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The second wave of hedge fund activism: The importance of reputation, clout, and expertise☆

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ABSTRACT

Using a large dataset of hand-collected information on activist interventions from 2008 to 2014, we examine why certain hedge funds succeed in the face of competition. We document that the top hedge funds succeed, not merely because of how they select targets, but because they acquire a reputation for what we label "clout and expertise." These hedge funds do not intervene more frequently; to the contrary, activists with more interventions are associated with lower returns. Instead, top activists have a demonstrated ability to succeed in difficult interventions by targeting large firms, launching successful proxy fights, filing and winning lawsuits, pressuring target boards through the media, overcoming anti-takeover defenses, and replacing board members. These activists' successes appear to result more from board representation, improved performance, and monitoring management than from capital structure or dividend policy changes.

1. Introduction

Hedge fund activism remains an important phenomenon. Several papers have studied an initial wave of hedge fund activism, through 2008, and have found that activists achieved substantial success during this period.[1] However, studies of this first wave of hedge fund activism suggested that activism might be in decline as the market for activism grew, competition increased, and the most viable opportunities for interventions declined.[2] This raises questions about how and why some hedge fund activists were able to achieve success in the face of increased competition. We address these questions by examining a second wave of hedge fund activism during the period 2008–2014.

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[1] Clifford (2008); Brav et al. (2008); Bebchuk et al. (2013); Klein and Zur (2009), and Becht et al. (2014), for example, suggest that hedge fund activism generated significantly higher announcement period abnormal stock returns than a control sample of passive block holders, and that hedge fund activists have achieved measurable success, at least in terms of traditional metrics such as Tobin's Q. Bebchuk et al. (2013) find that hedge fund activism through 2007 was followed by improved operating performance during the post-intervention 5-year period.

[2] Brav et al. (2008), for example, find that as hedge fund activism became more common, the average abnormal returns at the filing of a Schedule 13D dropped, from 15.9% in 2001 to 3.4% in 2006. Bratton (2010) finds some evidence to support this conclusion, showing that when the sample in Bratton (2007) is expanded to cover through mid-2009, the successes of the hedge fund activists are less robust. Gantchev et al. (2014) analyze interventions through 2011, and report an average cumulative abnormal return of 5%, as compared to returns in the range of 7% for earlier periods.

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The period 2008–2014 is a particularly important sample period to study. It represents the period after the financial crisis, which distorted various aspects of market interventions, and after the first wave of activism with its well-documented high, but declining, stock returns. Moreover, this period ends just before the recent disruptions in the market for hedge fund activism, including substantial losses and failed interventions during 2015. Accordingly, 2008–2014 is the appropriate period for examining whether the characteristics of activism changed, and why certain hedge funds were successful.

The literature on hedge fund activism has largely focused on the characteristics of target firms and the changes brought about in target firms by activists. However, the characteristics – and reputations – of the activists remain unexamined. We seek to shift the literature's focus from the targets of activism to the activists themselves. Who are the most reputed hedge fund activists, and what do they do? How do they achieve success, in the face of extreme competition during the second wave of activism?

We show compelling reasons why some top activists are so successful: they acquire a reputation for having the ability to pressure managers in credible ways. We show that the top activists are not merely taking advantage of a superior ability to select target firms. Instead, we find that the most successful activists have acquired a reputation for what we label "clout and expertise," including the demonstrated ability to succeed in the most difficult interventions by targeting large firms, launching successful proxy fights, initiating lawsuits, pressuring target boards using the media, overcoming strong anti-takeover defenses, and replacing board members.

Our findings, in more detail, are as follows. We find that the hedge fund activism industry indeed has become larger and more dispersed during our sample period, with both more participants and more targets. Our sample includes 578 different activist hedge funds in contrast to the 236 activist hedge funds analyzed in Brav et al. (2008). The average size of equity positions taken by hedge fund activists is in the range of 8%, consistent with previous studies. Moreover, no hedge fund activist in our sample has a substantial share of the market.

Even those hedge fund activists with the largest numbers of interventions have relatively small market shares: the highest market share in terms of number of interventions is roughly 3%, and only a handful of activists have market shares of more than 1%. The industry market structure is somewhat more concentrated when interventions are measured based on the aggregate market capitalization of investments, but still only a couple of firms each year have market shares in the range of 10% and above; the vast majority of firms' market shares are below 1%. Based on Herfindahl-Hirshman Index measures, the hedge fund activism industry would not be considered highly concentrated, or even moderately concentrated. Accordingly, any abnormal returns are not likely due to monopoly or oligopoly rents.

However, we also find that the announcement period abnormal stock price returns from hedge fund activism are consistently and robustly high from 2008 through 2014. For example, during the 21-day event window, the average announcement period abnormal stock price return for interventions during 2013 is over 10%, and for our entire sample is over 7%, roughly the same as in studies of the first wave of hedge fund activism. We find that abnormal stock returns increase as the event window becomes longer, consistent with Brav et al. (2008) and Bebchuk et al. (2013).

What is the source of these extraordinary market returns for certain hedge funds in the face of competition? Put another way, to what extent are market reactions to hedge fund activists' interventions driven by their particular attributes and actions? These questions remain unanswered in the literature. We explore some possible answers by examining hypotheses about the characteristics and reputations of individual hedge funds. We ask whether one might better understand the market reaction to hedge fund activism by better understanding the activists themselves.

Specifically, we examine three measures of hedge fund reputation, constructed free of look-ahead bias, based on (1) frequency of intervention, (2) past success, and (3) financial clout and expertise. We find support for the use of each of these measures in various related literatures.

First, hedge fund activists might acquire positive reputations based on expertise they gain from intervening more frequently. For example, Gompers (1996); Gompers et al. (2008), and Ljungqvist et al. (2008) argue that younger venture capital firms may benefit from investing more frequently and rapidly in order to signal their skills and acquire a reputation. This "frequency of intervention" theory is consistent with the notion that participants in a wide range of areas – medicine, sports, business, and academia – acquire positive reputations based on the number of times they have been involved in the relevant procedures or practices.

Second, hedge fund activists might acquire positive reputations based on past performance, more specifically, high returns in the recent past. Zur (2008) makes the point that the market rewards hedge funds with a reputation for being successful, but does not reward hedge funds with a reputation for simply being aggressive. A long-standing literature (e.g., Stickel, 1992) establishes that there can be a positive relationship between returns and reputation in various contexts. This "past returns" theory is consistent with the notion that investment funds with strong past performance acquire positive reputations and therefore are welcomed with strong market returns in future interventions[3]; this theory is in line with the performance persistence argument for hedge funds put forth in Boyson et al. (2015) and Boyson et al. (2016).

Third, hedge fund activists might acquire positive reputations based on their financial clout and expertise. The literatures on private equity and venture capital (e.g., Hochberg et al., 2007, and Nahata, 2008) establish the importance of venture capital size, networks, and experience in investment performance. This "clout and expertise" theory is consistent with the notion that

[3] As an example, on January 25, 2013, Potomac (an activist with strong past returns) filed a Schedule 13D disclosing that they had accumulated a 9.8% stake in PLX, and had sent an open letter to PLX's board stating the belief that, "management must immediately commence a process of a thorough review of all strategic alternatives available to the Company and we do not believe that PLX should remain an independent public company." The 3-day, 7-day and 21-day announcement period abnormal market returns were 2.9%, 5%, and 18%, respectively.

some activists have demonstrated an ability to intervene with large investments in large targets, or in challenging scenarios, and might have better access to both capital (e.g., Diamond, 1989) and labor (e.g., Berk and van Binsbergen, 2015). Their financial clout allows them to choose larger targets and could also make them less risk averse to engage in more proxy fights and push for changes. Their expertise includes both their ability to generate new strategic initiatives for target firms but also skill in obtaining board representation or influence so that their ideas are implemented.

We find support for the third hypothesis. Specifically, we find that hedge fund activists involved in the largest dollar investments in the recent past generate the largest announcement period abnormal returns in future interventions, whereas activists that had superior announcement period market reactions in the recent past generate smaller announcement period returns. Perhaps most surprisingly, hedge funds involved in more frequent, but smaller, interventions, perform worse than other hedge funds, in terms of announcement period returns. We create a new measure of hedge fund reputation based on these findings. We call the top activists *Top Investor Hedge Funds,* based on the size of their aggregate investments in the recent past.

Top Investor Hedge Funds' investment announcements result in a 21-day announcement-period abnormal return of 12.4%, on average, in our sample period as compared to 6.6% for the other hedge funds in our sample, notwithstanding the fact that these top activists target significantly larger and better performing companies. We also find evidence that the market's apparent expectation of positive returns from activism by *Top Investor Hedge Funds* is well founded. Interventions by *Top Investor Hedge Funds* are associated with immediate improvements in targets' operating performance. Return on assets, sales revenue growth, and research and development spending at targets are all significantly higher after intervention by *Top Investor Hedge Funds*, as compared with other hedge funds. Moreover, the targets of *Top Investor Hedge Funds* are significantly less likely to be delisted because of liquidation. Interestingly, *Top Investor Hedge Funds* target a significantly lower proportion of finance firms, as compared to other hedge funds, perhaps because finance firms became more highly regulated after the 2008 financial crisis, and therefore were regarded as less attractive targets.

We recognize that the *Top Investor Hedge Funds* might have an advantage in selecting target firms. In other words, associations between top hedge fund involvement and target firm success can be complicated by a top hedge fund's unobserved criteria for involvement in a target. We control for this, using instrumental variables based on hedge fund features that predict hedge fund-target firm associations, but not investment returns, or, alternatively, using a matched control sample and interacted fixed effects. We find that the association between *Top Investor Hedge Funds* and announcement period abnormal returns remains significantly positive.

Examining the features of hedge fund activists, we find that *Top Investor Hedge Funds* have existed for longer, and have about three times as much assets under management, as other hedge funds. Thus, they have financial clout, in part from their access to internal funding sources. They also are aggressive, and demonstrate significant “expertise” in getting target boards of directors to agree to their demands. This expertise is demonstrated in numerous ways. At the start of their interventions, *Top Investor Hedge Funds* are more likely than other hedge funds to explicitly signal their intent to replace one or more board members at the time of 13D filings, and then, once they obtain their equity stakes in target firms, they are significantly more likely to commence proxy fights and lawsuits related to board representation changes. *Top Investor Hedge Funds* win about three times as many proxy fights and lawsuits per hedge fund, as compared to the other hedge funds, which eventually results in their gaining board seats in about three times as many target firms. We also show that they are aggressive in the media, which generates pressure on target boards of directors to capitulate to their demands. Our results are consistent with findings in Boyson and Pichler (2016) that the strength of a hedge fund's counter-resistance to target firms is an important determinant of outcomes in activist interventions. Our findings also extend the model of activism in Johnson and Swem (2016), which is limited to one variable (the activist's willingness to initiate a proxy fight).

We document that *Top Investor Hedge Funds* target firms with more anti-takeover defenses, and firms with significantly lower insider ownership, than firms targeted by other hedge funds. This finding is striking: top activists generate abnormal returns targeting firms that likely have higher agency costs. Finally, we show that the positive results achieved by the most reputed activists are more likely to be due to operational improvements stemming from board representation at companies they target and by monitoring target management, rather than through any significant capital structure or dividend policy changes as suggested in recent literature.

2. Data and descriptive statistics

We create a new database of activist events using hand-collected data. Initially, we use Hedge Fund Solutions (HFS), to collect data on all events reported from January 1, 2008 until May 1, 2014. After acquiring from HFS information including the name of the targeted company and the names of the hedge funds involved in the event, we use the Morningstar Document Research database to search for all 13D filings because investors file Schedule 13Ds if they have an interest in influencing management of the targeted company.

Once we assemble complete sets of all hedge funds' filings, we hand code the information needed for our analysis for the entire time period in which the hedge funds continue to make 13D filings related to the targeted firm. This approach permits us to track all of the hedge funds' stock transactions, as well as any put or call transactions that they disclose, over the entire time period of their investment. We also examine the stated objectives in the 13D filings, especially if they include language about replacing one or more directors.

We code the date of the announcement of the initial stake. After an initial Schedule 13D filing, hedge funds are required to “promptly” file amendments to their initial filing if there are any “material” changes to their ownership stakes. These amendments

provide us with a complete picture of the hedge funds' stock ownership positions over time as well as any stated purpose for engaging in the securities purchases.

We then match this data with the CRSP database to obtain target firm stock returns and delisting data. We also match this data to the quarterly Compustat database to obtain target firm financial data for four quarters immediately preceding the intervention as well as quarters post-intervention. After these screens, we have 1003 shareholder activism events during our sample period of January 1, 2008 through May 1, 2014. Our methodology is consistent with earlier approaches in the literature, and supports a conclusion that we have collected the relevant 13D filings during our sample period.[4]

To link hedge fund activist performance with the features and actions of particular activists, we collect data for 2010–13 on a number of hedge fund characteristics from *Activist Insight*. These include the number of top management and board personnel each year (including CEO, CFO, and COO, as well as board chairman, vice-chairman, and other directors); the total assets under management as of the end of each year; the number of portfolio companies (target firms) invested in; and the number of portfolio companies (target firms) in which a hedge fund holds at least one board seat as of the end of each year. We gather the hedge funds' year of formation and state of incorporation, and the industry sectors of their investments. We also obtain data from the *Shark Repellent* database regarding the number of proxy fights and lawsuits related to board representation initiated by each hedge fund, and their outcomes, each year of our sample period.

We gather data on six anti-takeover provisions from the *Investor Responsibility Research Center* database – on staggered boards, limits on shareholder bylaw amendments, poison pills, golden parachutes, supermajority voting requirements for mergers, and limits on charter amendments – to examine associations of target-firm management entrenchment measures with hedge fund investments.

We use the above data to study the three hypotheses about reputation described above, based on (1) frequency of intervention, (2) past success, and (3) financial clout and expertise. First, we examine the *Most Active Hedge Funds*, defined as those with at least 5 interventions during the most recent previous 3-year period. That is, *Most Active Hedge Funds* in 2011 are those with at least 5 interventions during this period: 2008–2010. Second, we examine the *Top Return Hedge Funds*, defined as the ones with average 21-day announcement period abnormal returns (over and above the CRSP value-weighted index) of at least 10% and with at least 3 interventions in rolling windows of past 3 years. We use the 21-day abnormal returns to include the market reaction to the anticipated involvement of the hedge funds. Third, we examine the *Top Investor Hedge Funds*, defined as the ones that are in the top 10 league table of aggregate dollar investments during the most recent previous 3-year period.

The pairwise correlations between *Top Investor Hedge Funds* and *Top Return Hedge fund* is 24.9%, between *Top Return Hedge Funds* and *Most Active Hedge Funds* is −8.3%, and between *Top Investor Hedge fund* and *Most Active Hedge Funds* is 36.7%. Thus, the three reputation measures are relatively different.

All variables are defined in Appendix A.

3. Reputed activists, intervention features, and outcomes

3.1. Descriptive statistics

Although some evidence, such as the data cited in Cheffins and Armour (2012), suggests that the number of hedge fund interventions declined between mid-2009 and early 2010, anecdotal evidence suggest that hedge fund activists continue to target publicly traded companies in high-profile interventions with reasonable regularity. We find robust support for this anecdotal evidence of a "second wave" of hedge fund activism.

Table 1A reports annual descriptive statistics of our sample. We include the number of hedge fund interventions and various characteristics of target firms. Specifically, we report average total assets, average market capitalization, average return on assets, average book-to-market ratio, the proportion of Nasdaq-listed targets, and the percentage of targets that are finance firms (based on SIC codes in the range 60 to 67). The evidence shows that hedge fund activists are targeting larger firms on average than they have in the recent past. Targeted firms, on average, had assets of over $2 billion. We find an average market capitalization of $1.03 billion, similar to the $1.08 billion reported in Gantchev et al. (2014) for an overlapping sample period. By comparison, the average market capitalization reported by Brav et al. (2008) for 2001–2006 was much lower: $0.73 billion.

On average, the targets in our sample were not profitable before intervention. Our descriptive statistics suggest that activists generally targeted firms that might need to improve their profitability and/or cash flows. Average return on assets was negative every year. We report an average return on assets of negative 6%, lower than the positive 1% found by Gantchev et al. (2014), and lower than the target return on assets in studies based on earlier sample periods, including target return on assets of 5% reported by Brav et al. (2008), and 2% reported by Bebchuk et al. (2013). We document an average Tobin's Q (as proxied by the inverse of our book-to-market ratio) of 0.98, significantly less than the 1.99 reported by Gantchev et al. (2014) or the 1.54 reported by Brav et al. (2008). Approximately two-thirds of the targeted firms in our sample are listed on NASDAQ, and about one-fifth are in the financial sector.

Table 1B displays annual descriptive statistics of the mean announcement period abnormal market reaction (over and above the CRSP value-weighted returns) to intervention announcement, computed over 3 standard windows, (−1, +1), (−3, +3), and (−10, +10), the average percentage of shares held by the hedge fund on the first date that they publicly disclosed their

[4] Brav, Jiang, Thomas, and Partnoy (2008) observe 1059 interventions from 2001–2006, and 757 from 1994–2000; Bebchuk et al. (2013) observe 1283 interventions from 2001–2007.

Table 1
Descriptive statistics of hedge fund interventions.

Year	N	Average assets	Average market cap	Average ROA	Average book to market	Proportion Nasdaq listing	Proportion finance target
Panel A							
2008	242	3356.5	1159.2	−0.05	0.94	66.11%	17.77%
2009	124	1117.3	286.8	−0.17	1.49	66.13%	25.80%
2010	156	1236.7	674.9	−0.13	0.74	66.02%	17.95%
2011	165	1874.3	1106.2	−0.01	0.91	68.48%	18.18%
2012	146	2118.7	1207.6	−0.01	1.04	66.43%	13.69%
2013	135	2898.2	1623.2	−0.04	0.96	57.04%	21.48%
2014	35	1758.6	1106.3	−0.04	0.78	62.85%	17.14%
All	1003	2219.4	1033.9	−0.06	0.98	65.20%	18.74%

Year	N	Average CAR(−1 + 1)	Average CAR(−3,+3)	Average CAR (−10,+10)	Average percentage of shares held on filing date	Proportion of events with call options	Proportion of events with put options
Panel B							
2008	242	3.01%	4.17%	5.09%	8.48	5.37%	1.23%
2009	124	3.44%	4.83%	12.38%	7.38	7.32%	3.22%
2010	156	2.49%	3.29%	5.95%	9.08	5.13%	3.85%
2011	165	3.40%	2.58%	4.30%	8.27	5.49%	4.27%
2012	146	2.16%	3.91%	8.27%	8.10	10.96%	6.16%
2013	135	4.22%	5.37%	10.04%	7.90	5.93%	1.48%
2014	35	0.01%	0.16%	0.22%	8.23	8.57%	0.00%
All	1003	3.06%	3.95%	7.17%	8.26	6.59%	3.09%

Panel A shows the year-by-year number of interventions, and target firm characteristics. The average total assets, the average market capitalization (market value of equity), the average profitability (measured by Return on Assets), the average book-to-market value of equity ratio, the proportions of Nasdaq-listed targets, and finance-firm targets are reported. Panel B reports the mean announcement period abnormal market reaction to interventions computed over 3 different periods, the average percentage of shares held by the hedge fund as on the filing date, and the proportion of interventions that entailed call and put options. All variables are defined in Appendix A.

investment, and the proportion of interventions that involved the use of call and put options. The average 21-day announcement period abnormal return was 7.17%, a little more than the 21-day announcement period abnormal return of 6% found by Bebchuk et al. (2013), and similar to the 41-day announcement period abnormal return of 7% to 8% reported by Brav et al. (2008). The average abnormal market return was positive every year: investors generally seem to have welcomed "second wave" activist interventions. The average shareholding as of the filing date, in our sample, was 8.26%, consistent with studies of previous periods, which suggests that activists during the "second wave" normally sought to avoid stakes of 10% or more, which would have triggered certain costly legal and regulatory consequences.

Although the use of derivatives in hedge fund activism has received much attention in the media and among academics, we find that the use of call and put options was relatively uncommon during the "second wave" of activism. Call and put options were mentioned in only 6.6% and 3.1% of all interventions, respectively. Moreover, the use of call and put options was not a significant independent variable in our regressions of the degree of market reaction to the announcement of intervention. One potential explanation for the dearth of options use is that hedge fund activists were able to achieve their objectives in accumulating their stakes – including secrecy, reliable trade execution, and low cost – by purchasing stock through reliable prime brokers. An alternative explanation is that hedge fund activists used other transactions, including equity and total return swaps, instead of options, but, if so, the hedge fund activists that engaged in such transactions without disclosing them arguably were violating the applicable disclosure requirements.[5] In any event, the use of derivatives does not appear to have been a statistically significant factor in the analysis of the returns to the "second wave" of hedge fund activism.

3.2. Hedge fund reputation and associations

Next, we examine the associations of reputed hedge funds with target firm and event features and market reaction to activism announcements. Our first reputation measure, *Most Active Hedge Funds,* is defined in terms of those with at least 5 interventions during the most recent previous 3-year period. For example, *Most Active Hedge Funds* in 2011 are those with at least 5 interventions during this period: 2008–2010. The list of *Most Active Hedge Funds*, the number of appearances in annual league tables, and the average annual market share (total market shares over all years of appearances in the annual *Most Active Hedge Funds* league tables, divided by the number of years) are as follows:

[5] See, e.g., CSX Corp. v. Children's Investment Fund Management (UK) LLP, 562 F.Supp.2d 511 (S.D.N.Y.2008), aff'd, CSX Corp. v. Children's Investment Fund Management (UK) LLP, 292 F. App'x 133, 133–34 (2d Cir.2008).

(1) Discovery Capital, 4, 3.39%;
(2) Bulldog Investors, 4, 3.18%;
(3) Starboard Capital (f.k.a. Ramius Group), 4, 2.74%;
(4) ValueAct Capital, 4, 1.93%;
(5) Carl Icahn, 4, 1.85%;
(6) GAMCO Investors, 4, 1.43%;
(7) Mill Road Capital, 4, 1.28%,
(8) Raging Capital, 4, 1.10%;
(9) Joseph Stilwell, 3, 2.34%;
(10) Western Investment, 3, 1.16%;
(11) Baker Street, 3, 0.92%;

Table 2
Hedge fund reputation, target and deal features, and market reaction.

Feature	Most active hedge funds	Other hedge funds
	N = 145	N = 336
Panel A		
Average CAR(−1 + 1)	2.41%	3.54%*
Average CAR(−3 + 3)	3.09%	4.17%
Average CAR(−10 + 10)	5.98%	7.90%*
Average percentage of shares held on filing date	7.73%	8.28%
Average assets	2645.6	2063.2
Average market cap	1565.2	1165.6*
Average ROA	0.00	−0.03*
Average book to market	0.70	1.04***
Proportion Nasdaq-listing	59.31%	66.37%*
Proportion finance firms	26.89%	13.69%***
Proportion of events with call options	7.59%	7.46%
Proportion of events with put options	4.14%	3.58%

Feature	Top return hedge funds	Other hedge funds
	N = 69	N = 412
Panel B		
Average CAR(−1 + 1)	3.47%	3.13%
Average CAR(−3 + 3)	6.02%	3.45%*
Average CAR(−10 + 10)	10.63%	6.72%*
Average percentage of shares held on filing date	8.55%	8.04%
Average assets	4221.9	1882.1***
Average market cap	2372.4	1102.3***
Average ROA	−0.01	−0.02
Average book to market	0.87	0.95
Proportion Nasdaq-listed targets	55.07%	65.77%*
Proportion finance target	5.80%	19.66%***
Proportion of events with call options	2.90%	8.28%
Proportion of events with put options	2.90%	3.89%

Feature	Top investor hedge funds	Other hedge funds
	N = 54	N = 427
Panel C		
Average CAR(−1 + 1)	4.85%	2.95%**
Average CAR(−3 + 3)	7.42%	3.36%***
Average CAR(−10 + 10)	12.43%	6.60%**
Average percentage of shares held on filing date	7.83%	8.15%
Average assets	9785.9	1262.7***
Average market cap	6523.9	624.9***
Average ROA	0.07	−0.03***
Average book to market	0.60	0.98***
Proportion Nasdaq-listing	27.77%	68.85%***
Proportion finance firms	7.41%	18.97%**
Proportion of events with call options	9.25%	7.27%
Proportion of events with put options	5.55%	3.52%

This table reports the average announcement period abnormal market returns, the average target firm characteristics, and the average deal features associated with the reputed Hedge fund interventions, compared to those of other hedge fund interventions. Reputed hedge funds are, alternatively, defined as *Most Active Hedge Funds*, *Top Return Hedge Funds*, and *Top Investor Hedge Funds*. The sample period is 2011–2014. All variables are defined in Appendix A.
*, **, and *** denotes significantly different from the other cohort at the 10%, 5%, and 1% significance levels.

(12) Relational Investors, 3, 0.91%;
(13) MMI Investments, 3, 0.88%;
(14) City of London Investment Group, 3, 0.86%;
(15) Elliott Associates, 3, 0.83%;
(16) Norman Pessin, 3, 0.83%;
(17) Lawrence Seidman, 3, 0.76%; and.
(18) Clinton Group, 3, 0.74%.

Table 2A examines the univariate associations between the *Most Active Hedge Funds* and target firm characteristics, deal features, and market reaction, as compared to those of other hedge fund interventions. The sample period is 2011–2014. The market reaction to the announcement of intervention was significantly *lower* for the *Most Active Hedge Funds*, relative to the remainder of the sample.[6] The *Most Active Hedge Funds* invested in significantly larger (measured in terms of market capitalization), and more profitable (measured by ROA), targets, as compared to other hedge funds. These target firms also had significantly lower book-to-market ratios (which is often used to determine a firm's lack of real options and is a proxy for (the inverse of) Tobin's Q) than other hedge funds.

This indicates that the *Most Active Hedge Funds* during the "second wave" of activism chose the better performing targets: those that were larger, more profitable and had better future prospects (a low book-to-market implies that a firm's stock is relatively more expensive than the replacement cost of its assets, which could imply investor optimism about a firm's real options). They also invested in fewer NASDAQ listed firms and more frequently in finance industry targets than other hedge funds.

Turning to our second reputation measure, overall, in our sample, the *Top Return Hedge Funds*, the number of appearances in annual league tables, and with their average *CAR(−10,10)* are:

(1) Pershing Square, 1, 24.5%
(2) Potomac Capital, 1, 19.0%
(3) Red Oak Partners, 1, 15.2%
(4) Jana Partners, 1, 14.5%
(5) Baker Street Capital, 2, 12.8%
(6) Timothy Stabosz, 1, 12.2%
(7) Becker Drapkin Funds, 1, 12.0%
(8) Norman Pessin, 1, 11.9%
(9) Privet Fund, 1, 11.7%
(10) Relational Investors, 2, 11.7%, and
(11) Starboard, 4, 11%.

Here we expect that if hedge fund reputation is acquired by generating high returns in prior investments, then *Top Return Hedge Funds'* investments would be associated with high current market reactions. Table 2B reports the associations of *Top Return Hedge Funds* with target-firm and event features and market reaction to activism announcements. The 7-day and 21-day market reactions to the announcement of interventions are significantly higher for the *Top Return Hedge Funds*, but only at the 10% significance level, relative to the remainder of the sample; the 3-day return is not. The *Top Return Hedge Funds* invested in significantly larger targets (measured in terms of both total assets and market capitalization), as compared to other hedge funds. They favored finance firms and Nasdaq-listed firms significantly less than do other hedge funds.

Turning to our last reputation measure, Table 2C shows the associations of *Top Investor Hedge Funds* with target firm and deal features. The number of appearances in annual list of *Top Investor Hedge Funds*, and the average annual dollar investment (total dollar investment as of the filing date, divided by 4) are as follows:

(1) Carl Icahn, 4, 5871.7;
(2) ValueAct Capital, 4, 3861.0;
(3) Jana Partners, 3, 2039.2;
(4) Pershing Square, 3, 1052.1;
(5) Relational Investors, 3, 1400.1;
(6) Southeastern Asset Management, 3, 1423.2;
(7) Third Point, 3, 1039.0;
(8) Trian Fund, 3, 1548.4;
(9) Elliott Associates, 2, 687.7; and
(10) Soroban Capital, 2, 1373.9.

During the "second wave" of activism, *Top Investor Hedge Funds* invested in significantly larger (measured in terms of both total assets and market capitalization) and more profitable (measured by ROA) targets that also had significantly lower book-

[6] As an example, on August 13, 2012 Discovery Group filed 13D disclosing a 6.5% ownership stake in Horizon Pharma, Inc. Moreover, Discovery Group indicated that it did not have any current plans or proposals to change the board composition, sell the company, or otherwise seek major strategic or governance changes. The stock price of Horizon Pharma declined significantly as Discovery Group was purchasing its stake: its July 2012 purchases were at more than $7 per share; thereafter, the share price steadily declined. The 3-day, 7-day and 21-day announcement period abnormal market returns were significantly negative: −3%, −9% and −31% respectively. Indeed, Discovery Group and Biotechnology Value Fund, for example, have average negative 21-day announcement period market reactions from their interventions.

Table 3
Top investor hedge funds and market reaction.

	CAR(−1 + 1)		*CAR(−3 + 3)*		*CAR(−10 + 10)*	
Panel A						
Most active hedge funds	−0.01	−0.01	−0.01	−0.01	−0.01	−0.01
	(−1.01)	(−0.96)	(−0.62)	(−0.70)	(−0.13)	(−0.32)
Market cap	−0.01	−0.02	−0.01	−0.01	−0.01	−0.01
	(−1.05)	(−1.47)	(−0.84)	(−0.93)	(−1.37)	(−1.25)
ROA	0.02	0.03*	0.07**	0.07**	0.08*	0.08
	(1.62)	(1.66)	(2.56)	(2.30)	(1.72)	(1.59)
Book to market	0.01	0.01	0.01	0.01	0.03**	0.04***
	(1.43)	(1.54)	(1.18)	(1.39)	(2.36)	(2.66)
Nasdaq-listing	0.00	0.00	0.00	0.00	0.01	0.02
	(0.06)	(0.04)	(0.06)	(0.05)	(0.80)	(0.80)
Finance firm	−0.03***	−0.03***	−0.03***	−0.03***	−0.04**	−0.04**
	(−4.34)	(−4.17)	(−3.43)	(−3.36)	(−2.14)	(−2.05)
Percentage of shares held on filing date	0.00	0.01	0.01	0.01	0.02	0.01
	(0.11)	(0.37)	(0.41)	(0.06)	(1.20)	(0.93)
Call option	0.01	0.01	0.02	0.02	0.02	0.01
	(0.40)	(0.16)	(0.67)	(0.73)	(0.39)	(0.31)
Put option	0.01	0.01	0.03	0.03	0.05	0.05
	(0.73)	(0.78)	(0.92)	(0.85)	(0.90)	(0.84)
β_Y	Yes	No	Yes	No	Yes	No
β_I	Yes	No	Yes	No	Yes	No
$\beta_I \times \beta_Y$	No	Yes	No	Yes	No	Yes
Adjusted R^2	8.58	9.31	8.15	9.42	8.80	9.26
Panel B						
Top return hedge fund	0.01	0.01	0.02*	0.03*	0.04*	0.05**
	(0.24)	(0.11)	(1.86)	(1.93)	(1.94)	(2.16)
Market cap	−0.01	−0.02	−0.01	−0.01	−0.01	−0.01
	(−1.08)	(−1.54)	(−1.15)	(−1.25)	(−1.61)	(−1.54)
ROA	0.02	0.02	0.07***	0.07***	0.07*	0.07
	(1.60)	(1.62)	(3.50)	(3.21)	(1.69)	(1.54)
Book to market	0.01	0.01	0.01	0.02	0.03**	0.04***
	(1.52)	(1.62)	(1.26)	(1.48)	(2.42)	(2.75)
Nasdaq-listing	0.01	0.00	0.01	0.00	0.02	0.02
	(0.06)	(0.03)	(0.18)	(0.09)	(0.91)	(0.95)
Finance firm	−0.03***	−0.03***	−0.03***	−0.03***	−0.03*	−0.03*
	(−4.47)	(−4.31)	(−3.15)	(−3.05)	(−1.84)	(−1.74)
Percentage of shares held on filing date	0.00	0.03	0.00	0.00	0.01	0.01
	(0.05)	(0.31)	(0.40)	(0.06)	(1.19)	(0.91)
Call option	0.01	0.01	0.02	0.02	0.03	0.02
	(0.42)	(0.18)	(0.83)	(0.91)	(0.52)	(0.46)
Put option	0.01	0.01	0.03	0.02	0.04	0.04
	(0.70)	(0.74)	(0.83)	(0.72)	(0.83)	(0.72)
β_Y	Yes	No	Yes	No	Yes	No
β_I	Yes	No	Yes	No	Yes	No
$\beta_I \times \beta_Y$	No	Yes	No	Yes	No	Yes
Adjusted R^2	8.04	8.15	8.67	9.10	9.49	10.25
Panel C						
Top investor hedge fund	0.03**	0.02**	0.05***	0.04***	0.11***	0.12***
	(2.37)	(2.07)	(3.15)	(2.89)	(3.59)	(3.68)
Market cap	−0.01**	−0.01**	−0.01***	−0.01***	−0.01***	−0.01***
	(−2.22)	(−2.36)	(−3.23)	(−2.86)	(−3.51)	(−3.46)
ROA	0.02	0.02	0.06***	0.07***	0.06	0.05
	(1.36)	(1.42)	(3.20)	(2.98)	(1.39)	(1.29)
Book to market	0.01*	0.01*	0.01	0.01	0.03***	0.03***
	(1.65)	(1.72)	(1.38)	(1.58)	(2.56)	(2.87)
Nasdaq-listing	0.01	0.01	0.01	0.01	0.02	0.02
	(0.21)	(0.19)	(0.39)	(0.24)	(1.19)	(1.18)
Finance firm	−0.02***	−0.03***	−0.03***	−0.03***	−0.03**	−0.04**
	(−4.40)	(−4.31)	(−3.43)	(−3.36)	(−2.08)	(−2.03)
Percentage of shares held on filing date	0.01	0.01	0.01	0.01	0.01	0.01
	(0.10)	(0.37)	(0.38)	(0.02)	(1.17)	(0.87)
Call option	0.01	0.01	0.02	0.02	0.01	0.01
	(0.34)	(0.13)	(0.68)	(0.77)	(0.33)	(0.28)
Put option	0.02	0.02	0.03	0.03	0.04	0.03

(continued on next page)

Table 3 *(continued)*

	CAR(−1 + 1)		*CAR(−3 + 3)*		*CAR(−10 + 10)*	
	(0.57)	(0.67)	(0.79)	(0.69)	(0.74)	(0.64)
β_Y	Yes	No	Yes	No	Yes	No
β_I	Yes	No	Yes	No	Yes	No
$\beta_I \times \beta_Y$	No	Yes	No	Yes	No	Yes
Adjusted R^2	9.47	11.05	9.69	10.83	12.51	13.16

The table reports the regression coefficients, and the associated *t* statistics in parenthesis based on heteroskedasticity-consistent Hedge fund-clustered standard errors, of regressions explaining the announcement period abnormal market returns. The sample period is 2011–2014. *Most Active Hedge Funds* are those with at least 5 interventions in rolling windows of past 3 years. *Top Return Hedge Funds* are those with average 21-day announcement period abnormal returns (over and above the CRSP value-weighted index) of at least 10% and with at least 3 interventions in rolling windows of past 3 years. *Top Investor Hedge Funds* are those in the top 10 league tables based on aggregate investments in immediate past 3 year rolling windows, thus free of any look-ahead bias. Also reported are Adjusted R^2 values. Included in the regressions as controls are β_Y, a vector of year fixed effects, and β_I, a vector of bidder industry fixed effects based on the 10 Fama-French industry classifications. All variables are defined in Appendix A. *, **, and *** denotes significantly different from zero at the 10%, 5%, and 1% significance levels.

to-market ratios, as compared to other hedge funds. These results indicate that the *Top Investor Hedge Funds* chose better performing targets: those that were larger, more profitable and appeared to have better future prospects. They also invested in fewer Nasdaq-listed and finance firms than other hedge funds.

The announcement period abnormal market returns were significantly higher (at the 5% or 1% significance level) for *Top Investor Hedge Funds* than for other hedge funds, irrespective of the announcement period window, implying that during the "second wave" of activism the size of positions taken by *Top Investor Hedge Funds* was viewed positively by the market. *Top Investor Hedge Funds* also targeted a significantly lower proportion of finance firms as compared to other firms.

Thus, among the three alternative reputation measures we examined, the *Top Investor Hedge Funds* hedge funds had significantly higher announcement period stock market abnormal returns (as compared to other hedge funds) across all three windows of announcement periods we examined: 3 days, 7 days, and 21 days. In other words, during the "second wave" of activism, the market seemed to value activists with financial clout and expertise, perhaps because they were perceived to be best placed to create shareholder value in the firms they targeted. We next examine whether this result persists in a multivariate setting.

3.3. The top investor hedge funds

Table 3 examines the determinants of the announcement period abnormal market returns, using different specifications of the following regression:

$$\begin{aligned} CAR = {} & \boldsymbol{\beta_I} + \boldsymbol{\beta_Y} + \beta_1 \times \textit{Hedge Funds} + \beta_2 \times \text{Market Cap} + \\ & \beta_3 \times \text{ROA} + \beta_4 \times \text{Book to Market} + \beta_5 \times \text{Nasdaq-listing} + \beta_6 \times \text{Finance Firm} + \\ & \beta_7 \times \text{Percentage of Shares Held on Filing Date} + \\ & \beta_8 \times \text{Call Option} + \beta_9 \times \text{Put Option} + \varepsilon \end{aligned} \tag{1}$$

where *CAR* is either the 3-day value-weighted-market-adjusted abnormal announcement period stock return, *CAR (−1, +1)*, or the 7-day return, CAR (−3, +3), or the 21-day period return, *CAR (−10, +10)*, and *Hedge Funds* are *Most Active Hedge Funds*, those with at least 5 interventions in rolling windows of past 3 years, or *Top Return Hedge Funds,* those with average 21-day announcement period abnormal returns (over and above the CRSP value-weighted index) of at least 10% and with at least 3 interventions in rolling windows of past 3 years, or *Top Investor Hedge Funds*, those in the top 10 league tables based on aggregate investments in immediate past 3 year rolling windows, so as to be free of any look-ahead bias, β_Y is a vector of 7 year fixed effects, and β_I is a vector of 10 bidder industry fixed effects, based on Fama-French industry sectors. These fixed effects are used to capture any year- or industry-related common effects not specifically captured by the other explanatory variables.

It is possible that contemporaneous industry shocks can affect treatment effects. So, following Bernstein et al. (2016), we control for local shocks by including the full set of industry fixed effects interacted with year fixed effects, in an alternate specification of the above regression equation. That is, instead of β_I and β_Y, we use $\beta_I \times \beta_Y$ in this alternate specification. Thus, these fixed effects effectively control for endogeneity by either (1) controlling for industry and year shocks separately, or (2) controlling for contemporaneous industry shocks (again see Bernstein et al. (2016)). The explanatory variables and residuals from the above panel regression specification can be correlated within hedge funds. To correct for such hedge fund-specific correlations, we report *t*-statistics that are based on heteroskedasticity-consistent standard errors adjusted for hedge-fund clustering in all the regressions (see Petersen, 2009). The sample period over which the regression is run is 2011–2014, where the period 2008–2010 is used to construct the initial *Hedge Funds* reputation measures.

In Panel A, we find that across all specifications, *Most Active Hedge Fund* interventions are not significantly associated with announcement period stock returns. In Panel B, we find that *Top Return Hedge Funds* are not significantly associated with *CAR(−1,+1)*, but are significantly associated with a higher *CAR(−3,+3)* at the 10% significance level and with a higher *CAR(−10,+10)* at the 10% significance level (5% significance level if using interacted fixed effects controls). In Panel C, we find that *Top Investor Hedge Funds* are strongly associated with significantly higher announcement-period stock market reactions, across all the specifications examined, at the 5% significance level for *CAR(−1,+1)*, and at the 1% significance level for *CAR(−3,+3)* and *CAR(−10,+10)*.

All panels also show that the target firm market capitalization is significantly and negatively associated with announcement period market reaction, and investment by activists in finance firms is not associated with positive announcement returns. Target ROA is positively and significantly associated with announcement period market reaction, when we examine the 7-day returns; the target book-to-market ratio is positively and significantly associated with announcement period market reaction, when we examine longer-window returns. Overall, results indicate that market reaction during the "second wave" of activism was more positive when targets were not large, were not financial firms, and were currently profitable, but appeared to have worse future cash flow prospects.

Taken together, the results of Tables 2 and 3 show that frequent interventions definitely did *not* lead to superior stock market reaction during the "second wave" of activism. This result is similar to the grandstanding effect of VCs documented by Gompers (1996), where, in the case of hedge funds, the *Most Active Hedge Funds*, on average, take too many positions, and perhaps do not devote sufficient effort to each intervention, and therefore underperform. Furthermore, one of the key attributes of successful activist hedge funds is that they hold highly undiversified portfolios in order to concentrate their efforts on a few targets (Partnoy, 2015). These highly active funds are unlikely to be able to follow that model.

Past returns were weakly associated with superior market reaction during the "second wave" of activism, but only when measured over longer windows. Hedge funds are thought to have the ability to time stock picks across asset classes, which is why past returns may lead to a good reputation. However, Griffin and Xu (2009) find that, at least in the long-equity stock universe, this assertion is unfounded. They also find that hedge funds that perform well one year do not outperform in the next year as well. Furthermore, markets may have short memories and ask "what have you done for me lately?" (Frankle et al., 2015). If this is true, then hedge fund past returns records may fade quickly. Our findings on *Top Return Hedge Funds* are partially consistent with this evidence.

However, large investments were strongly associated with higher stock market reaction across all windows of measurement. *Top Investor Hedge Funds* seem to have more credible financial clout. Markets seem to like money managers that have a lot of "skin in the game" (Dasgupta and Piacentino, 2015). On the basis of our results thus far, we will focus on *Top Investor Hedge Funds* as our hedge fund reputation measure, henceforth.

We must also consider the possibility that our binary reputation measure might be better replaced by a continuous reputation measure. Table 4 reports the results when we examine *Top Investor Hedge Funds* market share, a continuous variable, rather than the binary *Top Investor Hedge Funds* reputation measure. *Top Investor Hedge Fund Market Share* is a measure of hedge fund market shares of aggregate investments in immediate past 3 year rolling windows. We use regression specification (1) with β_Y, a vector of year fixed effects, and β_I, a vector of bidder industry fixed effects, as the fixed effects controls. Two different variations are run, with and without the deal features – *Percentage of Shares Held on Filing Date*, *Call Option*, and *Put Option* – which may not be known at the time announcement period abnormal market reaction is determined.

We find that *Top Investor Hedge Funds* market share is significantly associated with higher 3-day abnormal announcement period return at the 5% level; with higher 7-day abnormal announcement period return at the 5% (10%) significance level in the shorter (longer) regression specification; and with higher 21-day abnormal announcement period return at the 10% significance

Table 4
Top investor hedge fund market share and market reaction.

	CAR(−1 + 1)		*CAR(−3 + 3)*		*CAR(−10 + 10)*	
Top investor hedge fund market share	0.11**	0.15**	0.15**	0.13*	0.15*	0.12
	(1.98)	(1.97)	(2.00)	(1.85)	(1.68)	(1.53)
Market cap	−0.01*	−0.01*	−0.01	−0.01	−0.01*	−0.01
	(−1.82)	(−1.67)	(−1.52)	(−1.22)	(−1.65)	(−1.38)
ROA	0.02	0.02	0.07***	0.07***	0.08	0.07
	(1.50)	(1.57)	(3.06)	(3.18)	(1.50)	(1.56)
Book to market	0.01*	0.01*	0.01	0.01	0.03*	0.03*
	(1.72)	(1.69)	(1.53)	(1.50)	(1.80)	(1.71)
Nasdaq-listing	0.01	0.01	0.01	0.01	0.02	0.01
	(0.17)	(0.12)	(0.16)	(0.07)	(0.89)	(0.85)
Finance firm	−0.03***	−0.03***	−0.04***	−0.03***	−0.04**	−0.04**
	(−4.45)	(−4.37)	(−3.76)	(−3.51)	(−2.41)	(−2.21)
Percentage of shares held on filing date		0.01		0.01		0.01
		(0.29)		(0.11)		(0.95)
Call option		0.01		0.02		0.02
		(0.19)		(0.78)		(0.35)
Put option		0.02		0.03		0.05
		(0.68)		(0.77)		(0.81)
$\beta_I \times \beta_Y$	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	10.09	9.33	9.62	9.46	9.72	9.27

The table reports the regression coefficients, and the associated *t* statistics in parenthesis based on heteroskedasticity-consistent Hedge fund-clustered standard errors, of regressions explaining the announcement period abnormal market returns. The sample period is 2011–2014. *Top Investor Hedge Fund Market Share* are hedge fund market shares of aggregate investments in immediate past 3 year rolling windows. Also reported are Adjusted R^2 values. Included in the regressions as controls are β_Y, a vector of year fixed effects, and β_I, a vector of bidder industry fixed effects based on the 10 Fama-French industry classifications. All variables are defined in Appendix A.

*, **, and *** denotes significantly different from zero at the 10%, 5%, and 1% significance levels.

level only in the shorter specification. The effects of other control variables on stock market returns are in line with those documented in the previous table. Accordingly, a continuous market share variable also is consistent with a conclusion that *Top Investor Hedge Funds* had higher announcement returns than other hedge funds during the "second wave" of activism, although the results are not as strong with a continuous market share variable as with a binary measure.

Although we control for target firm features, deal features, and fixed effects in the above regression specification, it is still possible that *Top Investor Hedge Funds* are associated with specific activism outcomes simply because they are associated with certain types of targeted firms, in which such outcomes are more likely. In other words, associations between hedge fund involvement and success can be complicated by a hedge fund's unobserved criteria for involvement in a target firm. To control for this form of selection bias, we employ 2 separate approaches. First, is the instrumental variables (IVs) simultaneous equations procedure, where *Top Investor Hedge Funds* is the endogenous covariate.

To be a valid IV, it should have the properties that while it strongly predicts the involvement of *Top Investor Hedge Funds* in activism events being examined, it should not be significantly associated with the outcomes of activism except through the *Top Investor Hedge Fund* itself. We use the 2-vector of Instrumental Variables (IVs) all taken from Activist Insight database - *Assets Under Management*, a hedge fund firm's total assets under management (in millions of dollars) as at the end of the year immediately preceding the year of announcement, and *Number of Portfolio Companies*, a hedge fund firm's number of firms in portfolio as at the end of the year immediately preceding the year of announcement, taken from *Activist Insight* database. These are the 2 proxies for the financial "clout and expertise" that enable *Top Investor Hedge Funds* to choose target firms, and thus facilitate the hedge fund-target firm matching process.

The *Activist Insight* hedge fund data spans the years 2010, 2011, 2012, 2013, and 2014. We link 2010 numbers from Activist Insight to the announcements made in 2011 to avoid any look-ahead bias. Likewise, we link 2011, 2012 and 2013 hedge-fund features with shareholder activism events in 2012, 2013 and 2014 respectively. We end up with 412 shareholder activism events over the period 2011–2014 with all IV data, for analysis.

Table 5
Top investor hedge funds and market reaction, after controlling for endogeneity using instrumental variables.

	CAR(−1 + 1)	*CAR(−3 + 3)*	*CAR(−10 + 10)*
Panel A			
Top investor hedge fund	0.04***	0.06***	0.14***
	(3.08)	(3.73)	(4.24)
Market cap	−0.01**	−0.01***	−0.01***
	(−2.36)	(−3.84)	(−3.48)
ROA	0.01	0.04	0.02
	(0.40)	(1.33)	(0.34)
Book to market	0.01	0.01	0.02
	(0.69)	(0.89)	(1.48)
Nasdaq-listing	0.01	0.01	0.03*
	(1.50)	(0.97)	(1.68)
Finance firm	−0.02***	−0.03***	−0.02**
	(−2.71)	(−3.17)	(−2.02)
β_Y	Yes	Yes	Yes
β_I	Yes	Yes	Yes
Adjusted R^2	10.74	10.40	11.83
Panel B			
Top investor hedge fund market share	0.20**	0.28*	0.34
	(2.03)	(1.87)	(1.57)
Market cap	−0.01	−0.01**	−0.01*
	(−1.31)	(−2.07)	(−1.65)
ROA	0.01	0.05	0.01
	(0.61)	(1.57)	(0.02)
Book to market	0.01	0.01	0.02
	(0.60)	(0.92)	(1.43)
Nasdaq-listing	0.01	0.01	0.03
	(1.52)	(0.94)	(1.42)
Finance firm	−0.02***	−0.03***	−0.02
	(−2.73)	(−3.26)	(−1.37)
β_Y	Yes	Yes	Yes
β_I	Yes	Yes	Yes
Pseudo/adjusted R^2	8.87	8.78	6.20

This table reports the regression coefficients, and the associated *t* statistics of regressions explaining the announcement period abnormal market returns employing instrumental variable simultaneous equations regression model using limited information maximum likelihood (LIML) estimation, where *Top Investor Hedge Funds* (in Panel A) and *Top Investor Hedge Fund Market Share* (in Panel B) determined without any look-ahead bias, are the endogenous covariates. The instrumental variables (IVs) are *Assets under Management,* and *Number of Portfolio Companies*. All hedge fund features are as of the year-end immediately prior to the intervention, so as to be free of any look-ahead bias. The sample period is 2011–2014. The first column shows the first stage regression estimates.
*, **, and *** denotes significantly different from zero at the 10%, 5%, and 1% significance levels.

Economically, the choice of these IVs is justified because the higher a hedge fund's total assets under management, the higher the probability of the hedge fund investing in the firms it wants, especially in taking a more than 5% stake in large capitalization target firms. An alternative measure of a hedge fund's clout and ability to invest is the number of firms in its portfolio. These two IVs satisfy the exclusion requirement because while a hedge fund's financial clout as measured by the amount of capital and number of firms invested in, at the time of announcement, facilitates the matching of hedge fund to a target firm, it does not directly ensure superior performance in its current investment, except through the hedge fund itself.

We examine the statistical validity of the instruments by performing over-identification tests (see, e.g., Krishnan et al., 2012, 2016). We find that *Top Investor Hedge Funds* is significantly and positively associated with both *Assets Under Management* and *Number of Portfolio Companies* at the 1% level. The *F*-statistic for the joint significance of both IVs for *Top Investor Hedge Funds* is above the critical value of 10 recommended by Staiger and Stock (1997). Thus, the set of IVs strongly predict a *Top Investor Hedge Fund* involvement with the target firm. However, the *Anderson-Rubin* test statistic for over-identification yields insignificant *p*-values for *CAR (−1 + 1)* and *CAR (−10 + 10)*, after controlling for other offer characteristics including *Top Investor Hedge Funds*. So we fail to reject the joint null that the IVs are uncorrelated with the error term, which supports excluding them from the second-stage equation. We conclude that our IVs satisfy the exclusion requirement of a valid instrument.

Table 5A reports results of instrumental variable simultaneous equations regression model over our full sample, using limited information maximum likelihood (LIML) estimation (see Juergens and Lindsey, 2009), where *Top Investor Hedge Funds* is the endogenous covariate. We use the shorter version of regression specification (1) without the deal features – *Percentage of Shares Held on Filing Date*, *Call Option*, and *Put Option* – which may not be known at the time announcement period abnormal market reaction is determined. Moreover, these three variables do not affect announcement period returns in any of the previous regressions. The positive associations of *Top Investor Hedge Funds* with higher stock market reactions, across all windows examined, are stronger than those reported in Table 3. All specifications also show that the target firm market capitalization and investment by activists in finance firms are significantly and negatively associated with announcement period market reaction. However, target firm's book-to-market ratio and target ROA are no longer significantly associated with announcement period market reaction.

Table 5B reports the results using *Top Investor Hedge Fund Market Share,* which is significantly associated with the 3-day abnormal announcement period return at the 5% level, with the 7-day abnormal announcement period return only at the 10% significance level, and not significantly associated with the 21-day abnormal announcement period return, somewhat consistent with, but definitely not stronger than, our findings in Table 4, once again showing that being a top activist matters in a binary fashion.

In an alternative method for controlling for endogeneity, following Brav et al. (2015a, 2015b), we ask the question: would the same market reaction have occurred at the target firms without top activists' involvement? This is the treatment effect. Specifically, we look for a matched target firm (associated with non-*Top Investor Hedge Funds*) of asset size and ROA within 10% of each of the targets of *Top Investor Hedge Funds*. If a match is not found using this threshold, we subsequently increase it until we find a match. We select total assets and ROA as our target-firm matching criteria because, as Table 2 shows, *Top Investor Hedge Funds* target firms that are significantly different from other activists' target firms on these two dimensions. This procedure determines an activist-target-firm match that did not receive an investment from a *Top Investor Hedge Fund,* but had similar features at the time of investment.

The sample on which this matching analysis is done is 108 activist investment events: 54 by *Top Investor Hedge Funds* and the remaining 54 by non-*Top Investor Hedge Funds*. The mean target-firm ROA for the matched sample is 5.1%, which is insignificantly different from that of the sample for *Top Investor Hedge Funds* target firms, 7% (see Table 2C). The mean target-firm total assets for the matched sample is $6.8 billion, which is insignificantly different from that of the sample for *Top Investor Hedge Funds* target

Table 6
Top investor hedge funds and market reaction, after controlling for endogeneity using matched target firms only.

	CAR(−1 + 1)	*CAR(−3 + 3)*	*CAR(−10 + 10)*
Top investor hedge fund	0.03**	0.06***	0.12***
	(2.04)	(2.86)	(3.19)
Market cap	−0.01**	−0.01***	−0.01***
	(−2.21)	(−3.08)	(−2.79)
ROA	0.02	0.01	0.33
	(0.24)	(0.11)	(1.22)
Book to market	0.01	0.01	0.04
	(0.20)	(0.46)	(1.06)
Nasdaq-listing	0.01	0.03*	0.03*
	(1.07)	(1.72)	(1.89)
Finance firm	−0.02*	−0.03**	−0.03**
	(−1.91)	(−1.98)	(−2.09)
β_Y	Yes	Yes	Yes
β_I	Yes	Yes	Yes
Adjusted R^2	10.13	12.10	12.65

This table reports the regression coefficients, and the associated *t* statistics of regressions explaining the announcement period abnormal market returns for *Top Investor Hedge Fund* with only target firms that are matched on the basis of ROA and Assets as at the intervention time. All hedge fund features are as of the year-end immediately prior to the intervention, so as to be free of any look-ahead bias. The sample period is 2011–2014.
*, **, and *** denotes significantly different from zero at the 10%, 5%, and 1% significance levels.

firms, $9.7 billion (see Table 2C). We run the shorter version of regression specification (1) on this sample of *Top Investor Hedge Fund* targets and the matched sample of non-*Top Investor Hedge Fund* targets including the time and industry fixed effects controls.

The results, reported in Table 6, are consistent with those reported in Table 5A. The involvement of *Top Investor Hedge Funds* during the "second wave" of activism was significantly associated with higher stock market reactions, at the 5% significance level for *CAR(−1,+1)* and 1% significance levels for *CAR(−3,+3)* and *CAR(−10,+10)*. All specifications also show that target firm market capitalization and investment by activists in finance firms were significantly and negatively associated with announcement period market reaction.

Thus, the presence of *Top Investor Hedge Funds* during the "second wave" of activism was significantly associated with superior announcement period stock returns after controlling for endogeneity using different techniques: interacted fixed effects, IV regression, and matched sample analysis.

3.4. Features of top investor hedge funds

What are the features of *Top Investor Hedge Funds?* Table 7 shows that, across all dimensions we examine, *Top Investor Hedge Funds* are larger, and have existed for longer than other hedge funds. One measure of a hedge fund's reputation for expertise is the number of top management personnel that it employs and the number of years it has existed. Both of these variables for *Top Investor Hedge Funds* are significantly higher than those for other hedge funds. The average dollar value of assets under management is three times higher for *Top Investor Hedge Funds* than for other hedge funds. Thus, *Top Investor Hedge Funds* have much larger internal pools of financial capital to invest in target firms than other hedge funds.

Top Investor Hedge Funds are also headquartered significantly more in New York than other hedge funds, even if they are incorporated elsewhere. The focus on New York appears to reflect the importance to hedge funds of their physical location, perhaps because of proximity to investors, media, top law firms, or other hedge funds. As we demonstrate below, *Top Investor Hedge Funds* make good use of their media connections.

3.5. Features of targets of top investor hedge funds

The literature on hedge fund activism has not focused on the effects of managerial entrenchment. There are several possible ways managerial entrenchment might matter to activists. First, some activists might avoid entrenched firms, because entrenchment makes it more difficult for an activist to succeed. Second, some activists might favor entrenched firms, because entrenchment creates good opportunities for an activist to create value by reducing shirking, empire-building, and extraction of private benefits by management. Third, entrenchment might not matter to activists in any statistically significant way. We run several tests to determine which of these hypotheses is most likely to hold for *Top Investor Hedge Funds*.

Bebchuk et al. (2009) calculate an entrenchment index based on six provisions: staggered boards, limits on shareholder bylaw amendments, poison pills, golden parachutes, supermajority voting requirements for mergers, and limits on charter amendments. We use *Investor Responsibility Research Center* (IRRC) data to examine the associations of these target firm features and our measures of hedge fund pedigree. We determine the presence or absence of each of the six IRRC provisions at each targeted firm as at the end of the year immediately preceding that of the shareholder activism announcement. We could find IRRC data for only 178 target firms from out of our sample of 947 different target firms. Table 8 reports univariate associations of these six anti-takeover provisions of targets with *Top Investor Hedge Funds*. Almost all of these entrenchment measures are more prevalent at firms targeted by *Top Investor Hedge Fund* targets than at firms targeted by other hedge funds, but, except for staggered board, they are not significantly more prevalent. However, when we aggregate these six entrenchment provisions into one entrenchment index (see Bebchuk et al. (2009)), we find that the *Top Investor Hedge Funds* target firms have significantly (at the 10% level) more entrenched management than do the targets of other hedge funds.

Finally, we use the *Shark Repellent* database to examine inside ownership of target firms in our sample, defined as the total percentage of common shares of the company owned by insiders or the company's Employee Stock Ownership Plan, as of the date of the 13D filings. We obtain this data for 306 firms in our sample. We find that the target firms of *Top Investor Hedge Funds* have almost a third (significantly lower) inside ownership as of the time of the 13D filing as compared to the target firms of other hedge funds. This might indicate a higher agency cost in the targets of the most reputed hedge funds (less "skin

Table 7
Top investor hedge funds features.

Average hedge firm features	Top investor hedge funds	Other hedge funds
Firm incorporated in NY state	72.72%	37.26%**
Firm age (years)	18.64	13.34*
Top management number	4.93	3.59*
Assets under management ($ billion)	13.8	4.1***

This table compares average firm features (averaged over all years of the sample period) of *Top Investor Hedge Funds*, based on the dollar amount of investments over our full sample period, with other Hedge Funds. Hedge Fund firm features are provided by Activist Insight Ltd. All variables are defined in Appendix A.
*, **, and *** denotes significantly different from the other cohort at the 10%, 5%, and 1% significance levels.

Table 8
Target firm management entrenchment features.

Target firm provision	Top investor hedge funds	Other hedge funds
	N = 53	N = 125
Staggered board	0.64	0.51*
Poison pill	0.40	0.33
Golden parachute	0.66	0.61
Limit on bylaw amendments	0.74	0.64
Supermajority requirement for mergers	0.42	0.46
Limits on charter amendments	0.70	0.62
Aggregate entrenchment measure	3.55	3.16*
Insider ownership (%)	5.06 (53)	13.80*** (253)

This table reports the associations between 6 anti-takeover provisions and *Top Investor Hedge Fund* and other hedge funds. The 6 provisions are: staggered boards, limits on shareholder bylaw amendments, poison pills, golden parachutes, supermajority voting requirements for mergers, and limits on charter amendments, taken from Investor Responsibility Research Center (IRRC) as of the end of the year immediately prior to the year of shareholder activism announcement. The proportions of firms having these provisions, targeted by each type of hedge fund, are shown. Also shown are average aggregate entrenchment measure, proportion of hostile activism events and post-activism acquisitions of firms, targeted by *Top Investor Hedge Fund* as compared with other hedge funds. Finally, the percentage inside ownership of target firms targeted by *Top Investor Hedge Fund* as compared with other hedge funds as at the date of the 13D filings, along with the number of target firms in parenthesis, taken from Shark Repellent database, is reported. The sample period is 2008–2014. Shown in parenthesis, where applicable, is the number of firms. All variables are defined in Appendix A.
*, **, and *** denotes significantly different from the other cohort at the 10%, 5%, and 1% significance levels.

in the game" for insiders) and hence a chance for operational improvements, and/or might indicate an already higher institutional interest in these firms.

Overall, these data support a conclusion that *Top Investor Hedge Funds* during the "second wave" of activism were more willing to intervene at targets with higher agency costs. This willingness is consistent with our findings that the market valued the intervention of these activists more highly during this time, in part because of their reputation for having the ability to intervene successfully in more difficult circumstances due to their financial clout and expertise.

3.6. Top investor hedge funds and post-activism performance of targets

Next we examine an important question that has been addressed by the literature on hedge fund activism with respect to the "first wave" of activism, but not the "second wave": how did the operating performances of target firms change from before the intervention to after the intervention? In Table 9A, we compare Return on Assets (ROA), Sales Revenue, and R&D investment growth from pre-announcement to post-announcement for *Top Investor Hedge Funds*, versus other hedge funds. ROA growth, Sales growth, and R&D investment growth rates are computed as the growth rate from the average of the 4 quarters immediately prior to the hedge fund intervention to the average of the 4 quarters immediately after intervention, for *Top Investor Hedge Funds* as compared with other hedge funds. There is a positive and statistically significant (at the 10% level) difference for all 3 measures between targets of *Top Investor Hedge Funds* and targets of all other hedge funds. Indeed, all 3 growth rates are negative for non-*Top Investor Hedge Fund* interventions. These values suggest that *Top Investor Hedge Funds* are better than other funds at stimulating an immediate operational performance improvement at the companies they target.

In Panel B, we compare the proportion of target firms that are delisted within five years of the hedge funds' initial announcement of their stake in the firm for *Top Investor Hedge Funds* and all other hedge funds. We examine two different types of delisting: delisting because of liquidation or being dropped (CRSP delisting codes of 400 and above) and delisting because of mergers and acquisition (CRSP delisting codes between 200 and 300). We report that the proportion of target firms delisted

Table 9
Post-top investor hedge fund intervention.

	Top Investor Hedge Funds	Other Hedge Funds
Panel A: post-intervention performance	N = 51	N = 396
ROA growth	9.24%	−4.74%*
Sales growth	2.54%	−3.00%*
R&D investment growth	3.42%	−0.47%*
Panel B: post-intervention delisting	N = 54	N = 427
Proportion acquired and delisted	16.67%	12.88%
Proportion liquidated/dropped and delisted	0.00%	4.68%**

Panel A compares the post-intervention ROA, Sales, and R&D Investment growth rate, computed as the growth rate from average ROA, Sales, and R&D Investment over the 4 quarters immediately prior to the hedge fund intervention to the averages over the 4 quarters immediately after intervention, for *Top Investor Hedge Funds* as compared with other hedge funds. Panel B reports target firm delisting proportions due to mergers and acquisitions or liquidations for *Top Investor Hedge Funds* as compared with other hedge funds. All variables are defined in Appendix A.
*, **, and *** denotes significantly different from the other cohort at the 10%, 5%, and 1% significance levels.

because of liquidation or being dropped is significantly higher for the non-*Top Investor Hedge Fund* interventions. Indeed, this proportion is zero for targets backed by *Top Investor Hedge Funds*.

The proportion of delistings because of mergers and acquisitions is also higher for targets invested in by *Top Investor Hedge Funds* than for targets invested in by other hedge funds, providing some evidence that the positive returns that all hedge funds generate for their investors are also potentially due to their ability to bring about sales of these target firms, consistent with Greenwood and Schor (2009).[7] However, this difference is not significantly different at the 10% level. However, keeping in mind the results of Table 6, to the extent target management entrenchment provisions reduce the likelihood that the target firm will be sold or otherwise reduce shareholder value, those reductions do not seem to matter substantially to the market reactions to the announcement of *Top Investor Hedge Fund* interventions, perhaps because the operating performance of target firms tend to improve.

Overall, univariate results suggest that top hedge fund activists generate superior returns both by improving operating performance as well as by increasing the probability of a later sale.

3.7. What do top hedge funds do?

In this final section, we seek explanations for the success of *Top Investor Hedge Funds*. The literature has alluded to some reasons for the apparent success of hedge fund activists, at least through 2007, which include potentially superior alignment of incentives for hedge fund managers, activists facing less serious political pressure, agency costs, and conflicts of interest than other investors (Partnoy, 2015), and reduction of excess cash at the hands of management (Boyson and Mooradian, 2011), perhaps through changes in firm's leverage, or payouts to shareholders (Brav et al., 2009). Our measure of hedge fund reputation is based on the "financial clout and expertise" line of research. How does this factor into *Top Investor Hedge Funds*' results for their interventions?

We first examine whether the long term debt ratio or payout ratio at targeted firms changed from the average over four quarters before intervention to the average over four quarters after intervention. Following Heider and Ljungqvist (2015), the long term debt ratio is defined as long-term debt over the book value of assets, and following Grullon and Michaely (2002), dividend payout ratio is defined as dividend on common stock over earnings before extraordinary items. Table 10A compares these two ratios for *Top Investor Hedge Funds* with those for the other hedge funds. We find that although these two ratios are indeed higher in the post intervention period for firms targeted by *Top Investor Hedge Funds*, these differences are not significant compared to those for firms targeted by other hedge funds. Thus, the positive market reaction to *Top Investor Hedge Funds* does not seem to be because of any significant anticipated changes in capital structure or dividend policy.

Krishnan et al. (2011) report that reputed venture capital firms remain shareholders and hold board positions even well into the post-IPO period, to continue to offer monitoring and guidance services to the portfolio firms. In a similar vein, we hypothesize that hedge funds with "financial clout and expertise" will seek to employ their expertise to gain board representation at firms where they intervene by all means available in order to implement their programs for change and to improve board monitoring. We anticipate that their efforts will begin with the announcement of the hedge fund's intervention and continue throughout their investment until they are successful.

Accordingly, we next examine the stated intent of hedge funds in their 13D filings, and their subsequent actions. In particular, we define *Director Replacement Intent* as an indicator variable that takes the value of 1 if the hedge fund intervention is with the stated objective (in the 13D) that includes language about replacing one or more directors, and 0 otherwise. The first row of Table 8B compares *Director Replacement Intent* for *Top Investor Hedge Funds* with those for the other hedge funds. We find that the number of targets with *Director Replacement Intent* is significantly higher for *Top Investor Hedge Funds* than for other hedge funds. That is, *Top Investor Hedge Funds* demonstrate greater board involvement intent at the time they disclose taking significant equity stakes in their targets.

To assess whether hedge funds follow up on their stated intent, we examine the numbers of *Proxy Fights Initiated*, defined as the number of proxy fights initiated by a hedge fund related to proposals for electing dissident's director nominee or removing extant directors; *Proxy Fight Won*, the number of successful proxy fights initiated by a hedge fund related to electing that dissident's director nominee or removing extant directors; *Lawsuits Initiated*, the number of lawsuits related to board representation, initiated by hedge funds, along with or without proxy fights; and *Lawsuits in Campaigns Resulting in Board Seats*, the number of lawsuits related to board representation that resulted in board seats won. All these data are from the *Shark Repellent* database.

The total number of proxy fights over directors initiated by the hedge funds involving the target firms in our sample period is 349, of which 79 proposals are by *Top Investors Hedge Funds*. Among the top activists, the maximum number of proxy contests involves Carl Icahn with 41 proxy contests and 11 wins. The total number of lawsuits related to board representation initiated by the hedge funds involving the target firms in our sample period is 98, of which 15 do not accompany proxy fights. Of these, 15 suits are by *Top Investors Hedge Funds*, of which is the maximum number again involves Carl Icahn with 6 lawsuits and 2 wins.

[7] Anecdotal evidence suggests that the hedge fund activists with the largest investments overall are associated more with efforts that would result in delisting because of mergers and acquisitions than efforts that would result in delisting because of liquidations and being dropped. For example, Bill Ackman's Pershing Square hired Stephen Fraidin, a veteran M&A lawyer of Kirkland and Ellis law firm (see *Wall Street Journal*, Jan. 20, 2015); and many activists have encouraged split-ups, such as Carl Icahn proposing the split-up of Ebay from PayPal, making both attractive acquisition targets (see *Wall Street Journal*, Jan. 22, 2015).

Table 10
What do top investor hedge funds do?

	Top investor hedge funds	Other hedge funds
	N = 51	N = 396
Panel A		
Long term debt ratio change	1.39%	0.36%
Dividend payout ratio change	4.00%	0.24%
Panel B		
Director replacement intent	38.63% (54)	19.58%*** (427)
Proxy fights initiated	15.8 (5)	4.58*** (59)
Proxy fight won	3.4 (5)	1.01*** (59)
Lawsuits initiated	2.5 (6)	1.31*** (63)
Lawsuits in campaigns resulting in board seats	1.33 (6)	0.46***(63)
Number of portfolio companies in which board seats held	1.64 (11)	0.60*** (125)
Popularity market share	6.72%	0.18%***

Panel A reports change in long term debt ratio and Payout ratios computed as the change from average numbers over the 4 quarters immediately prior to the hedge fund intervention to the averages over the 4 quarters immediately after intervention, and compares the average changes for the target firms of *Top Investor Hedge Funds* against that for other hedge funds. The first row of Panel B reports proportion of *Director Replacement Intent* as a stated objective in 13D filings, along with the number of target firms in parenthesis, for Top Investor hedge funds as compared with other hedge funds. The remaining rows report average hedge fund features: number of *Proxy Fights Initiated*, *Proxy fights Won*, *Lawsuits Initiated*, *Lawsuits campaigns Resulting in Board Seats*, *Number of Portfolio Companies in which Board Seats Held*, along with the number of hedge funds in parenthesis, and *Popularity Market Share*, the market share of media mentions in popular press in the past 3 year period, for *Top Investor Hedge Funds* as compared with other hedge funds. The sample period is 2008–2014. All variables are defined in Appendix A. *, **, and *** denotes significantly different from the other cohort at the 10%, 5%, and 1% significance levels.

Table 10B reports the average numbers per hedge fund of each of these activity measures. The results for *Top Investors Hedge Funds* are significantly higher for each of these activity measures. In fact, the number of proxy fights won (resulting in board representation) is almost three times as many per hedge fund for the *Top Investor Hedge Funds* as compared to the other hedge funds, as is the number of lawsuits won resulting in board representation for the *Top Investor Hedge Funds*. We also examine the number of portfolio companies in which a hedge fund holds at least one board seat as at the end of the years 2010–2014, taken from *Activist Insight* database, and find that this number is also almost three times as many for *Top Investor Hedge Funds* as compared to other hedge funds. All of these results suggest that during the "second wave" of activism *Top Investor Hedge Funds* were able to use their expertise to further their goals at target firms by gaining board positions.

We also collect the number of media entries for each hedge fund in our sample from the *Westlaw Next News* database each year. Hedge fund activists use the media as a platform for pressuring target boards of directors to capitulate to their demands by marshaling support from other shareholders. We use the immediate past 3-year rolling windows to construct the percentage of all media mentions for each activist, *Popularity Market Share*, each year in the period 2011–2014. For example, *Popularity Market Share* of a hedge fund in 2011 is the media mentions market share over the period 2008–2010. The last row of Table 8B shows that *Popularity Market Share* is significantly higher for *Top Investor Hedge Funds* as compared to other hedge funds. This result supports the claim that a top hedge activist's media presence may be an alternative route for pressuring target boards of directors to give in to their demands.

Indeed, could popularity itself be a hedge fund reputation measure? To examine this, we designate the top 10 hedge funds of the *Popularity Market Share* annual league tables as the *Most Popular Hedge Funds*. Eight activists are the *Most Popular Hedge Funds* every year from 2011 through 2014. They are, in order, Alden with an annual average of 6.03% all media mentions, Third Point with 5.98%, Silver Lake with 5.96%, David Stern with 3.99%, Equity One with 3.68%, Carl Icahn with 3.29%, David Russell with 3.07%, and Mark Cuban with 2.67%.

To test the independent importance of this variable, we compare the relation between *Most Popular Hedge Funds* and announcement period abnormal returns, with those for the other hedge funds. Appendix B reports that the 3-day market reactions to announcements of interventions are significantly higher for the *Most Popular Hedge Funds*, but only at the 10% significance level, relative to the remainder of the sample; the 7-day and 21-day returns are not. Accordingly, media popularity does not explain superior announcement period market reactions with as much statistical significance as the presence of *Top Investor Hedge Funds.* An additional issue, as Table A2 shows, is that several of the activists who are most often in the news do not seem to file 13Ds as often.

In sum, it appears that *Top Investor Hedge Funds* during the "second wave" of activism generated superior returns both by improving operating performance and by gaining board seats to implement their plans. Their presence also was associated with an increased probability of a later sale and a greater likelihood of active monitoring and discipline of firm management, especially at targets with greater entrenchment and higher agency costs.

Brav et al. (2015a, 2015b) state that, "It is hard to argue that activists would willingly hold undiversified positions and be subject to costly engagements (Gantchev, 2013), which typically evolve into shareholder proposals and proxy contests, if these were not necessary means to achieve their goals." We find that *Top Investor Hedge Funds* in fact launch successful proxy fights, file and win lawsuits, pressure target boards through the media, overcome strong anti-takeover defenses, and replace board members. Hence, the market reacts positively to their involvement. In short, we provide evidence for the success, in terms of market

reaction, of what Denes et al. (2015) term "high cost activism" that entails amassing large ownership stakes and conducting proxy fights for board seats.

4. Conclusion

We document several important results regarding recent hedge fund activism. Contrary to some earlier evidence, we show that the positive announcement returns of activists, which have been documented in the literature through 2007, continued during the "second wave" of activism from 2008 to 2014.

What was the source of these extraordinary market returns? To investigate that question, we explore the extent to which announcement returns varied based on the activists' reputations. Specifically, we examine three measures of hedge fund reputation, based on (1) frequency of intervention, (2) past success in terms of market reactions, and (3) financial clout and expertise.

We find that interventions by those hedge fund activists that engaged most frequently were associated with the lowest announcement period returns. Interventions by activists with past success were associated with higher announcement period returns. However, the interventions with the highest returns were by activists in our third category: *Top Investor Hedge Funds*, those funds with the greatest aggregate dollar investments indicating financial clout. These results suggest that the most successful activists, in terms of market reaction, are those with the capacity and willingness to engage in the largest, most difficult interventions.

The *Top Investor Hedge Funds* during the "second wave" of hedge fund activism had greater financial clout: they had existed for longer than other activists and had significantly larger assets under management. They also had greater expertise: they had a greater ability to force board changes at the firms they target. *Top Investor Hedge Funds* specifically stated an intent to replace directors, were more involved in proxy fights and lawsuits, and won three times as many proxy fights and lawsuits as other activists. They also targeted more entrenched firms indicating higher agency costs, but, nevertheless, were more successful in gaining board seats, and implementing changes after intervening, improving operating performance.

Appendix A. Definitions of variables

Hedge fund variables	Description
Most active hedge funds	An indicator variable for the most active hedge funds, that takes the value of 1 for those with at least 5 interventions during the most recent previous 3-year period, and 0 otherwise. That is, *Most Active Hedge Funds* in 2011 are those with at least 5 interventions during this period: 2008–2010.
Top investor hedge funds	An indicator variable that takes the value of 1 for hedge funds that are in the top 10 league table of aggregate dollar investments during the most recent previous 3-year period, and 0 otherwise.
Top investor hedge fund market share	Hedge fund market shares of aggregate investments in immediate past 3 year rolling windows.
Top return hedge funds	An indicator variable that takes the value of 1 for hedge funds with an average 21-day announcement period abnormal returns of at least 10% and with at least 3 interventions in rolling windows of past 3 years, and 0 otherwise.
Most popular hedge funds	An indicator variable that takes the value of 1 for hedge funds that are in the top 10 annual league tables based on market share of number of entries in the Westlaw Next News media database during the most recent previous 3-year period, and 0 otherwise.
Firm age	The age of the Hedge fund firm computed from the year of incorporation to the year of announcement, taken from Activist Insight database.
Top management number	The number of top management personnel including Chairman, vice-chairman, CEO, COO, CFO and Directors, for each of the years for the years 2010–2014, taken from Activist Insight database.
Number of portfolio companies in which board seats held	The number of portfolio companies in which the hedge fund holds at least 1 board seat as at the end of the years 2010–2014, taken from Activist Insight database.
Assets under management	The hedge fund firm's total assets under management (in millions of dollars) as at the end of each of the years 2010–2014, taken from Activist Insight database. Used as an Instrumental Variable (IV).
Number of portfolio companies	The hedge fund firm's number of firms in portfolio as at the end of each of the years 2010–2014, taken from Activist Insight database. Used as an Instrumental Variable (IV).
Popularity market share	The percentage share of all popular media mentions for each hedge fund, in the immediate past 3-year rolling windows, collected from the Westlaw Next News database.
Target Firm Features	**Description**
ROA	Return on Assets, computed as net income divided by total assets, as at the end of the quarter immediately preceding the announcement date. The quarterly Compustat financial statement database is the source for both Net Income (item *69*) and Total Assets (item *44*). ROA is winsorized at the 1% and 99% levels, to mitigate the effect of outliers.
Market cap	The market value of equity, as at the end of the quarter immediately preceding the announcement date. The market value of equity is defined as the number of shares outstanding multiplied by the end of quarter closing stock price, which are respectively data items, *61* and *14* in the Compustat quarterly financial statement database. MVE is winsorized at the 1% and 99% levels, to mitigate the effect of outliers.
Book to market	The book to market ratio, as at the end of the quarter immediately preceding the announcement date. The book value of equity is defined as stockholders' equity plus balance sheet deferred taxes and investment tax credit, minus book value of preferred stock, which are respectively data items *60*, *52*, and *55* in Compustat's quarterly financial statement database. The market value of equity is defined as the number of shares outstanding multiplied by the end of quarter

(continued)

Target Firm Features	Description
	closing stock price, which are respectively data items, *61* and *14* in the Compustat quarterly financial statement database. Book-to-Market is winsorized at the 1% and 99% levels, to mitigate the effect of outliers.
Nasdaq listing	An indicator variable that takes the value of 1 for target firm that is listed on Nasdaq, and 0 otherwise.
Finance firm	An indicator variable that takes the value of 1 for target firms that have SIC codes 60–67, and 0 otherwise.
Inside ownership	Percentage of common shares of the target company owned by insiders at the company, or the company's Employee Stock Ownership Plan.
CAR$(-1 + 1)$	The 3-day announcement period abnormal stock return, over and above the Value-weighted CRSP index return, from 1 day before the announcement date to 1 day after.
CAR$(-3 + 3)$	The 7-day announcement period abnormal stock return, over and above the Value-weighted CRSP index return, from 3 days before the announcement date to 3 days after.
CAR$(-10 + 10)$	The 21-day announcement period abnormal stock return, over and above the Value-weighted CRSP index return, from 10 days before the announcement date to 10 days after.
ROA growth	Percentage growth in ROA of the Target firm computed as the growth rate of average ROA for the 4 quarters immediately pre-intervention, to the average for the 4 quarters immediately post-intervention.
Sales growth	Percentage growth in Sales Revenue of the Target firm computed as the growth rate of average Sales for the 4 quarters immediately pre-intervention, to the average for the 4 quarters immediately post-intervention.
R&D investment growth	Percentage growth in R&D expenses of the Target firm computed as the growth rate of average R&D expenses for the 4 quarters immediately pre-intervention, to the average for the 4 quarters immediately post-intervention.
Proportion acquired and delisted	Proportion of Target firms Acquired and delisted (CRSP delisting code between 200 and 300) within 5 years post-announcement
Proportion liquidated/dropped and delisted	Proportion of Target firms liquidated or dropped and delisted (CRSP delisting code of more than 400) within 5 years post- announcement.
Long term debt ratio change	Computed as the change in average long-term debt over the book value of assets for the 4 quarters immediately pre-intervention, to the average for the 4 quarters immediately post-intervention.
Dividend payout ratio change	Computed as the change in average dividend payout over income before extraordinary items for the 4 quarters immediately pre-intervention, to the average for the 4 quarters immediately post-intervention.
Intervention features	Description
Percentage of shares held on filing date	The proportion of total shares outstanding held by the hedge fund, as of the announcement date.
Call option	An indicator variable that takes the value of 1 if the hedge fund is mentioned as holding call options, as of the announcement date, and 0 otherwise.
Put option	An indicator variable that takes the value of 1 if the hedge fund is mentioned as holding put options, as of the announcement date, and 0 otherwise.
Director replacement intent	An indicator variable that takes the value of 1 if the hedge fund intervention is with the stated objective that includes language about replacing one or more directors, and 0 otherwise.
Proxy fights initiated	The number of proxy fights initiated by a hedge fund related to proposals on Electing Dissident's Director Nominee or removing extant Directors, taken from the *Shark Repellent* database.
Proxy fight won	The number of proxy fights initiated by a hedge fund related to proposals on Electing Dissident's Director Nominee or removing extant Directors that passed, taken from the *Shark Repellent* database.
Lawsuits initiated	The number of lawsuits related to board representation, initiated by hedge funds, along with or without proxy fights, taken from the *Shark Repellent* database.
Lawsuits in campaigns resulting in board seats	The number of lawsuits related to board representation that result in board seats won, taken from the *Shark Repellent* database.
Management entrenchment provisions	Description
Staggered board	An indicator variable that takes the value of 1 for firms with staggered boards as at the end of the year immediately before the activism event, and 0 otherwise, taken from Investor Responsibility Research Center database.
Poison pill	An indicator variable that takes the value of 1 for firms with poison pill provision as at the end of the year immediately before the activism event, and 0 otherwise, taken from Investor Responsibility Research Center database.
Golden parachute	An indicator variable that takes the value of 1 for firms with golden parachute provision as at the end of the year immediately before the activism event, and 0 otherwise, taken from Investor Responsibility Research Center database.
Limit on bylaw amendments	An indicator variable that takes the value of 1 for firms with this provision as at the end of the year immediately before the activism event, and 0 otherwise, taken from Investor Responsibility Research Center database.
Supermajority requirement for mergers	An indicator variable that takes the value of 1 for firms with this provision as at the end of the year immediately before the activism event, and 0 otherwise, taken from Investor Responsibility Research Center database.
Limits on charter amendments	An indicator variable that takes the value of 1 for firms with this provision as at the end of the year immediately before the activism event, and 0 otherwise, taken from Investor Responsibility Research Center database.
Aggregate entrenchment measure	The aggregate of all the above 6 indicator variables, that measures how the extent of a firm's management entrenchment.

Appendix B. Alternate hedge fund reputation and market reaction

Feature	Most popular hedge funds N = 18	Other hedge funds N = 463
Average CAR(−1 + 1)	5.72%	3.07%*
Average CAR(−3 + 3)	5.20%	3.77%
Average CAR(−10 + 10)	8.06%	7.22%

This table reports the average announcement period abnormal market returns associated with the reputed Hedge fund interventions, compared to those of other hedge fund interventions. Reputed hedge funds are defined as *Most Popular Hedge Funds*. The sample period is 2011–2014. All variables are defined in Appendix A above.

*, **, and *** denotes significantly different from the other cohort at the 10%, 5%, and 1% significance levels.

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