



### Creating 13F-based strategies with WhaleWisdom's Backtester

David Tepper may be THE best performing hedge fund manager ever. According to Forbes, over the last 23 years Tepper's hedge fund <u>Appaloosa Management</u> has averaged 30% annualized net returns. Assuming the fund has charged 2% management and 20% performance fees, Tepper's annualized returns before fees could be in the neighborhood of 40%.

Tepper's Appaloosa Management would therefore seem like a great fund to replicate using <u>13F</u> <u>filings --</u> SEC mandated quarterly disclosures of large funds' positions. Tepper has demonstrated masterful stock-picking skills for many years, so it's reasonable to assume he'll continue to build wealth for his investors going forward.

If one can clone the Appaloosa's fund using 13Fs, then an investor can piggyback on Tepper's ideas without paying the 2 and 20 fees direct investors in his fund are subjected to.

Replicating Tepper's positions seems straightforward enough: When Appaloosa updates its holdings via 13Fs -- 45 days after the close of every quarter -- one uses WhaleWisdom to view the changes and rebalance the clone portfolio accordingly.



Sounds great, let's fund an account and begin replicating Appaloosa's positions.

Hold on though. A reasonable question to ask is: Would cloning Tepper's trades using 13F holdings actually be a profitable strategy? Sure, Tepper is an investing legend with an amazing two-decade track record, but does mimicking Appaloosa's 13Fs accurately capture the performance of his fund?

One problem might be the lag of 13F filings. 13Fs are required to be disclosed 45 days after a quarter's end. It's possible an investor replicating Tepper's buys and sells is acting on stale information.

Also, 13F filings do not necessarily reflect all the holdings of a fund. Stocks and equity-related securities must be disclosed; however, short positions, fixed-income, commodities, and other securities do not appear in 13F filings. Replicating 13Fs may not capture Tepper's complete strategy.

So, what evidence is there that cloning Appaloosa's 13Fs will be profitable? Well, the best way to predict how a 13F-based strategy might work in the future is to see how it would have worked in the past. For this we use a uniquely powerful tool: The Backtester.

## WhaleWisdom's Backtester enables an investor to analyze the 13F filing history of over 4,200 funds dating back to 2001. By backtesting possible strategies, one can determine the most profitable managers to clone.

What is backtesting? It's the use of historical data to construct a trading strategy and determine if it would have been profitable in the past. By analyzing how a hypothetical strategy would have performed historically, an investor can devise a trading process with the best chance of success going forward.

WhaleWisdom's backtesting feature enables an investor to create 13F-based strategies that are optimized for profit, and customized for the investor's unique expertise, interests and risk tolerance.

Analyzing and backtesting strategies not only uncovers profitable approaches, but also helps develop the confidence vital to sticking with a chosen strategy.

# We all have behavioral biases that can sabotage our investing -- we are hardwired to be fearful when we should be bold, and bold when we should be fearful. Backtesting helps us create rules-based strategies that remove unprofitable emotion-driven decisions from investing.

Backtesting not only confirms past profitability, but also highlights the volatility and drawdowns to expect from a strategy. For instance, a profitable strategy that regularly draws equity down by 50% may be impossible to stick with; a modestly profitable strategy with small drawdowns may benefit from larger positions.

WhaleWisdom's backtesting feature allows a subscriber to test and optimize the core components of a 13F-based strategy. Here's a few of the questions the Backtester can answer:

• Which managers are most profitable to clone using 13Fs?

- Is it necessary to replicate all of a fund's holdings? Or is mimicking the most concentrated positions best?
- How has a manager performed over various time periods? Was the fund's best performance years ago? Has the manager been beating the market recently?
- How volatile has a fund's performance been historically? Would the drawdowns of a hypothetical 13F strategy be extreme?

Let's run a basic backtest for Appaloosa to see if replicating Tepper's 13F filings would have been profitable.

From WhaleWisdom's home page at the top left in "fund/stock lookup" enter "Appaloosa". Click on "filer: Appaloosa". You'll see statistics and graphs for Appaloosa. Scroll down and in the Backtester section choose "Generate Report."



The chart shows that since 2001, if you had replicated Tepper's Appaloosa Fund's 13F filings, your total return would have been 1,241% (light green). Over the same time period the S&P 500's total return was 152% (dark green).

Below the chart are the current holdings of this hypothetical strategy as of the most recent 13F filing for Appaloosa. Note that there are 10 holdings and each one is 10% of the portfolio. This is the default setting for the Backtester. For this backtest, WhaleWisdom has taken the top 10 holdings of the fund by percentage and created an equal-weight portfolio. The Backtester then rebalanced 46 days after each quarter's end, the day after the new 13F was released.

Current Holdings Rebalanced on 2017-02-15 Click the "Download Backtest Data to Excel" link above to see all stock activity

Stock prices used are the "total returns" stock price and will include dividends, spinoffs, splits, and other adjust match a stock's actual closing stock price on the same date.

Stock Name	% of Portfolio	Avg Price Per Share (total returns price)	Total Return as of 2017-03-10	Original Purchase Date
AGN Allergan PLC (Formerly Actavis PLC)	10.00	\$241.01	0.86%	2016-08-15
ETP Energy Transfer Partners LP	10.00	\$184.61	40.41%	2016-02-16
GOOG ALPHABET INC CAP STK CL C	10.00	\$699.93	20.81%	2016-02-16
WPZ Williams Partners L.P.	10.00	\$47.08	34.79%	2016-05-16
FB Facebook Inc	10.00	\$117.20	18.86%	2016-11-15
PNC PNC Financial Services Group, Inc. (The)	10.00	\$203.47	-1.02%	2017-02-15
ALL Allstate Corp.	10.00	\$95.21	30.34%	2016-02-16
TEVA Teva Pharmaceutical Industries Ltd, ADR	10.00	\$187.40	-8.32%	2017-02-15
PFE Pfizer, Inc.	10.00	\$58.73	1.80%	2017-02-15
OC Owens Corning Inc (New)	10.00	\$48.14	34.47%	2015-11-16

By the way, prices used in backtests are the "total returns" price. The total returns include dividends, spinoffs, and other adjustments, which can be significant contributors to performance. So, if a stock price in the Backtester doesn't match a recent quote, it's likely reflecting a total return price.

We can conduct a variation on the above backtest by cloning Tepper's top ten holdings, but rather than equal-weighting the positions at 10% each, we'll weight them based on the manager's actual holdings. For instance, in the most recent 13F, AGN was 27.90% of Appaloosa's top ten holdings, so that stock would receive a 27.90% allocation in the portfolio when rebalanced.

To change the default settings and run this backtest, just below "Backtester" click on "Backtest options". Now select "Combined Percent of Portfolio". Further down, under "How do you want available funds allocated among stocks?" Choose "Balance portfolio on basis of aggregate stock weightings". Now click "Generate Report".

 Backtester
 GENERATE REPORT

 Use WhaleWisdom's Backtester tool to test how a hypothetical potholic would have performed with different investment strategies. Research one or more filers' performance and then optimize their portfolios to match your own investment goals.
 GENERATE REPORT

 Backtest options
 Optional Stock Filters v
 Optional Hedging/Advanced v



The hypothetical performance of this backtest is 1,062.98% -- stellar, but slightly less than the backtest using equal-weightings of Appaloosa's top ten holdings.

The Backtester offers many ways to rebalance a cloned portfolio: We can run a backtest based on Tepper's top five holdings using his fund's actual concentrations. That test shows a return of 842%. What about top 5 holdings equal-weighted? Change to "Balance portfolio by equally weighting stocks" and choose "5" as the number of holdings to use. That return is 1,017% since 2001.

By backtesting a variety of rebalancing options with WhaleWisdom's Backtester, an investor can zero-in on the optimum parameters for running a profitable cloned fund. Note that at the top of the backtest chart is an option to "Download Backtest Data to Excel". Performance stats are available for your own custom analysis, along with the actual rebalancing transactions used in the historical tests.

So now that we've backtested rebalancing options, and decided on the best rebalancing parameters, we're ready to begin replicating Tepper's Appaloosa hedge fund in our brokerage account with real money. No, no yet. There are other considerations.

Std Dev Sortino 1Y 3Y 5Y 7Y 10Y YTD 2Y Total Return Annualized 114.06% Whale(s) 7.005% 15.04% 19.15% 34.02% 131.42% 199.05% 1,239.52% 17.707% 27.472% 1.025 S&P 500 Total Return Index 6.418% 17.11% 18.52% 33.90% 88.51% 131.48% 98.18% 153.422% 6.016% 14.390% 0.430

On the initial backtest above, here are the returns shown for various time periods.

Look carefully at the "Whale(s)" returns vs the S&P 500 Total Return Index. Notice that over YTD, 1Y, 2Y and 3Y returns, Tepper's Appaloosa fund has just barely kept pace with the S&P. Above the chart click "3y" to display Tepper's returns over the last three years vs the S&P.



This is an eye opener. Over the last several years the S&P 500 Total Return Index would have slightly outperformed the 13F transactions of Appaloosa. Assuming the 13F returns are representative of Tepper's actual hedge fund performance (comparison with actual fund returns confirms this), Appaloosa's recent performance has been just average. This isn't too surprising. All of the great managers -- Tepper, Warren Buffett, George Soros, etc.-- have tended to experience their best years when their funds were much smaller.

Fact is, running \$5, \$10 billion or more is a lot different than managing \$200 million. Small whales are a lot more nimble than big whales. Managers running smaller funds can trade in and out of positions without substantially moving the price of the stock they're accumulating. Smaller funds can put all of their assets into their best ideas. However, as a fund gets large, its forced to spread its money over more positions. The larger a fund gets, the more likely it is to correlate with the overall market.

So, if we're truly interested in replicating the best ideas of the best managers, there may be better options than cloning Tepper's Appaloosa.

Rather than choosing managers to replicate based on reputation, possibly a better approach is to examine the hypothetical 13F performance of all managers and develop strategies based on the top performing managers in recent years. We know the last several years have been difficult for many funds, with most underperforming the S&P 500. Possibly we should analyze the managers who have excelled in this environment, and develop a clone of their funds. WhaleWisdom makes this easy.

One of the most intriguing ways to use WhaleWisdom is to create a "fund of funds" that replicates the top 13F holdings of a customized group of elite managers. Using WhaleWisdom,

we can narrow down the 4,200+ funds that have 13Fs and select a handful that have shown great performance based on our customized criteria. Then, every quarter when 13F filings are released, we can rebalance the fund of funds to hold the highest conviction picks of this group of elite managers.

Let's create a fund of funds of the most exceptional funds over the last three years.

Select "13F" from the top of the page. Choose "13F Fund Performance Search". You'll see page one of 171. These are all the 4,269 funds in the Whale Wisdom data base.

13F Fund Performance Search Fund performance numbers are based on backtested data taken 3-5 days after the most recent 13F filing deadline. backtests use the fund's top 20 holdings:											
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Is hedge fun	d? 👻 QoQ Turnor	ver 🖌 Top	o 10 Holdings %	of Total 👻	# of Holdings	✓ 13F MV	V Perf	ormance QoQ	- 1-Year P	erf 🖌 5-Y	ear Perf 👻
Cumulative I	Perf v Sector Co	ncentration 👻	WhaleSco	re Equal Weight	1-Yr Avg. 👻	WhaleScore	Mgr Weight 1-	Yr Avg. 👻	Avg Time in To	p10 ~	
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	HIGHLANDER				40.000	15.000		100.555	0.550		0.001.000
99	MANAGEMENT, LLC	Micro	662	\$ 115,243,000	13.29%	15.61%	4.28%	128.55%	3.55%	109.38%	3/31/20
98	VGI PARTNERS PTY LTD	Small	10	\$ 396,740,992	40.00%	100.00%	1.01%	130.28%	3.66%	119.60%	3/31/20
98	DORSAL CAPITAL MANAGEMENT, LLC	Small	28	S 1,593,021,950	50.00%	60.86%	4.58%	136.51%	5.90%	129.04%	12/31/2
98	ALTIMETER CAPITAL MANAGEMENT, LP	Small	17	S 1,949,762,050	47.06%	94.60%	1.55%	250.79%	0.46%	253.95%	12/31/2
98	SACHEM HEAD CAPITAL MANAGEMENT LP	Mid	13	\$ 2,614,139,900	115.38%	90.27%	22.66%	61.04%	14.97%	65.81%	12/31/2
97	DECATUR CAPITAL MANAGEMENT, INC.	Small	101	\$ 696,091,010	52.48%	25.44%	4.61%	188.11%	4.87%	175.15%	9/30/20
97	TECHNOLOGY CROSSOVER MANAGEMENT VII, LTD.	Mid	7	S 2,166,716,930	0.00%	100.00%	10.33%	231.06%	5.77%	172.77%	12/31/2
97	ELIZABETH PARK CAPITAL ADVISORS, LTD.	Micro	47	\$ 235,054,000	29.79%	48.77%	7.89%	65.76%	7.24%	60.42%	12/31/2
96	GREENHAVEN ASSOCIATES INC	Mid	24	\$ 5,928,362,000	8.33%	88.59%	5.32%	1,008.49%	4.34%	649.05%	3/31/20
96	PAR CAPITAL MANAGEMENT INC	Mid	75	\$ 7 649 246 200	24.00%	59.47%	4.23%	923.67%	3.33%	905.69%	3/31/20
95	ADIRONDACK RESEARCH & MANAGEMENT INC.	Small	107	\$ 294,420,000	15.89%	25.06%	2.93%	116.30%	3.16%	120.23%	12/31/2
94	SLATE PATH CAPITAL	Mid	15	\$ 2 280 240 120	60.00%	91.57%	2.17%	110.20%	7.68%	112.69%	12/31/2
94	FJ CAPITAL MANAGEMENT // C	Small	80	\$ 673,436,030	21.25%	47.23%	12.20%	78.14%	11.52%	76.22%	12/31/2
94	WHALE ROCK CAPITAL MANAGEMENT LLC	Small	30	\$ 1,238,685,060	46.67%	58.10%	7.09%	289.06%	7.30%	277.86%	12/31/2
94	JOHO CAPITAL LLC	Small	8	\$ 498,015,008	37.50%	100.00%	6.12%	494.14%	9.65%	1,313.06%	3/31/20
94	TEKLA CAPITAL MANAGEMENT I I C	Mid	143	\$ 2.347,508,990	18.88%	44.73%	5.74%	310.08%	4.17%	312.52%	6/30/20
92	PATRIOT FINANCIAL	Small	11	\$ 302,312,000	36.36%	98.53%	10.36%	210.35%	10.18%	209.79%	12/31/2
92	LEUCADIA NATIONAL	Small	22	\$ 927,097,020	195.45%	96.69%	2.30%	635.75%	6.92%	286.32%	12/31/2
91	OKUMUS FUND	Small	10	\$ 429,180,000	20.00%	100.00%	-3.50%	147.55%	5.05%	192.57%	12/31/2
91	MANAGEMENT LTD.	Mid	33	S	12.12%	38.77%	4.66%	161.94%	5.14%	169.20%	12/31/2
	MANAGEMENT LP BOGLE INVESTMENT	Small	222	5,608,742,900 S	01.61%	12.00%	2.26%	617.69%	2.26%	621 22%	2/21/20
	MANAGEMENT L P SCGE MANAGEMENT	ornali	322	1,449,463,040	21.014	12.094	2.30%	017.00%	2.30%	V21.32/0	3/31/20
91	L.P.	Small	12	s 299,977,984	58.33%	95.20%	0.26%	118.00%	0.08%	59.02%	12/31/2
91	MANAGEMENT LP	Small	26	1,361,752,060	80.77%	60.31%	2.98%	277.70%	2.59%	259.68%	12/31/2
90	CASTLE CREEK CAPITAL PARTNERS	Micro	6	\$ 103,630,000	33.33%	100.00%	6.49%	Receive Free	Quarterly 13	- Analysis	1241/2

Clicking on the heading at the top of each column will sort the list based on that criteria. The farleft column is "WhaleScore 1 Yr. Equal-Wt.". Click on it until funds with WhaleScores in descending order are shown.

### The <u>WhaleScore Rating</u> allows investors to quickly identify funds whose 13F filings have consistently beaten the market. Essentially, WhaleScore rates funds based on three-year 13F returns, taking into consideration volatility and other risk measures.

WhaleWisdom generates two variations of each filer's WhaleScore using the top 20 securities in that filer's portfolio: one that "Equal-Weights" the 20 securities and one that "Matches the Manager" to reflect the manager's actual allocation. WhaleScores are updated quarterly. Any fund not considered a bank, insurance company, trust, or pension that has between 5 and 750 holdings, at least 3 years history, and at least 20% of their portfolio concentrated in their top 10 holdings are included in the WhaleScore calculation.

On the 13F Fund Performance Search, viewing all funds sorted by descending WhaleScore, we see Highlander Capital Management is at the top of the list. Highlander is a small fund with holdings just over the minimum \$100 million Market Value (MV) for a 13F filer. Note that Highland is focused on micro caps and that it has over 600 holdings.

Our goal is to narrow down the universe of 13F filing funds to a small portfolio of the very best performing funds. First, click on "WhaleScore Equal Weight 1-Yr Avg." and choose "90" to "99".

For the purposes of creating our fund-of-funds, let's select for managers who have high conviction in their top holdings. We'll choose funds that have relatively concentrated portfolios. In the menu just above "Search Results" click on "Top 10 Holdings % of Total". Enter from 50 to 100 and click "Add". This means that we're selecting for managers that hold 50% or more of their 13F assets in their top 10 positions.

We now have 18 funds with concentrated portfolios and very high WhaleScores.

90 to 99	× 50 to 100	×									
Search Resu	lts										0
WhaleScore 1 Yr Equal-Wt	Filer	Fund Size	Holdings	gs MV ♣	Turnover	% in Top 10	Perf. Eql. Wt.		Perf. Mgr. Wt.		Earliest 13F
90	CASTLE CREEK CAPITAL PARTNERS IV, LP	Micro	6	\$ 103,630,000	33.33%	100.00%	6.49%	108.33%	7.13%	73.72%	12/31/2012
91	SCGE MANAGEMENT, L.P.	Small	12	\$ 299,977,984	58.33%	95.20%	6.26%	118.00%	6.68%	59.02%	12/31/2011
92	PATRIOT FINANCIAL PARTNERS GP, LP	Small	11	\$ 302,312,000	36.36%	98.53%	10.36%	210.35%	10.18%	209.79%	12/31/2011
98	VGI PARTNERS PTY LTD	Small	10	\$ 396,740,992	40.00%	100.00%	1.01%	130.28%	3.66%	119.60%	3/31/2013
91	OKUMUS FUND MANAGEMENT LTD.	Small	10	\$ 429,180,000	20.00%	100.00%	-3.50%	147.55%	5.05%	192.57%	12/31/2010
94	JOHO CAPITAL LLC	Small	8	\$ 498,015,008	37.50%	100.00%	6.12%	494.14%	9.65%	1,313.06%	3/31/2001
92	LEUCADIA NATIONAL CORP	Small	22	\$ 927,097,020	195.45%	96.69%	2.30%	635.75%	6.92%	286.32%	12/31/2004
94	WHALE ROCK CAPITAL MANAGEMENT LLC	Small	30	\$ 1,238,685,060	46.67%	58.10%	7.09%	289.06%	7.30%	277.86%	12/31/2006
91	CONATUS CAPITAL MANAGEMENT LP	Small	26	\$ 1,361,752,060	80.77%	60.31%	2.98%	277.70%	2.59%	259.68%	12/31/2008
98	DORSAL CAPITAL MANAGEMENT, LLC	Small	28	\$ 1,593,021,950	50.00%	60.86%	4.58%	136.51%	5.90%	129.04%	12/31/2011
90	CAMBER CAPITAL MANAGEMENT LLC	Small	37	\$ 1,920,377,980	48.65%	55.64%	1.17%	241.74%	-0.58%	216.94%	12/31/2009
98	ALTIMETER CAPITAL MANAGEMENT, LP	Small	17	\$ 1,949,762,050	47.06%	94.60%	1.55%	250.79%	0.46%	253.95%	12/31/2011
90	LINDSELL TRAIN LTD	Mid	11	\$ 2,035,584,000	0.00%	99.05%	5.71%	211.07%	6.49%	215.40%	12/31/2009
97	TECHNOLOGY CROSSOVER MANAGEMENT VII, LTD.	Mid	7	\$ 2,166,716,930	0.00%	100.00%	10.33%	231.06%	5.77%	172.77%	12/31/2011
98	SACHEM HEAD CAPITAL MANAGEMENT LP	Mid	13	\$ 2,614,139,900	115.38%	90.27%	22.66%	61.04%	14.97%	65.81%	12/31/2013
94	SLATE PATH CAPITAL LP	Mid	15	\$ 3,289,349,120	60.00%	91.57%	2.17%	110.20%	7.68%	112.69%	12/31/2012
96	GREENHAVEN ASSOCIATES INC	Mid	24	\$ 5,928,362,000	8.33%	88.59%	5.32%	1,008.49%	4.34%	649.05%	3/31/2001
96	PAR CAPITAL MANAGEMENT INC	Mid	75	\$ 7,649,246,200	24.00%	59.47%	4.23%	923.67%	3.33%	905.69%	3/31/2001

Sorting by the "MV" (Market Value) column we see that the funds range from small to large --Castle Creek Capital Partners has a 13F market value (MV) of \$103 million, and at the other extreme, Par Capital has a MV of \$7.6 billion.

In the top right, click "Create Filer Group from Results". Let's call this group of funds "Elite Funds".

Now return to the Backtester. Choose "One of your custom groups". Select our custom group "Elite Funds". Then in the top right "Generate Report".

The default "Max" chart shows an impressive 4,829% hypothetical return since 2001. Now click on "3y" and we see that since the 1st quarter of 2014, our Elite fund of funds group has nearly tripled the S&P 500 Total Return Index -- 104.69% to 36.12%.



Selecting "Backtest options" shows the default setting for determining rebalancing: Absolute Count and 10 holdings.

Absolute Count selects securities for our fund of funds based on stocks that are held by multiple managers. In other words, we create a portfolio of stocks that more than one of our 18 Elite managers likes. The top ten securities with the most overlapping ownership among our managers are selected to comprise the portfolio. 46 days (a configurable option) after the end of every quarter, the day after the filing deadline, WhaleWisdom rebalances to include a new top ten in the fund of funds.

Returning to the Backtest menu, choose "Combined Percent of Portfolio". This will select ten securities from our 18 managers based on the highest % holdings of each fund. The hypothetical performance of this backtest is not quite as good, but still excellent.

There are many other filters a WhaleWisdom subscriber can use when Backtesting including:

- Selecting stocks based on dollar value, new purchases, or combined % of portfolio with custom weight for each individual fund
- Rather than equal-weightings, fund of fund weightings can be based on the managers own relative weightings
- The number of holdings held in a backtest can vary: 1 through 50 positions can be tested.

- The kinds of stocks held in a fund of funds portfolio can be restricted by numerous categories, including: Market Cap, Sector, price, etc.
- There are also hedging strategies available using the S&P 500 short ETF. When backtesting, moving averages that trigger the hedge can be configured.

Obviously, there is no guarantee that managers and funds selected for 13F replication by WhaleWisdom's Backtester will be profitable in the future. However, by familiarizing yourself with the Backtester's tools, and spending time analyzing historical 13Fs, one can gain valuable insight into how a manager achieved his performance in the past.

The more knowledge one has about fund managers' historical portfolio activity, the better one's chances of profiting from 13F-based strategies going forward.

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