking at its percentage change over a given period—for example, six months. However, it's hard to say if being up 25% over the last six months or falling 25% is good or bad without context. We obviously would like to see our stocks go up, if we have a long position. But if our stock is up 25% over the last six months and the market is up 50%, the performance loses some of its luster. Likewise, if the market is down 50%, but our stock is down "only" 25%, we probably wouldn't complain quite so much. For this reason, relative price strength is often a popular measure of a stock's price momentum.

Using price momentum filters in conjunction with value-oriented filters has been found to enhance the performance of value strategies, too, by lessening the likelihood of buying into a "value trap"—a stock with a depressed price that remains depressed.

Momentum filters focus on changes or acceleration in price, such as:

- » Company price increasing faster than market price increase (high relative price index),
- » Company price increasing faster than other stocks (high relative price percentile rank),
- » Company price hitting new 52-week high levels, or
- » Short-term relative price strength greater than long-term relative price strength.

In *Stock Investor Pro*, the relative strength index is calculated against the performance of the iShares S&P 500 ETF (IVV), which is used as a proxy for the S&P 500 index. Stocks with performance equal to that of the S&P 500 over the last 52 weeks have a relative strength index of 0%. A relative strength index value of 10% indicates that the stock outperformed the S&P 500 by 10%. Negative index numbers indicate underperformance relative to the index: A relative strength index reading of -5% means the stock has underperformed the S&P 500 by 5%.

Relative strength rank values compare a stock's relative price performance against all other U.S.-listed stocks. So, a company with a 26-week relative price rank value of 90% ranks in the top 10% of all U.S. stocks in terms of relative price strength over the last six months (90% of all

U.S. stocks have a weaker relative price strength over that period).

As mentioned earlier, the O'Shaughnessy Tiny Titans approach looks for micro-cap companies (size is another factor that research has shown to generate market-beating returns) with low price-to-sales ratios (value) and strong relative price strength (momentum).

The second-best-performing AAI screening approach for 2018 is the Dogs of the Dow: Low Priced 5, which is up 14.6% through the end of November. This approach focuses on the 30 companies that make up the Dow Jones industrial average and selects the five lowest-priced stocks (value factor) from the 10 Dow stocks with the highest dividend yields (yield factor).

AAII's Stock Market Winners strategy, which has gained 13.5% for the year, is based on research performed by William O'Neil of CAN SLIM fame. Initially, O'Neil analyzed the common traits of the 500 biggest stock market winners dating back to 1953. The results of this study formed the basis of O'Neil's CAN SLIM screening methodology. In the article "Investment Characteristics of Stock Market Winners," from the September 1989 issue of the *AAII Journal*, Marc Reinganum examined the common traits of 222 stocks highlighted in a publication by William O'Neil & Co. titled "The Greatest Stock Market Winners: 1970–1983" to establish the characteristics that were common to these stocks prior to their rise to prominence. Based on his analysis, Reinganum came up with nine trading rules to help identify potential future winners. The approach includes the value factor of price-to-book-value ratio less than 1.0; the momentum factors of relative price strength of at least 70, relative strength rank in the current quarter that is greater than the rank in the previous quarter and current stock price that is within 15% of its two-year high; and the growth factors of accelerating quarterly earnings and positive five-year growth rate in earnings.

The AAI Foolish Small Cap 8 methodology captures growth, momentum and size factors. For the year, it gained 11.6% through the close on November 30, 2018. From a growth perspective, the strategy requires recent earnings and sales growth of at least 25%. The strategy's momentum element seeks out companies with relative strength greater than 90%. Lastly, the Foolish 8 screening strategy caps a company's annual sales at \$500 million, which is used to identify smaller companies.

Rounding out the top five screens for 2018 is the Weiss Blue Chip Dividend Yield approach. This strategy makes use of yet another investment factor—yield (or carry)—as well as value and quality. Looking at dividends and yield, the approach requires that a company's dividend must have increased over the last six years and that the dividend yield is within 10% of the seven-year average high yield. This level of yield also indicates that a stock is historically undervalued. From a quality standpoint, the strategy restricts the level of long-term debt to equity.

The Weakest Strategy for 2018

We nearly had a first-to-worst for this year, as the Philip Fisher approach, which ended last year as AAI's best-performing screening strategy with a price gain of 97.3%, is down 30.4% through the end of November. This, however, placed the Fisher approach in the second-to-last position. The poorest-performing methodology for the year is the Oberweis Octagon approach.

The screening strategy integrates value, growth and momentum factors that stem from eight points that make up the Oberweis Octagon. They include:

- » Rapid annual growth in revenue (growth)
- » Rapid annual growth in pretax income (growth)
- » Acceleration in the growth of sales and earnings (growth)
- » Low price-earnings ratio in relation to the underlying growth (value)
- » Low price-to-sales ratio (value)
- » Strong relative price strength (momentum)

Historical Performance

Because this is an annual recap article, Table 2 ranks all the screening strategies that AAI tracks based on year-to-date price change. However, saying that a strategy is "good" or "bad" based on one year of performance isn't practical or realistic.

Therefore, Table 4 ranks the AAI stock screening strategies over a longer period—specifically, on average annual price gain over the last 10 years. Ten years is typically a long enough period to be meaningful and long enough to capture at least one full economic cycle.

It's worth noting that we are now 10 years removed from the financial crisis. That means that, for many of the strategies AAI tracks, their worst year on record is not included in this 10-year performance figure. As a result, we have seen some changes at the top regarding long-term performance.

The Price-to-Free-Cash-Flow approach continued its ascent this year and has reached the apex in terms of 10-year performance, with the best average annual price change over the last 10 years at 25.1%. The strategy supplanted the Estimate Revisions Top 30 Up methodology from the top spot, although it is a close second with a 10-year average annual price gain of 24.7%. The Stock Market Winners approach remains in third place with an average annual price gain of 24.4% over the last 10 years. Rounding out the top five, though, are two newcomers: The Richard Driehaus approach (24.3% average annual price gain over the last 10 years) and the T. Rowe Price strategy (22.4% 10-year average annual price gain).

The Price-to-Free-Cash-Flow approach requires companies to have positive free cash flow per share for each of the last five years as well as a price-to-free-cash-flow ratio that is below the industry median and the five-year average.

TABLE 4

Stock Ideas on AAIL.com Ranked by 10-Year Performance

	Average Annual Price Gain (%)			Price Gain (%)					Price Gain (%)		Risk Measures		Holdings		Factors									
	10 Yr	Since Incep	Risk Adj	YTD	2017	2016	2015	2014	Bull Mkt*	Bear Mkt*	Volatility Index (X)	Draw-down (%)	Avg #	Turn-over (%)										
															V	G	M	S	E	E	Y	Q	I	O
Price-to-Free-Cash-Flow	25.1	17.2	13.0	(12.5)	4.6	22.6	0.5	12.4	1,153.9	(62.8)	1.78	(69.1)	30	21.3	V									
Est Rev: Top 30 Up	24.7	22.4	15.8	(6.9)	19.0	23.4	5.9	8.3	934.9	(37.8)	1.82	(57.5)	30	93.3						EE				
Stock Market Winners	24.4	20.6	16.7	13.5	18.5	32.7	19.2	9.7	1,045.2	(51.3)	1.44	(57.3)	12	57.9	V	G	M							
Driehaus	24.3	13.4	10.3	1.1	15.4	24.1	17.2	(0.7)	996.3	(53.4)	2.24	(73.6)	14	64.1		G	M	S	EE					
T. Rowe Price	22.4	11.1	9.6	(4.6)	22.0	30.8	17.4	4.4	982.0	(62.5)	1.76	(68.9)	7	51.6	V	G								
Piotroski: High F-Score (8)	21.2	20.5	13.9	(17.1)	3.0	24.4	(40.5)	(0.3)	791.8	(53.6)	2.07	(59.0)	18	22.4	V							Q		
O'Neil's CAN SLIM Rev 3rd Ed	21.1	19.7	13.9	7.7	77.2	5.2	29.1	37.3	668.6	(27.8)	1.95	(38.5)	7	63.6		G	M							
Est Rev: Up 5%	19.4	22.3	15.9	(9.6)	6.1	24.4	(0.1)	1.1	560.9	(23.4)	1.77	(46.9)	39	92.7						EE				
O'Shaughnessy: Tiny Titans	18.3	22.4	15.3	31.1	(7.0)	21.0	(7.2)	25.7	618.2	(67.3)	1.93	(67.5)	25	40.6	V			MS						
Dreman With Est Revisions	18.1	14.2	12.5	(18.2)	25.7	9.7	6.4	14.2	477.9	(39.9)	1.36	(46.3)	12	84.0	V	G			EE					
Lakonishok	16.9	13.8	12.7	(4.3)	19.4	28.5	(2.9)	13.0	452.1	(32.5)	1.22	(32.5)	32	90.1	V		M							
Graham—Enterprising Inv Rev	16.5	17.4	13.2	(15.5)	(11.0)	25.8	1.2	41.9	495.1	(49.9)	1.79	(60.2)	8	27.2	V						Y	Q		
Neff	15.9	15.9	12.8	2.1	18.6	12.9	(21.7)	5.1	418.4	(52.8)	1.62	(61.0)	21	31.9	V	G								
Buffettology: EPS Growth	15.8	10.2	9.8	(12.6)	24.4	15.1	2.5	4.4	460.2	(48.4)	1.22	(48.9)	42	12.2		G						Q		
Buffettology: Sustainable Growth	15.5	10.8	10.1	(10.8)	18.3	24.2	3.3	3.2	424.9	(41.9)	1.29	(43.6)	29	14.1		G						Q		
P/E Relative	15.5	14.3	13.4	(3.7)	18.1	24.3	(11.7)	5.3	333.6	(27.6)	1.15	(36.1)	40	76.0	V				EE					
Price-to-Sales	15.4	14.0	12.4	(4.3)	18.6	36.9	(5.9)	(5.1)	479.6	(55.1)	1.36	(55.2)	51	39.1	V	G								
Templeton	15.3	9.4	9.0	(8.5)	10.9	24.5	(15.0)	13.0	300.3	(40.0)	1.27	(43.9)	19	28.6	V	G								
Rule #1 Investing	15.3	8.4	8.1	(4.0)	5.0	6.2	(46.0)	50.3	431.8	(54.0)	1.92	(63.5)	11	31.5	V	G						Q		
Value on the Move—PEG w/Hist Grth	15.2	13.7	13.2	(7.3)	26.1	18.6	6.7	3.5	416.7	(50.1)	1.08	(50.1)	73	35.6	V	G	M					Q		
Value on the Move—PEG w/Est Grth	15.0	17.0	14.6	(8.1)	23.3	8.1	2.8	8.9	424.0	(50.2)	1.35	(50.2)	34	43.7	V	G	M					Q		
O'Neil's CAN SLIM No Float	14.4	15.2	13.2	(0.3)	34.6	5.3	11.4	2.0	417.9	(61.6)	1.38	(64.2)	15	48.5		G	M							
Buffett: Hagstrom	14.4	13.1	12.6	(5.2)	14.6	13.6	0.3	9.6	365.7	(39.8)	1.11	(42.3)	30	19.3	V	G						Q		
Graham—Defensive Inv (Non-Util)	14.0	13.5	11.9	(6.0)	5.8	22.0	(7.1)	(13.1)	356.4	(52.1)	1.39	(52.1)	22	18.9	V						Y	Q		
O'Shaughnessy: Growth	13.4	14.9	12.5	(5.9)	26.0	22.0	(5.5)	1.7	405.2	(57.2)	1.52	(57.2)	50	36.8	V		M							
ADR Screen	13.3	9.0	8.6	(16.6)	41.7	26.5	(7.0)	27.3	349.6	(68.7)	1.48	(68.7)	24	44.1	V		M							
Weiss Blue Chip Div Yield	13.2	10.0	9.5	7.8	15.2	18.5	(14.3)	5.4	298.4	(43.1)	1.25	(43.4)	11	24.7	V							Y	Q	
O'Shaughnessy: SmCp Grth & Val	12.6	16.6	13.5	(1.6)	27.8	9.7	(2.8)	2.4	389.8	(50.6)	1.54	(50.6)	25	49.8	V		MS							
Dreman	12.3	9.7	9.3	(6.7)	21.0	12.3	(5.4)	7.7	280.0	(55.0)	1.25	(59.1)	22	30.7	V	G								
Est Rev: Lowest 30 Down	12.3	1.4	(6.8)	0.01	8.5	48.3	(12.7)	(20.4)	300.5	(71.0)	2.31	(77.2)	30	91.2						EE				
O'Neil's CAN SLIM	11.9	19.9	14.1	(25.7)	30.8	15.3	(10.5)	44.1	253.5	(10.1)	1.92	(33.2)	6	56.2		G	M							
Dividend (High Relative Yield)	11.8	8.8	8.8	(6.1)	22.2	27.8	(10.3)	2.0	289.4	(40.4)	0.99	(44.3)	35	21.4	V	G					Y			
O'Shaughnessy: Grth Mkt Leaders	11.5	7.6	7.6	0.1	29.2	5.2	(2.9)	2.3	267.5	(50.5)	1.24	(52.7)	10	43.2	V		M							
Wanger (Revised)	11.3	8.4	8.2	6.0	(16.4)	30.9	(2.1)	1.3	275.3	(51.3)	1.47	(51.3)	27	27.2	V	G		S						
Magic Formula	11.2	8.8	8.4	6.9	17.3	16.1	(13.1)	(16.5)	245.7	(51.6)	1.63	(55.3)	30	23.3	V							Q		
Return on Equity	11.2	10.4	9.8	(1.2)	(1.5)	17.8	0.2	(8.8)	271.2	(47.2)	1.29	(47.2)	29	20.5		G							Q	
Dogs of the Dow	11.1	4.0	3.2	7.3	3.5	22.9	(1.4)	6.8	346.3	(69.0)	1.20	(69.0)	10	7.9	V						Y			
Dual Cash Flow	10.9	11.1	9.9	(5.3)	9.0	15.4	(17.2)	(3.2)	281.1	(61.0)	1.55	(63.2)	66	31.1		G						Q		
Est Rev: Down 5%	10.4	1.5	(4.5)	(0.6)	17.5	23.1	(9.6)	(13.5)	237.5	(63.8)	1.95	(71.9)	72	89.3						EE				
InveStWare Quality Growth	10.3	6.0	5.5	(5.2)	1.5	(4.7)	(1.0)	21.6	186.9	(44.7)	1.28	(46.6)	17	11.6		G								
Dogs of the Dow: Low Priced 5	10.2	3.6	1.4	14.6	(1.7)	13.0	11.7	3.0	433.2	(82.9)	1.54	(83.0)	5	16.8	V						Y			
O'Shaughnessy: All Cap	10.0	11.2	10.1	(4.7)	9.8	46.8	(19.0)	(1.4)	230.5	(52.1)	1.47	(55.6)	21	33.2	V		M				Y			
Fundamental Rule of Thumb	9.9	11.7	10.1	(10.8)	16.3	25.7	(1.8)	(11.6)	221.2	(57.0)	1.69	(57.0)	50	21.0	V									
Fisher (Philip)	9.5	5.2	1.9	(30.4)	97.3	(10.9)	22.7	(1.3)	192.4	(58.2)	2.30	(59.9)	16	32.6	V	G								
Oberweis Octagon	9.1	10.2	9.0	(35.0)	20.1	44.7	(19.1)	(5.9)	261.3	(70.6)	1.95	(71.5)	14	41.4	V	G	M							
Kirkpatrick Growth	8.9	13.2	10.4	(3.2)	7.4	12.8	(0.7)	(1.2)	193.5	(38.7)	2.08	(58.2)	13	60.7		G	M							
Cash Rich Firms	8.9	9.5	9.0	(1.3)	12.3	17.1	(7.8)	2.5	173.2	(45.6)	1.39	(45.6)	27	23.7	V								Q	
Foolish Small Cap 8	8.5	8.9	8.2	11.6	(21.0)	8.8	17.2	(19.9)	182.4	(67.7)	2.40	(67.7)	13	46.2		G	MS							

(Continued on next page)

TABLE 4

Stock Ideas on AAIL.com Ranked by 10-Year Performance (cont'd)

	Average Annual Price Gain (%)			Price Gain (%)					Price Gain (%)		Risk Measures		Holdings		Factors									
	10 Yr	Since Incep	Risk Adj	YTD	2017	2016	2015	2014	Bull Mkt*	Bear Mkt*	Volatility Index (X)	Draw-down (%)	Avg #	Turn-over (%)										
															V	G	M	S	EE	Y	Q	I	O	
O'Shaughnessy: Value	7.7	4.8	3.8	(7.5)	14.3	16.5	(12.5)	(5.8)	211.9	(69.1)	1.34	(55.3)	50	23.7	V						Y			
Lynch	7.0	9.0	8.7	(10.0)	15.7	10.3	(15.0)	(7.2)	111.2	(47.5)	1.27	(47.6)	24	21.1	V									
Kirkpatrick Bargain	5.6	6.4	5.9	(11.9)	19.4	(0.8)	(8.4)	5.9	147.8	(43.2)	1.36	(43.2)	19	63.1	V		M							
Foolish Small Cap 8 Revised	4.8	10.1	8.8	0.0	0.0	(18.3)	(2.8)	(2.1)	79.3	(64.0)	2.33	(65.1)	4	48.2	V	G	M	S				Q		
Graham—Defensive Inv (Utility)	4.8	6.8	6.8	5.7	(9.1)	13.5	(5.1)	16.0	77.2	(31.4)	1.06	(32.3)	16	14.2	V						Y	Q	I	
Insider Net Purchases	3.3	(0.9)	(9.2)	(4.0)	27.8	(3.8)	(17.9)	(11.9)	114.1	(65.5)	1.95	(70.2)	29	30.3										O
Murphy Technology	2.6	(4.9)	(27.3)	(5.9)	(34.8)	(15.0)	(15.5)	(1.3)	15.4	(58.3)	2.77	(92.4)	9	21.4	V	G						I		
Zweig	0.9	14.0	11.0	(18.9)	20.6	10.6	(5.7)	(14.6)	71.1	(54.4)	1.93	(57.0)	10	41.6	V	G						Q		
Schloss	0.3	6.6	5.5	(10.6)	3.9	(4.4)	(20.4)	(5.9)	26.7	(37.6)	2.02	(63.5)	12	55.1										
Kirkpatrick Value	(4.4)	7.3	6.7	(28.7)	29.6	2.5	(6.4)	(15.1)	10.5	(23.3)	2.23	(53.5)	3	71.6	V	G	M							
Muhlenkamp	(9.1)	(0.1)	(4.6)	(16.5)	0.4	10.7	11.2	(48.5)	(48.0)	(49.0)	1.56	(84.2)	17	23.9	V	G							Q	

	Average Annual Price Gain (%)			Price Gain (%)					Price Gain (%)		Risk Measures		Holdings		Factors									
	10 Yr	Since Incep	Risk Adj	YTD	2017	2016	2015	2014	Bull Mkt*	Bear Mkt*	Volatility Index (X)	Draw-down (%)	Avg #	Turn-over (%)										
															V	G	M	S	EE	Y	Q	I	O	
S&P 500	11.9	5.1	5.1	3.2	19.4	9.5	(0.7)	11.4	296.4	(52.6)	1.00	(52.6)												
S&P 500 Growth (w/divs)	16.0	7.3	7.3	9.4	27.4	6.9	5.5	14.9	436.5	(44.4)	1.10	(57.8)												
S&P 500 Value (w/divs)	12.4	6.4	6.4	0.6	15.4	17.4	(3.1)	12.5	331.4	(56.0)	1.00	(56.4)												
S&P MidCap 400	13.8	8.6	8.5	(1.2)	14.5	18.7	(3.7)	8.2	349.3	(50.5)	1.19	(51.0)												
S&P MidCap 400 Growth (w/divs)	16.2	11.5	10.6	1.1	19.9	14.8	2.0	7.6	434.5	(47.7)	1.29	(47.7)												
S&P MidCap 400 Value (w/divs)	14.9	8.6	8.5	(0.6)	12.3	26.5	(6.7)	12.1	402.2	(49.4)	1.12	(51.2)												
S&P SmallCap 600	14.3	8.3	8.2	2.9	11.7	24.7	(3.4)	4.4	415.6	(52.2)	1.28	(53.2)												
S&P SmallCap 600 Growth (w/divs)	17.2	10.0	9.4	8.8	14.8	22.1	2.8	3.9	547.9	(51.1)	1.32	(51.1)												
S&P SmallCap 600 Value (w/divs)	14.0	8.7	8.5	(0.4)	11.5	31.3	(6.7)	7.5	411.7	(51.0)	1.24	(53.8)												
Dow Jones 30	11.2	5.8	5.8	3.3	25.1	13.4	(2.2)	7.5	274.6	(49.3)	0.98	(49.3)												
NASDAQ 100	19.3	9.8	8.9	8.6	31.5	5.9	8.4	17.9	582.9	(50.1)	1.77	(81.5)												
All Exchange-Listed Stocks	13.7	9.2	8.8	(4.8)	15.6	17.1	(11.6)	5.0	353.2	(58.6)	1.37	(59.7)												

Factors Key

V = Value
G = Growth
M = Momentum
S = Size
EE = Earnings Estimates
Y = Yield
Q = Quality
I = Industry/Sector
O = Other

Unless otherwise stated with (w/divs), figures do not include dividends or transaction costs.

*Bull market period is March 1, 2009, through September 30, 2018. Bear market period is November 1, 2007, through February 28, 2009.

Source: AAIL's Stock Investor Pro/Thomson Reuters. Data as of 11/30/2018.

The strategy also limits passing companies to the 30 each month with the lowest price-to-free-cash-flow ratio. Even though the approach is down 12.5% year to date, it has, on average, generated an annual gain of 25.1% over the last 10 years. In comparison, the average annual price gain in the S&P 500 over the same period has been 11.9%.

We also see some of the top performers over the last 10 years with other characteristics that continue to underlie many successful stock selection strategies, namely value, growth and earnings momentum. The Price-to-Free-Cash-Flow screen is a "pure value" approach. Two of the factors that the Stock Market Winners strategy looks for are weighted relative price strength over the last year to rank in the top 30% and a current share price that is within 15% of the two-year high. The weighted relative strength measure gives greater weight to more recent relative price strength.

The Driehaus strategy focuses on small- and mid-cap

companies with a market cap of no more than \$3 billion. Driehaus is also a strong proponent of momentum investing—identifying and buying stocks in a strong upward price move and staying with them as long as the upward move continues. For him, the primary catalysts to these rapid price increases are strong positive earnings surprises, sharp upward earnings revisions and very strong, consistent and sustained earnings growth and accelerating earnings and sales.

Among the worst performers over the last 10 years, only two strategies have negative average annual price gains, down from 10 at this time last year (AAIL no longer tracks two of the 10 from last year's list). Still at the bottom of the list is the Muhlenkamp strategy, with an average annual loss of 9.1% a year over the last 10 years. This approach looks for companies with above-average returns on equity, a reasonable price-earnings ratio based on prevailing inflation and

interest rates, positive long-term earnings growth, profit margins that exceed the industry norm, a ratio of liabilities to assets that is below the industry norm and positive free cash flow. This methodology does not possess the relative valuation that we found in the top performers, as it caps the price-earnings ratio at 17, which is adjusted over time. Furthermore, it is one of the strategies that AAIL tracks that does not combine value and momentum factors. The other strategy with negative 10-year performance is Kirkpatrick Value, which has an average annual 10-year loss of 4.4%.

Risk-Adjusted Returns

Tables 2 and 4 also present the risk-adjusted return for each of the strategies that AAIL tracks. This calculation adjusts the performance of each approach using their volatility as measured through standard deviation of returns, penalizing screens with higher standard deviations (for a more detailed explanation of the risk-adjusted return calculation, see the box to the right). Using risk-adjusted returns since inception (1998), the three best-performing strategies continue to be the Stock Market Winners (16.7%), Estimate Revisions Up 5% (15.9%) and Estimate Revisions Top 30 Up (15.8%). This year's strongest AAIL stock screening strategy, the O'Shaughnessy Tiny Titans approach, ranks fourth among the methodologies AAIL tracks with an average annual risk-adjusted return of 15.3% since 1998. The median risk-adjusted return for all 59 screening strategies AAIL tracks is 9.8%.

The Estimate Revisions Up 5% strategy looks for upward revisions in annual earnings estimates; specifically, it identifies companies that have had their annual earnings estimates raised by at least 5% over the last month.

The Estimate Revisions Top 30 Up approach requires that the consensus estimates for the current fiscal year and next fiscal year have risen over the last month, that there has been at least one upward revision to the current and next fiscal-year consensus estimates, and that there have been no downward revisions in the current or next fiscal year's consensus estimates. Finally, the set of passing companies is limited to those 30 that have seen the largest percentage increase over the last month in the consensus earnings estimate for the current fiscal year.

Five of the AAIL stock screening strategies have negative average annual risk-adjusted returns. On a risk-adjusted basis, we see that the Murphy Technology approach is once again at the bottom with an average annual loss of 27.3%. This screening strategy looks for technology and telecommunications companies that have been growing sales by at least 15% a year over the last three years, as well as net margins and returns on equity (ROE) of at least 15%. Also, the Murphy Technology approach has a value filter based on the ratio of price to growth flow, which is a measure for identifying companies that are producing solid earnings

and investing a large amount in research and development (R&D). This ratio compares the current share price to the amount of per-share earnings a company generates as well as the per-share R&D expense of the company.

Bull & Bear Market Performance

Most stocks have some positive correlation with the overall market: When the market is going up, so do the values of many stocks. However, the extent of the increase varies.

When investing in individual stocks, you would like to outperform the market. Otherwise, you are probably better off investing in an index fund. By tracking the performance of our stock screening strategies over the latest bull and bear markets, you can see whether an approach outperforms the market during an uptrend or limits losses during a downtrend.

Among the AAIL stock screening strategies, the Price-to-Free-Cash-Flow approach continues to have the best bull market performance, gaining an astounding 1,153.9% between March 1, 2009, and September 30, 2018. Given the

Calculating Risk-Adjusted Return

The formula for calculating the risk-adjusted return is as follows:

$$\text{Margin Rate} + (\text{Benchmark Std Dev} \div \text{Portfolio Std Dev}) \times (\text{Portfolio Return} - \text{Margin Rate})$$

Where:

- » Margin Rate = margin rate (the rate at which you borrow funds); we currently use 7.75% for our calculations (up from 7.5% a year ago), which is the current base rate at TD Ameritrade
- » Benchmark Std Dev = standard deviation of the benchmark, in this case the S&P 500 index
- » Portfolio Std Dev = standard deviation of the portfolio of stocks passing a given stock screen
- » Portfolio Return = return of the portfolio invested in the stocks passing a given stock screen

This calculation assumes that the portfolio return for a given stock screen is higher than the margin rate. If it isn't, the risk-adjusted return calculation would be as follows:

$$\text{Margin Rate} + (\text{Portfolio Std Dev} \div \text{Benchmark Std Dev}) \times (\text{Portfolio Return} - \text{Margin Rate})$$

Following this methodology, we calculate the risk-adjusted returns since inception for all of the AAIL stock screening strategies.

recent volatility in the market, we chose not to extend the bull market period past the end of the third quarter at this time.

This year's top strategy, the O'Shaughnessy Tiny Titans, has posted a 618.2% price gain during the current bull market.

Only one of AAI's screening strategies has failed to generate a positive price gain during the current bull market: the Muhlenkamp approach is down 48.0%. By way of comparison, the S&P 500 has a bull market price gain of 296.4%.

Over the last bear market, O'Neil's CAN SLIM approach had the smallest loss at -10.1% from November 1, 2007, through February 28, 2009. The approach benefited from being out of the market for much of that time, as its strict price momentum filters have few, if any, candidates during a prolonged market downturn. When no stocks pass a strategy at the beginning of a calendar month, AAI's back-testing methodology considers the hypothetical portfolio to be fully invested in cash and out of the market. The biggest loser over the last bear market was the Dogs of the Dow Low Priced 5, which fell by 82.9%.

The O'Shaughnessy Tiny Titans strategy registered a 67.3% loss over the last bear market.

Volatility Index

The volatility index compares the variability of returns, as measured by the standard deviation of return, for a given stock screening strategy to that of a benchmark. Standard deviation is a measure of return volatility computed using monthly returns since the beginning of 1998. The volatility index is the standard deviation of a strategy's return divided by the standard deviation of return for a benchmark—in this case, the S&P 500. The volatility index provides a relative measure of risk by comparing the variation in return for a screen since the beginning of 1998 to the typical variation in return for the benchmark index. The volatility index of the S&P 500, therefore, is 1.00; methodologies with a volatility index below 1.00 are below average in risk.

All but one of AAI's stock screening strategies have volatility indexes above 1.00, which is to be expected. Stock selection strategies, after all, typically pass anywhere from a handful of stocks to around 50, while the S&P 500 is made up of 500 very heavily traded companies. As of the end of November, the only approach with a volatility index lower than 1.00 continues to be the High Relative Dividend Yield strategy. The passing company list for this screen is made up of "safer" dividend-paying stocks. Its volatility index value of 0.99 means the approach is 1% less volatile than the S&P 500 since the start of 1998. Therefore, the screen's risk-adjusted return (nearly) matches its average annual return since the start of 1998 at 8.8%.

The High Relative Dividend Yield approach requires a

rising dividend for each of the last six years, a current dividend yield that is greater than the seven-year average yield, reasonable payout ratios (depending on the industry), liabilities levels that are below industry norms and historical earnings growth that exceeds the industry norm.

The AAI stock screening strategy with the best average annual risk-adjusted return, Stock Market Winners, has a volatility index of 1.44. This indicates that, since the beginning of 1998, the monthly variability of returns for the stocks held in this portfolio has been 44% higher than that of the S&P 500. This makes the Stock Market Winners approach the 25th-riskiest screen among the 59 screens AAI tracks. Among all AAI stock screening strategies, the median volatility index value is 1.54, meaning that the typical stock screen tracked by AAI has 54% more volatile returns than the S&P 500.

The Murphy Technology approach has the highest volatility index (2.77), indicating that the monthly variability of returns for the stocks held in this portfolio is nearly twice that of the S&P 500. Accordingly, its annualized loss of 4.9% since 1998 becomes an even more dismal risk-adjusted annualized loss of 27.3%.

The O'Shaughnessy Tiny Titans strategy is tied for the 15th-highest volatility index of all the AAI methodologies at 1.93. This transforms the screen's average annual return of 22.4% since the start of 1998 to an average annual risk-adjusted return of 15.3%.

One trend that has developed over time is that the screens with a higher average number of passing companies tend to have lower volatility and, thus, a lower relative volatility index. For the five AAI stock screening strategies with the lowest volatility indexes, the historical median number of passing companies is roughly 35. However, the five approaches with the highest volatility indexes have had a median average number of passing companies of 13. For the eight strategies that, historically, have averaged fewer than 10 passing companies a month, the median volatility index is 1.94, more than 25% higher than the median volatility index for all AAI screening strategies. The median average number of monthly holdings for all AAI stock strategies is nearly 21. Furthermore, strategies with lower monthly turnover also tend to have lower volatility index values. The median average monthly portfolio turnover for the five methodologies with the lowest volatility index values is 21.4%, whereas the approaches with the five highest volatility indexes have a median average monthly turnover of 46.2%. The median average monthly turnover for all 59 AAI stock screening strategies is 33.2%.

Drawdown

The drawdown of a portfolio is the peak-to-trough decline, usually quoted as the percentage loss from the maximum value of the portfolio to the subsequent trough. As

Factor Categories of AAIL Screening Strategies

Value (V)

The foundation of value investing is the notion that cheaply priced stocks outperform more expensive stocks in the long term. Value has several dimensions: the stock price as a multiple of company earnings, price as a multiple of book value and other such ratios. Comparing a company's price-earnings (P/E) ratio to its forecasted or historical earnings growth is also used (PEG ratios). Academics and investors differ on which measure best represents a value company. The value factor has a long history in financial research starting in the 1930s when academics developed a methodology for identifying stocks trading less than their actual value. However, the best-known work on the value factor was carried out by Eugene Fama and Kenneth French in their 1992 paper, "The Cross-Section of Expected Stock Returns," which concluded that a low price-to-book ratio was the most predictive definition of value.

Screening strategies are tagged as "value" if they contain filters that look for stocks with low price multiples on either an absolute or relative basis; have price multiples that are low based on historical averages or sector/industry norms; or have price multiples that compare favorably to either historical or forecasted growth (PEG).

Growth (G)

The foundation of growth investing is the notion that stocks of companies exhibiting strong, consistent and prolonged growth outperform those of slower-growth companies. Growth has several dimensions, including year-over-year increases in sales and earnings, long(er)-term historical sales and earnings growth rates and analyst-forecasted long-term earnings growth.

Stock screening methodologies are tagged as "growth" if they look for stocks with a history of earnings increases; look for minimum levels of growth in sales, earnings, cash flow, etc.; or have minimum projected earnings growth.

Momentum (M)

The momentum factor refers to the tendency of winning stocks to continue

performing well in the near term (three to 12 months). Academics first identified the momentum premium in 1993, when Narasimhan Jegadeesh and Sheridan Titman demonstrated that the strategy of buying stocks that have done well and selling stocks that have done poorly generated significant positive returns over three- to 12-month holding periods.

Stock screening strategies are tagged as "momentum" if they look for minimum levels of absolute or relative price strength or require the share price to be within a certain percentage of the 52-week high.

Size (S)

The size factor captures the tendency of small-cap stocks to outperform bigger companies over the long run. The market capitalization of a company is its current share price multiplied by the number of outstanding shares. University of Chicago Ph.D. Rolf Banz identified the size factor in U.S. stocks in 1981. The research on size took off after economists Eugene Fama and Kenneth French included it as a key component in their influential three-factor model.

Stock screening approaches are tagged as "size" if they look for smaller companies, typically with market capitalizations below \$2 billion, or relatively small levels of annual sales.

Earnings Estimates (EE)

Investing based on analyst estimates looks for revisions in the consensus estimates as well as earnings surprises (actual earnings deviating from the consensus estimate). Academic studies have shown that companies that have seen strong upward earnings revisions or have reported significant earnings surprises can see an impact on share prices for up to a year.

Screening strategies are tagged as "earnings estimates" if they filter for the number of upward or downward revisions by analysts; the percentage change in the consensus estimate; and the percentage by which reported earnings exceeds or falls short of the consensus estimate (percentage surprise).

Yield (Y)

A yield (or high dividend yield) invest-

ment strategy gains exposure to companies that appear undervalued and have demonstrated safe, stable and increasing dividends. Dividend investing is as old as stocks themselves, playing a central role in the evolution of corporations over the centuries. Groundbreaking economists Benjamin Graham and David Dodd famously called dividend payouts "the prime purpose of a business corporation ... A successful company is one that can pay dividends regularly and presumably increase the rate as time goes on."

Screening strategies are tagged as "yield" if they specifically look for dividend-paying stocks as well as minimum absolute dividend yields or stocks that are trading with yields above historical averages or sector/industry norms.

Quality (Q)

The quality factor is described in academic literature as capturing companies with durable business models and sustainable competitive advantages. This definition has been expanded to look at company profitability and growth and quality of management. The quality factor has helped explain the movement of stocks that have low leverage, stable earnings and high profitability.

Screening methodologies that are tagged "quality" look for companies with records of consistent sales or earnings growth; strong returns on equity on either an absolute basis or relative to historical averages or sector/industry norms; and reasonable levels of debt.

Industry/Sector (I)

Sector and industry rotation is an investment strategy involving the movement of money from one industry or sector to another in an attempt to beat the market.

Screening strategies tagged as "industry/sector" explicitly isolate specific sectors or industries.

Other (O)

The miscellaneous category captures specialty screening strategies that do not fall into one of the other factor categories.

discussed, one measure of volatility is standard deviation. However, standard deviation considers both downside and upside volatility. Many investors prefer upside volatility and are concerned about drawdowns. During volatile markets, drawdown is a critical concern, especially for retirees.

Stock strategies with large drawdowns are, all else equal, not very attractive. However, how quickly the portfolio recovers from the drawdown is equally important. The Murphy Technology approach still has the largest drawdown among the 59 strategies tracked by AAI at 92.4%. The strategy lost over 92% from its peak value, in this case between May 2000 and December 2003. Being a strategy geared toward identifying technology stocks, it is probably not a surprise that this drawdown coincides with the bursting of the tech bubble. Even though it has been 179 months since the screen reached its 92.4% trough, the strategy is still down 89.5% from its 2000 peak as of November 30, 2018.

The Graham Defensive Investor Utility approach has the smallest drawdown among all AAI screens at 32.3%. This occurred between June 2007 and February 2008, during the global financial meltdown. Unlike the Murphy Technology approach, however, this strategy was able to recoup its peak-to-trough losses and achieve new highs within 40 months of its trough.

The O'Shaughnessy Tiny Titans strategy saw a maximum drawdown of 67.5%, which took 19 months to reach between August 2007 and February 2009. It then took 56 months to hit new highs.

For comparison, the median drawdown for all AAI stock screening strategies is 57.0%. The maximum drawdown for the S&P 500 is 52.6%, which transpired between November 2007 and February 2009. It took the index 49 months from that trough to achieve new highs.

Average Holdings & Turnover

The columns near the rightmost side of Tables 2 and 4 present the average number of passing stocks and the turnover percentage for each of the AAI stock screening strategies. For many of the approaches, patterns depend on the market cycle. For example, the High Relative Dividend Yield methodology has generated, on average, 35 stocks per month since the start of 1998. However, as dividend yields have fallen as the overall market value has increased, the screen has seen its average number of monthly passing companies fall such that only 19 companies have passed, on average, each month this year.

Overall, the Value on the Move PEG With Historical Growth approach has the highest average number of passing companies each month at 73. At the other end of the spectrum, the Kirkpatrick Value strategy has the lowest average number of passing companies each month at three. The median average of passing companies for the 59 AAI

screening strategies is 21.

The average monthly turnover percentage indicates the percentage of stocks passing the screen in each month that are different from the previous month. The four Estimate Revisions strategies rank in the top five for highest monthly turnovers, ranging from 89.3% to 93.3%. These approaches look for companies that have had upward or downward earnings revisions over the past month. Not many companies will continuously pass them, since that would suggest that analysts are continuously revising the estimates of a specific company upward or downward month after month.

Also, keep in mind that, as a rule, value-oriented strategies tend to have lower turnover and growth-oriented approaches tend to have higher turnover.

The AAI stock screening strategy with the lowest turnover is the Dogs of the Dow approach, with an average monthly turnover of 7.9%. This strategy looks for those 10 stocks that are part of the Dow Jones industrial average that have the highest dividend yield. Since the initial stock universe is only 30, the stocks that pass this screen month to month are relatively constant.

The median average monthly turnover for AAI's stock screening strategies is 33.2%.

Conclusion

The stock screening strategies are intended to be an educational tool to show what types of filters work over varying market conditions. They are not intended to be a buy or recommended list. At best they can be considered idea generators. You should analyze the passing stocks further before deciding whether or not to commit real dollars to them. Furthermore, since market conditions change, it is important to be adequately diversified.

One way to achieve sufficient diversification is to select stocks from multiple stock screening methodologies. However, it is not enough to simply choose those strategies that have the best long-term performance. Instead, it is useful to understand the forces influencing both the overall market and a strategy's performance, and how changing economic conditions can impact both the market and individual stocks. Examining the characteristics of an investment methodology may reveal some practical problems you might face when trying to translate quantitative stock screening into real-world portfolio building.

Something else to keep in mind is that once you decide on which methodologies to follow, you cannot just let the quantitative screens choose your stocks.

Screening is a multi-step process. For some investors, this means first applying quantitative filters such as the screens we have discussed here to help you arrive at a set of candidates that all share the same base set of characteristics. This does not necessarily mean they are all good in-

(continued on page 36)

TABLE 3

Fourth-Quarter 2018 Transactions

Sells

Company (Ticker)	Reason
AutoWeb Inc. (AUTO)	negative earnings
SigmaTron International (SGMA)	negative earnings

Buy

Company (Ticker)	Maximum Price to Pay
VSE Corp. (VSEC)	\$32.37

Sold: SigmaTron International (SGMA)

SigmaTron International was on earnings probation since it announced its fourth-quarter 2018 earnings on July 20. With the fourth-quarter results, the company's trailing 12-month adjusted earnings fell to a loss of \$0.64 per share, placing it on earnings probation. The company announced a first-quarter 2019 loss of \$0.85 per share on September 12. If a Shadow Stock that is on earnings probation reports a subsequent quarterly loss, it is removed from the portfolio.

Purchased: VSE Corp. (VSEC)

With the market pullback, a greater number of stocks has been passing the value and size filters for the Model Shadow Stock Portfolio. As of the end of November, 25 stocks met the initial selection criteria, but the portfolio already held nine of them. Applying liquidity requirements to the remaining stocks reduced the number to four candidates. After ranking the four by their four-week relative strength, our additional analysis found that the top option had significant trust and partnership interests. Another potential selection had a significant joint-venture in China; companies whose primary business is in China are not purchased for the Model Shadow Stock Portfolio.

This led to VSE Corp. being purchased for the portfolio. VSE Corp. is a services and supply chain management company to the U.S. Department of Defense (DOD), the U.S. Postal Service (USPS), federal civilian agencies and commercial and other customers. The company's service offerings include supply chain and inventory management

services; vehicle fleet sustainment programs; vehicle fleet parts supply and distribution; maintenance, repair and operations (MRO) of aircraft engines and engine components; aircraft engine parts supply and distribution; engineering support for military vehicles; military equipment refurbishment and modification and ship MRO and follow-on technical support.

Based on VSE Corp.'s closing price of \$29.13 on November 30, we suggest paying no more than \$32.37, which provides a 10%

cushion given that its price-to-book-value ratio was very close to the 1.0 cutoff for the Model Shadow Stock Portfolio. To calculate the maximum buy price based on the price-to-book-value ratio, multiply the current share price by the ratio of the maximum price-to-book ratio to be considered for the Model Shadow Stock Portfolio (currently 1.0) to the current price-to-book ratio of the stock. The price-to-book ratio for VSE Corp. as of November 30 was 0.99, so the calculation, including the 10% cushion, is: $[\$29.13 \times (1.0 \div 0.99)] \times 1.1 = \32.37 .

Follow the Portfolio Online

The next portfolio review will take place at the end of February, and any changes made then will be reported in the April 2019 AAIL Journal. You can keep abreast of the Model Shadow Stock Portfolio on AAIL.com in the Model Portfolios area. To receive monthly email updates along with alerts to any changes made to the portfolio, please sign in to AAIL.com and go to www.aail.com/email.

Q JOIN THE CONVERSATION ONLINE

Visit AAIL.com/journal to comment on this article.

➤ MORE AT AAIL.COM/JOURNAL

Model Shadow Stock Portfolio: Staying Invested All 12 Months, by John Bajkowski, May 2018

The Cost of Panicking, by AAIL Staff, March 2018

How Much Small Cap Should Be in Your Portfolio?, by John McDermott, Ph.D. and Dana D'Auria, CFA, July 2014

AAIL STOCK IDEAS (CONTINUED FROM PAGE 27)

vestments. It is important then to perform at least cursory qualitative analysis to decide whether they are right for your stock portfolio.

Q JOIN THE CONVERSATION ONLINE

Visit AAIL.com/journal to comment on this article.

➤ MORE AT AAIL.COM/JOURNAL

"What Works": Key New Findings on Stock Selection, by James O'Shaughnessy, October 2013

Micro-Cap Stocks Are Less Widely Followed, Offer Benefits, an interview with Michael Corbett, June 2016

Five Common Traits of Successful Value Screens, by John Bajkowski, July 2014