

Bloomberg Activism Screening Model

Identifying potential activism targets.

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Bloomberg Activism Screening Model

This white paper investigates the results of the Bloomberg Activism Screening Model. The model's goal is to answer a basic question: Which companies in a list of equities may become targets for activist investors? This model has been requested frequently by Bloomberg clients. Advisers to activists and targets as well as internal experts recommended the screening criteria.

The model selected 17 factors from a pool of 60 candidate factors. These factors fall into 5 categories: Returns (5), Valuation (4), Ownership (3), Governance (3) and Operations (2). Some factors are based on market data, including returns over 6 months, 1, 2, 3 and 5 years. Some are derived, including price/earnings ratio relative to peers and margins relative to peers. Others are compiled by Bloomberg, including CEO tenure and whether the company has dual-class unequal voting rights. Each criterion, scaled from 0 to 100, is applied to all the companies in a list (for this investigation, the Russell 3000 Index was used). Companies are ranked by the outcomes, with those higher on the list considered more likely to draw the interest of activists.

The examination looked at four years of data and found that, on an out-of-sample basis, 20% of companies in the top one percent of the ranking may face activist campaigns in the next 12 months. The average base rate for the entire Russell 3000 is 4.5%.

The results of the screening may differ for lists outside the Russell 3000. The criteria are available to Bloomberg clients in the (EQS<GO>) Equity Screening function under Popular Screens, which allows clients to save the screen and change the criteria.

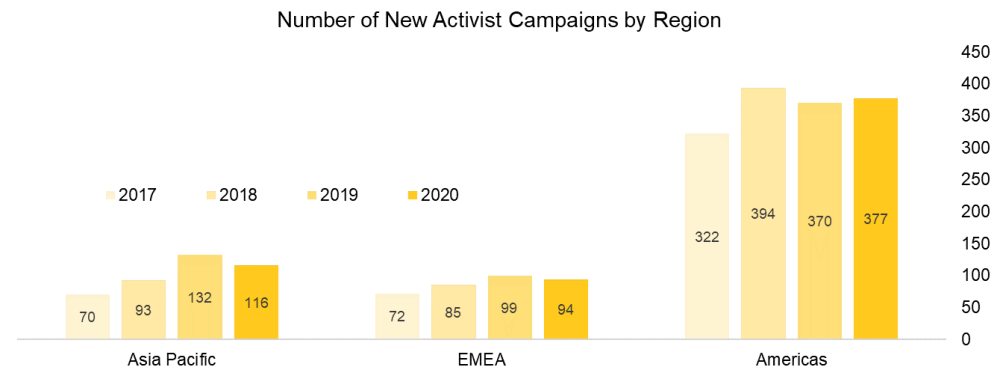
Abstract

In this paper, we propose a combination of factors that may be used to anticipate activist campaigns. Results demonstrate that it is possible to order companies by their likelihood of facing campaigns using data points on returns, valuation, operations, governance and ownership.

The study is conducted by collecting a list of 60 factors we expect should correlate to activist targets. We determine out-of-sample values by finding the best-performing factor combinations for 80% of our 2017-2020 dataset and testing those combinations on the remaining 20%. Finally, we use this data to produce a ranking that clients can access in EQS <GO>.

Introduction

As activist campaigns developed from a rarity to an asset class, the need for robust data has grown. Bloomberg launched its global activism database (BI ACT <GO>) in 2019. In January 2021, Bloomberg released the Bloomberg Activism Screening Model, which ranks potential activist targets. Globally, there were 587 campaigns announced in 2020, down from 2019's 601 but up from 572 in 2018.¹



The market views activists as catalysts for positive change. Stock prices of target companies typically increase the day of a campaign announcement. The average one-day return of companies targeted from 2017-2020 was 2.3%; the bump was 3.3% for investors considered "Core Activists" by Bloomberg.

¹ BI ACT <GO> defines an activist campaign as any situation where a shareholder is publicly seeking to influence a company without management support. Sources are typically press releases, regulatory filings or media reports. The database also tracks significant ownership stakes held by investors whose core focus is activism, even if the investor has not made any public demands. We also include activist-like actions of unsolicited bidders taking toehold stakes in targets, as well as hostile bids. Environmental/social-focused campaigns by small shareholders are not included in the dataset; we only include campaigns by economic activists (though we do include a small number of environmental/social-focused campaigns by major economic activists, such as those by TCI Fund Management).

Training and testing the model

The goal of the Bloomberg Activism Screening Model is to rank companies based on their likelihood of becoming activist targets by using datasets available through Bloomberg's standard API.

To optimize our rankings, we trained the model on activist campaigns in the Russell 3000 announced from 2017-2020. We exclude companies that already face activist campaigns, which reduces our list to about 2,700-2,800 companies.² On average, 4.5% of such Russell 3000 companies are targeted by activist campaigns over the following 12 months (approximately 120 companies).

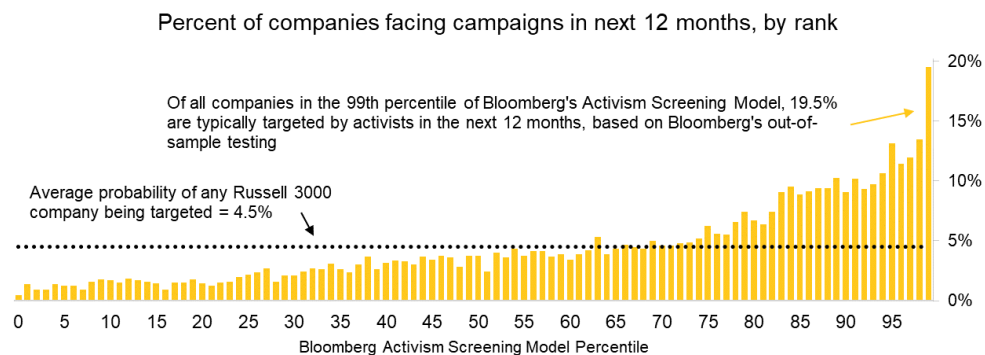
We determined the optimal combination of factors by testing the performance of thousands of possible equally weighted combinations of the 60 factors to determine which most accurately anticipated future campaigns.

We performed each test using company data from four point-in-time reference dates: year-end dates from 2016 to 2019. We then combined the data from the four years into a single table of 11,000 rows, representing companies at a given point in time; and 60 columns, representing data points for each company and date. We shuffled this table 100 times and created 100 pairs of training sets (80% of the table) and testing sets (remaining 20% of the table).

We can determine expected out-of-sample (go-forward) precision by observing average out-of-sample results of the best in-sample combination for each of our 100 random shuffles.³

Results

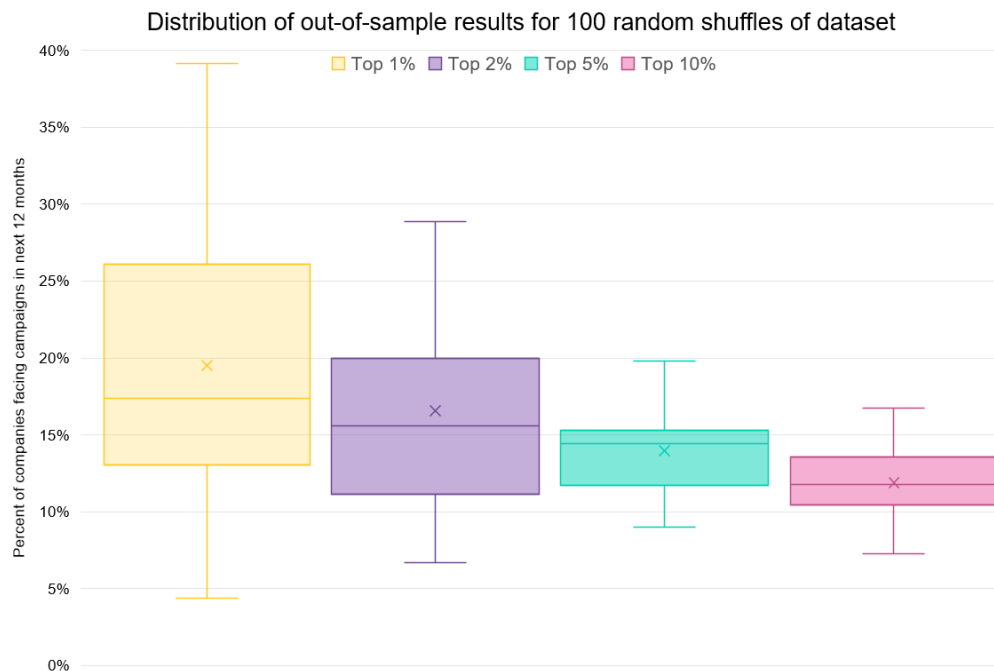
We found that in out-of-sample testing, 19.5% of the companies ranked in the top one percent are targeted by activists in the following 12 months – or 4.3x the base rate of 4.5%.



² We also exclude from our training set campaigns that began with opposition to an announced merger as these deals are often take-privates with high insider ownership at companies that an activist would not normally target.

³ That is to say, for the first random shuffle of our table, we can test thousands of combinations of our 60 factors on the 80% training set. Assume the best-performing combination was a specific 20-factor model. How does that model do on the 20% testing set? Repeat the entire process for all other shuffles, so the same combination is rarely used twice. What is the average out-of-sample result for all 100 random shuffles?

Below is the distribution of out-of-sample hit rates within the top 1%, 2%, 5% and 10% of the rankings created in the 100 shuffles. In this chart, the box highlights the middle two quartiles, with a line for the median and marker for the mean. The “whiskers” extend up to the highest and lowest points excluding outliers, following the Tukey industry standard, which defines values as outliers if they are more than 1.5 times the length of the box from either end of the box.



Factors

We started with 60 factors based on suggestions from internal and external experts. The tests allowed us to remove many because they showed little correlation with activist activity or didn’t enhance the results of the study. We were left with the 17 that most effectively anticipated campaigns.

Most factors are normalized by percentile ranking against the full Russell 3000 universe or industry peer group, where a score of 100 indicates the highest expected likelihood of being targeted by an activist and 0 indicates the lowest. Some factors were binary, for example, whether a company has unequal voting share classes: 100 if not, 0 if so.

To get to that list of 17, we didn’t pick only the best-performing possible combination, which would risk an overfit list of factors. Instead, we looked at which factors most frequently appeared in the list of top combinations and excluded factors that rarely showed up in that list. We excluded factors until we determined further reductions did not improve results. We considered the value of factors/combinations to the top 1%, 2%, 5% and 10% hit rates, as well as the average percentile rank of activist targets in each combination.

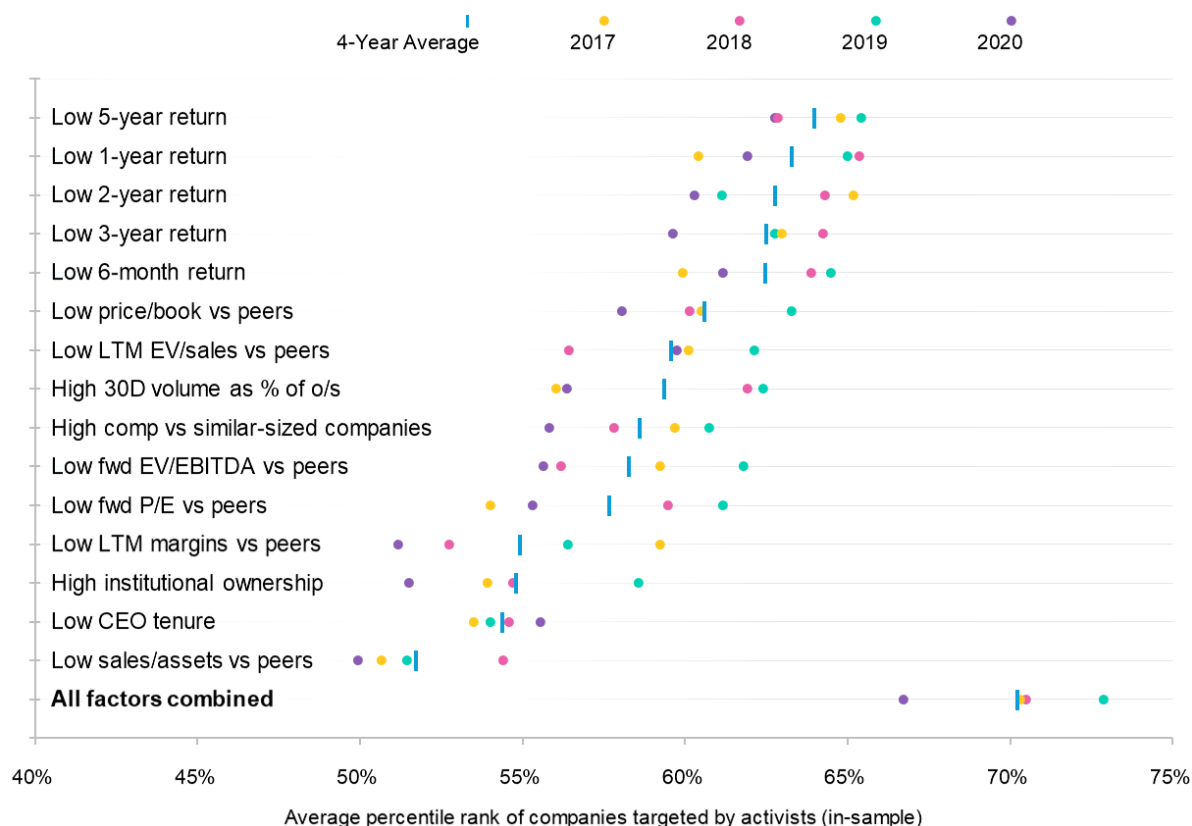
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All factors are evenly weighted. While weighting factors improved in-sample hit rates, out-of-sample hit rates did not – suggesting weightings allowed overfitting.

The 17 factors are shown below. Missing data is scored as 50th percentile unless otherwise noted. When factors are created from ranking against industry peers, BICS (Bloomberg Industry Classification System) Level 3 industries are used. If a company is the only member of its industry in the universe (Russell 3000), then BICS Level 2 industry groups are used.

Category	Factor	Scoring	Reason
Governance	No unequal voting share classes	Binary: 0 if unequal voting, 100 if not	Dual-class voting rights usually make it impossible for an activist to win a proxy fight
	High compensation	Percentile rank vs. similar market caps. Split universe into 10 bins by market cap. Compare within each bin	High compensation may attract activist criticism
	Low CEO tenure	Percentile rank vs. industry peers	CEO turnover may indicate dissatisfaction with the company; activists may find new CEOs less protected by boards
Operations	Low LTM EBITDA/operating margins	Percentile rank vs. industry peers. Use EBITDA margin when available; otherwise compare with operating margins. If EBITDA margin < -100 or is blank, treat as if it were a very high number	Low margins indicate possibility for increased profitability. However, extremely negative margins more often indicate a pre-revenue company, which activists rarely target
	Low sales-to-assets (last FY)	Percentile rank vs. industry peers	Sales leverage is a measure of how efficiently companies use assets
Ownership	High institutional ownership	Percentile rank	High institutional ownership makes it easier for an activist to win support in a proxy fight
	High 30-day volume as % of outstanding		High trading volume allows activists to accumulate large stake without significantly moving stock price
	Float higher than 70%	Binary: 0 if <= 70%, 100 if > 70%	Non-float shares almost always side with management, but there is no distinguishable difference between companies with a 70% float and 100% float
Returns	Low 5-year return	Percentile rank. If blank, use 3-year percentile rank	Long-term negative returns may indicate shareholder dissatisfaction
	Low 3-year return	Percentile rank. If blank, use 50%, as activists less often target companies listed in last 3 years	
	Low 2-year return		
	Low 1-year return		Short-term negative returns provide opportunities for activists to buy stake
	Low 6-month return		
Valuation	Low price/book	Percentile rank vs. industry peers	Low valuations indicate that a sale of the entire company could yield a significant premium to the current price
	Low LTM EV/Sales		
	Low forward EV/EBITDA	Percentile rank vs. industry peers. Blended forward 12 months	
	Low forward P/E		

The average percentile rank of activist targets for each of the 15 percentile-ranked factors is shown in graph below, sorted by highest average score.



For example, in the first row above, creating a ranking of Russell 3000 companies using only 5-year return data would show the average activist target was located in the 64th percentile in the year-end prior to campaign start (companies with the lowest returns are in the 99th percentile and higher returns are in the 1st percentile).⁴

Another way to explore single-factor correlation to activism is to review hit rates within quintiles: On average, what percent of companies in each quintile are targeted by activist campaigns in the following 12 months?

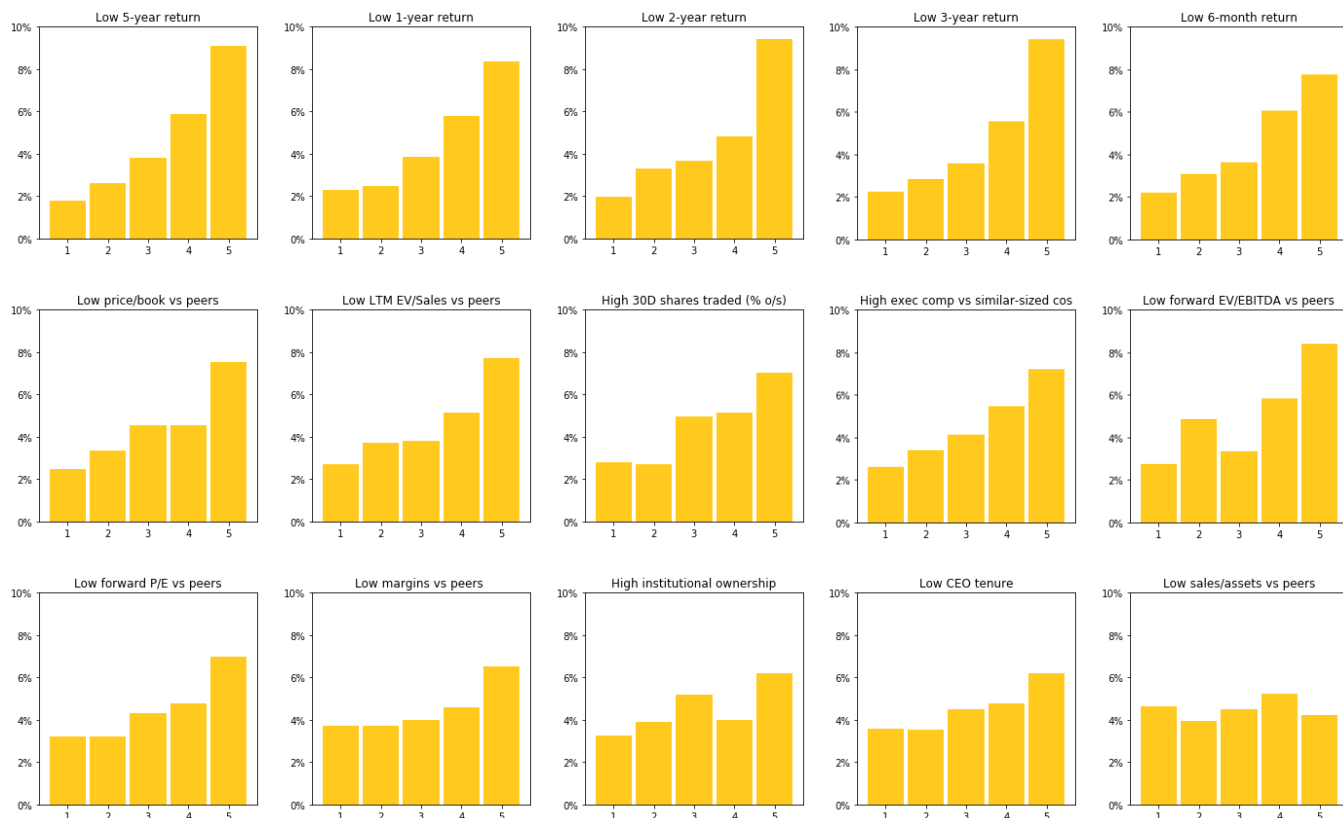
⁴ The results in 2020 were poor for two reasons. First, the market disruption in early 2020 meant the companies that were vulnerable in the last three quarters of the year were very different from the companies in the list on January 1. Second, the results are skewed by five strongly performing companies that TCI Fund Management targeted for environmental proposals in 2020 (Charter, Alphabet, Union Pacific, S&P Global and Moody's – all five were in the bottom quintile of the score). Recognizing the unique nature of these five campaigns and their negative correlation to most campaigns, we excluded them during the process of selecting our final 17 factors but included their effect in the presentation of our results. Had we excluded the effect of these five campaigns from the chart above, the average activism score percentile ("All factors combined" row in above chart) of activist targets in 2020 would have been 69.4% instead of 66.7%.

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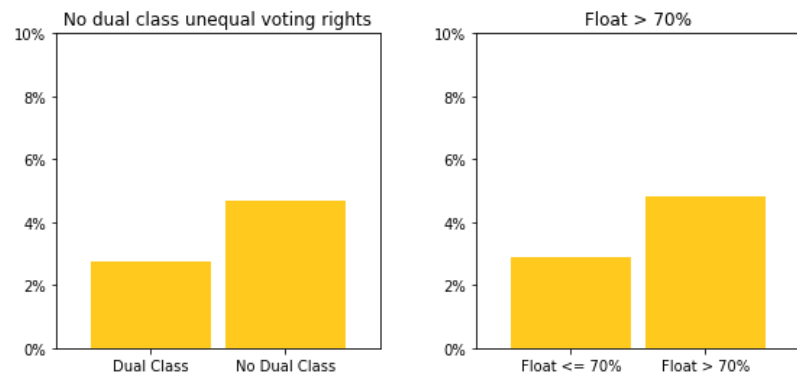
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In the graphs below, the X-axis shows each quintile (there are an equal number of companies in each quintile). The first quintile (on the left) has the lowest expected activism chances, and the last quintile has the highest (i.e., 80-99th percentile for the specific factor). The Y-axis is the percent of companies facing activist campaigns over the next year for each quintile.

The graphs are ordered by each factor's correlation to activism.



Two factors are binary instead of percentile-ranked:



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Although some factors (such as sales/assets ratio) have only minimal correlation to activist campaigns by themselves, we found that these factors are useful contributors when combined with the other factors in the score.

In addition, some factors may not be items that activists look for, but serve as a proxy for a less measurable item. For example, few activists are looking for companies with new CEOs, but a short CEO tenure may indicate significant change or recent disruptions.

Below is a sampling of factors we discarded. Exclusion did not necessarily mean the factor was not correlated with activism, but rather that it did not improve results when combined with the other 17 factors.

Governance

- Director support, say-on-pay support
- Percent of non-executive directors on 3+ boards
- Board size vs. similar size (market cap) companies
- Poison pill, staggered board

Operations

- Net cash as percent of market cap, net debt/EBITDA, assets to equity
- Return on equity, return on invested capital, Economic Value Added (EVA)
- Earnings per share (EPS) growth, sales growth, employee growth
- Gross margin, operating margin
- Capital expenditures/sales, working capital/sales, cash conversion cycle
- Dividend, dividend payout, total payout ratio

Ownership

- Hedge fund ownership, short interest
- Insider ownership

Returns

- Returns vs. peers over various timeframes
- Relative Strength Index (RSI), volatility

Valuation

- Number of analyst ratings, average analyst rating
- Free cash flow yields (levered and unlevered), EV/EBIT

On the Terminal

Bloomberg clients may apply the Activism Screening Model in EQS to any index or group of securities. Below is a screenshot of results as of December 31, 2020.

Overview	Returns	Valuation	Estimates	Actuals	Credit	Technicals	Custom	Results				
Add Column										90 Fields		
Group By										90 Stats...		
None										3058 Securities		
Ticker	Short Name	Activism I Score	Market Cap	Total Return:M-6	Total Return:Y-1	Total Return:Y-2	Total Return:Y-3	Total Return:Y-5	Free Float %	Instit % Shrs Out	Daily Shares Traded %	
101 EXPR	US EXPRESS INC	85.18	59.10M	-40.91	-81.31	-82.19	-91.03	-94.73	92.60	75.86%	7.91	
102 SCOR	US COMSCORE INC	84.94	181.24M	-19.68	-49.60	-82.74	-91.26	-93.95	82.42	90.59%	0.63	
103 DXC	US DXC TECHNOLOGY C	84.18	6.55B	56.06	-30.54	-49.92	-67.26	--	98.94	90.02%	0.91	
104 TMST	US TIMKENSTEEL	83.94	210.86M	20.05	-40.59	-46.57	-69.26	-44.27	78.75	67.81%	0.72	
105 SIEN	US SIENRA INC	83.82	196.27M	0.52	-56.49	-69.39	-72.33	-34.29	90.89	81.32%	1.88	
106 MAC	US MACERICH CO	83.59	1.59B	23.89	-53.86	-68.70	-78.26	-80.78	92.05	104.90%	4.14	
107 FARM	US FARMER BROS CO	83.47	81.91M	-36.38	-68.99	-79.98	-85.47	-85.53	78.25	85.70%	0.77	
108 PVAC	US PENN VIRGINIA	82.29	154.28M	6.51	-66.56	-81.22	-74.05	--	93.94	80.96%	4.57	
109 BTU	US PEABODY ENERGY	82.24	235.70M	-16.32	-73.57	-91.35	-93.22	--	68.67	101.52%	4.41	
110 THS	US TREEHOUSE FOODS	82.06	2.40B	-2.99	-12.39	-16.21	-14.09	-45.85	99.50	120.50%	1.02	

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Below are the top 25 companies that were not subject to an activist campaign as of December 31, 2020. (EQS does not filter out companies that are already subject to activist campaigns, so comScore, Macerich, Farmer Bros and Peabody, which already have activists, appear in the screenshot but are not included in the list below.)

Ticker	Company	Sector	Market Cap (USD Mln)
EXPR	Express, Inc.	Consumer Discretionary	\$59
DXC	DXC Technology Company	Technology	\$6,551
TMST	TimkenSteel Corporation	Materials	\$211
SIEN	Sientra, Inc.	Health Care	\$196
PVAC	Penn Virginia Corporation	Energy	\$154
THS	TreeHouse Foods, Inc.	Consumer Staples	\$2,401
APTS	Preferred Apartment Communities	Real Estate	\$369
TDC	Teradata Corporation	Technology	\$2,456
VREX	Varex Imaging Corporation	Health Care	\$653
RLGY	Realogy Holdings Corp.	Real Estate	\$1,515
ASMB	Assembly Biosciences, Inc.	Health Care	\$200
SM	SM Energy Company	Energy	\$701
CHS	Chico's FAS, Inc.	Consumer Discretionary	\$191
ARCH	Arch Resources, Inc.	Materials	\$663
AYI	Acuity Brands, Inc.	Industrials	\$4,461
NERV	Minerva Neurosciences, Inc.	Health Care	\$100
RRGB	Red Robin Gourmet Burgers, Inc.	Consumer Discretionary	\$299
HRTG	Heritage Insurance Holdings, Inc.	Financials	\$284
GCO	Genesco Inc.	Consumer Discretionary	\$451
FANG	Diamondback Energy, Inc.	Energy	\$7,646
AXL	American Axle & Manufacturing	Consumer Discretionary	\$945
SPTN	SpartanNash Company	Consumer Staples	\$624
EPC	Edgewell Personal Care Company	Consumer Staples	\$1,885
BHF	Brighthouse Financial, Inc.	Financials	\$3,241
BDC	Belden Inc.	Industrials	\$1,869

Appendix

Below are the top 25 companies in each year's ranking, along with whether they faced an activist campaign in the next 12 months. This list excludes companies that were already subject to an activist campaign.

As of 2019-12-31

Company	Market Cap (USD Mln)	Campaign Start	Activist
Mallinckrodt PLC	293		
United Natural Foods Inc	469		
Macy's Inc	5,252	11-May-2020	Vesa Equity Investment
Green Dot Corp	1,200	3-Feb-2020	Starboard Value LP
Whiting Petroleum Corp	670		
Akorn Inc	189		
Tupperware Brands Corp	420		
Contura Energy Inc	165	7-Oct-2020	MG Capital Management Ltd
Edgewell Personal Care Co	1,681		
Realogy Holdings Corp	1,107		
Tutor Perini Corp	647		
Briggs & Stratton Corp	283		
Southwestern Energy Co	1,310		
Fluidigm Corp	242		
TrueCar Inc	506		
TimkenSteel Corp	352		
Signet Jewelers Ltd	1,138		
Vista Outdoor Inc	433		
Cooper-Standard Holdings Inc	558		
Owens & Minor Inc	325		
Rayonier Advanced Materials Inc	243	6-Mar-2020	Ortelius Capital Partners LLC
TiVo Corp	1,074		
DXC Technology Co	9,623		
Lydall Inc	360	5-May-2020	Juniper Investment Co LLC
Big Lots Inc	1,121	6-Mar-2020	Macellum Capital Management

As of 2018-12-31

Company	Market Cap (USD Mln)	Campaign Start	Activist
United Natural Foods Inc	543		
Owens & Minor Inc	394		
Lannett Co Inc	195		
Triumph Group Inc	573		
ServiceSource International Inc	100	2-Apr-2019	Cannell Capital LLC
Bed Bath & Beyond Inc	1,563	25-Mar-2019	Legion, Ancora, Macellum
Realogy Holdings Corp	1,735		
Francesca's Holdings Corp	35	5-Aug-2019	Cross River Management LLC
Red Robin Gourmet Burgers Inc	347	9-May-2019	Vintage Capital Management
YRC Worldwide Inc	107		
Express Inc	350		
Mallinckrodt PLC	1,316		
NN Inc	283	18-Jan-2019	Legion Partners
RR Donnelley & Sons Co	279	29-Aug-2019	NuOrion Advisors LLC
Endologix Inc	74		
PG&E Corp	12,319	1-Mar-2019	BlueMountain & ValueAct
Signet Jewelers Ltd	1,649		
CIRCOR International Inc	423	23-May-2019	GAMCO Investors Inc
JC Penney Co Inc	328		
Pier 1 Imports Inc	26		
GameStop Corp	1,287	12-Feb-2019	Hestia & Permit
Summit Materials Inc	1,427	17-Jun-2019	Southeastern Asset Mgmt
Denbury Inc	788		
Frontier Communications Corp	251	20-Jun-2019	Aurelius Capital
Big Lots Inc	1,158		

As of 2017-12-31

Company	Market Cap (USD Mln)	Campaign Start	Activist
Mallinckrodt PLC	2,143		
Vista Outdoor Inc	835		
Vitamin Shoppe Inc	106	19-Mar-2018	Vintage & Shah Capital
Magnite Inc	93		
Endo International PLC	1,731		
Cardtronics PLC	846	31-Jan-2018	Hudson Executive Capital LP
Owens & Minor Inc	1,156		
GameStop Corp	1,818	16-May-2018	Tiger Management LLC
Essendant Inc	349	16-May-2018	Sycamore Partners LLC
Triumph Group Inc	1,350		
RR Donnelley & Sons Co	652		
TiVo Corp	1,904		
AMAG Pharmaceuticals Inc	469		
DHI Group Inc	95	25-May-2018	TCS Capital Management LLC
PHH Corp	335		
CECO Environmental Corp	178		
Fossil Group Inc	377		
Bed Bath & Beyond Inc	3,132		
Unisys Corp	411		
Libbey Inc	166		
Veritiv Corp	454		
Genesco Inc	647	16-Jan-2018	Legion Partners & 4010 Capital
TreeHouse Foods Inc	2,830		
Pandora Media LLC	1,199		
Realogy Holdings Corp	3,613		

As of 2016-12-31

Company	Market Cap (USD Mln)	Campaign Start	Activist
Myriad Genetics Inc	1,140		
Abercrombie & Fitch Co	812	18-Jul-2017	SLS Management LLC
Stage Stores Inc	119		
Endo International PLC	3,671		
Dynegy Inc	992		
Triumph Group Inc	1,313		
RR Donnelley & Sons Co	1,139		
Express Inc	844		
Rent-A-Center Inc/TX	598	30-Jan-2017	Engaged Capital LLC
Kindred Healthcare LLC	669		
Tidewater Inc	161		
Community Health Systems Inc	636	13-Mar-2017	Shanda Asset Management
Impax Laboratories LLC	979		
GameStop Corp	2,573		
Computer Programs and Systems	319		
Allscripts Healthcare Solutions	1,890		
Guess? Inc	1,021		
Adeptus Health Inc	161		
LSB Industries Inc	235		
SUPERVALU Inc	1,243	25-Oct-2017	Blackwells Capital LLC
Comtech Telecommunications	279		
FireEye Inc	2,036		
Endologix Inc	473		
Weatherford International PLC	4,895		
Stratasys Ltd	861		

Note: Kindred Healthcare faced an activist campaign from Brigade Capital to oppose a merger in December 2017; as noted earlier, campaigns that started with merger opposition are ignored in this model as these often occur at companies that an activist would not normally target.

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