

## Hedge Fund Activists and Share Repurchases

Jon Handy

Indiana University - Bloomington, USA

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This paper documents a general decrease in the quality of open-market repurchase (OMR) timing within firms targeted by hedge fund activist investors. Prior to their being targeted, firms repurchased less often and did so at prices closer to the quarterly low stock price. Upon filing the SEC form 13D, not only does the average repurchase size increase, but the repurchases are made at prices significantly higher than both the quarterly low stock price and the quarterly average closing stock price. Despite this fact, there still exist positive abnormal returns following the OMR announcement, thereby suggesting that investors agree that company payout is too low. Taken together, these results suggest that as activist hedge funds increase repurchase pressure, repurchase quality decreases, potentially harming shareholders.

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### 1. Introduction

“It doesn’t suffice to say that repurchases are being made to offset the dilution from stock issuances or simply because a company has excess cash. Continuing shareholders are hurt unless shares are purchased below intrinsic value.”

Warren Buffett, CEO Berkshire Hathaway Inc.

2011 Letter to Shareholders

The general conclusion regarding hedge fund activist shareholders is that they improve the companies they target. Brav, Jiang, and Kim (2009) survey and review existing literature and, after reevaluating possible value creation sources, conclude that hedge fund activists successfully increase their targets’ shareholder value. These activists, by identifying companies with seemingly substandard corporate policies, purchasing and maintaining a large stock position within the company, and presumably correcting these value-diminishing policies, appear to increase future short-term and long-term stock prices.

However, disagreement exists and the question still remains, do hedge funds activists create value for shareholders? For example, Greenwood and Schor (2009) argue that the eventual takeover by a third party drives increased shareholder returns, not the activists themselves. After analyzing the announcement and long-run abnormal returns of activist targeted companies, they find that only acquired targets exhibit significant positive returns—abnormal returns for independent

targets remain undetectably different from zero. Regarding bondholders, Klein and Zur (2011) argue that hedge fund activism significantly reduces bondholders' wealth and expropriates wealth from bondholders to shareholders. They observe that the average excess bond return during the year following the initial 13D filing decreases by more than 8%. Additionally, almost one-third of targeted companies see a credit rating decrease. Despite these findings, the answer to the earlier posed question is still quite open. This paper aims to shine further light on the situation and proposes that while hedge fund activism may result in a net value creation, at best, bad repurchasing decisions mitigate the gains and at worst, may potentially harm shareholders. This mitigation is a result of activists pressing targets to return cash to shareholders via open market repurchases (OMRs) that are made at prices that are too high.

The inherent flexibility of OMRs has made them an increasingly popular cash dispersion method among today's corporations. In comparison, more traditional, though still popular, dividend payments are an inherently less flexible payout method. For example, once a dividend is announced, a company is legally obliged to pay the dividend. In comparison, repurchase announcements do not necessitate an actual repurchase. Additionally, while investors and management prefer consistent dividends that are nominally increasing over time, repurchases need not be consistent or follow any particular pattern at all. This inherent flexibility within OMRs allows managers to essentially time their repurchases. By repurchasing during times of stock price undervaluation, henceforth referred to as a quality repurchase, managers essentially invest in themselves at a cheaper price, thereby transferring wealth from selling shareholders to continuing shareholders. However, this flexibility has an inherent risk; namely, that managers can repurchase during overvaluation periods or when the price is too high, henceforth referred to as a poor or low quality repurchase. As the above quote by Warren Buffett suggests, repurchasing overvalued stock results in a transfer of wealth from continuing shareholders to selling shareholders because valuable capital is wasted on assets worth less than the purchasing price. In other words, repurchasing at higher prices is bad for investors when management could have otherwise repurchased at lower prices.

The inspiration underlying the hypothesis that hedge fund activism reduces OMR quality stems from a consistent finding in the hedge fund activism literature: targeted companies tend to pay out too little cash to investors, and activist hedge funds often state increased cash payout as a top priority. To understand the motivation behind this paper, consider the extreme example of a company that repurchases every time its stock is undervalued and does so until the undervaluation disappears. To the extent that investors correctly establish market prices and can quickly correct any seeming mispricing, a company that repurchases only when its stock is undervalued should do so relatively infrequently. Add the presence of an activist investor who pressures the company to increase its cash payout through

increased repurchases and the resulting decrease in OMR quality should become clear. The hedge fund activist pressures the company to now repurchase more often, increasing the probability that repurchases are made during overvaluation periods and, in turn, harms remaining shareholders.

Additionally, the argument could be made that even if targeted companies do not repurchase more often, simply purchasing more shares during any given undervaluation period could also harm shareholders. Repurchasing shares during undervaluation periods (and simply in general) typically increases the company's prevailing stock price. As undervalued shares are purchased from selling investors, repurchasers must pay retaining shareholders who place a higher value on retaining their shares' higher prices to prompt the transaction. As repurchasing continues, eventually the price paid is no longer less than intrinsic value, and further repurchases harm shareholders.

To gauge activist-targeted company repurchase quality, this study relies upon a hand-collected sample of 2,685 hedge fund activist attempts focusing on 1,139 targets from 1994–2011 and gathers actual OMR repurchase data, including the average quarterly repurchase price and the number of shares repurchased from Standard and Poor's Compustat database. By comparing the targets' repurchases to the remaining Compustat firms' repurchases, both before and after the initial targeting, this paper is the first in-depth analysis on how hedge fund activism affects open market repurchase quality.

The study begins by confirming that activist hedge fund targets do hold larger cash amounts than their non-targeted peers, relative to firm size, and that they repurchase fewer shares. Such a confirmation is necessary due largely to the fact that historically used repurchase data sources have been shown to be biased, at best, and largely inaccurate, at worst (Banyi and Kahle, 2008). Fortunately, legislation occurring in 2004 by the Securities and Exchange Commission amended SEC Rule 10b-18 and required firms to begin reporting detailed information regarding their repurchase activity within their quarterly financial reports. Rather than rely upon costly hand-collection of monthly repurchase data from company 10-Q and 10-K filings this study utilizes the Compustat CSHOPQ and PRCRAQ fields, populated beginning in 2004 using SEC filing data.

The remaining analysis explores how the repurchasing behavior of targeted firms changes post-targeting and whether or not the repurchases are made at systematically higher prices. The results confirm the hypothesis: there is a marked change in target repurchasing behavior after targeting and repurchasing prices notably increase. A company looking to boost cash payout using increased OMRs can do so either by increasing the number of shares it buys back during a particular transaction or by performing more repurchase transactions. Regression analysis of both the general propensity to repurchase and the average repurchase size suggests that target repurchasing behavior is related to company size. Though both smaller and larger targets repurchase increased stock amounts during any given transaction,

the larger targets do so at a decreasing rate and perform more repurchases. This is an interesting observation: under the assumption that larger firms have greater investor scrutiny, increased investment demand by institutional investors, and perhaps less volatile fundamentals (e.g., earnings, etc.), one would expect undervaluation periods to be even less likely.

Regarding repurchase quality, the results largely support the initial hypothesis — the evidence suggests that targets repurchase at systematically higher prices after the initial 13D filing date. To gauge repurchase quality, the average quarterly repurchase price (Compustat PRCRAQ) is initially compared to three difference price benchmarks: the within-quarter average daily closing stock price, the within-quarter low stock price, and the within-quarter median stock price. In the event that the average repurchase price is greater than these benchmarks, a repurchase is said to have been made at a price that is too high because the repurchases could have otherwise been made at a lower price. The greater the discrepancy, the lower the repurchasing quality. This study focuses largely on the quarterly low price benchmark as its main point of comparison. Ideally, all repurchases would be made as close to this price as possible. After being targeted by activist hedge funds, companies on average overpay by approximately two percent compared to the quarterly low stock price. This premium diminishes when using the average (median) stock price benchmarks, but is still statistically significant.

It can be argued, however, that such benchmarks are unfair. It should stand to reason that if an activist hedge fund believes its actions will improve future company stock price, then any repurchases made immediately after the initial targeting should be purchased at a price lower than the future stock price. That is, perhaps repurchases are future-looking, thereby leading any given target manager to say, "Compared to future stock prices our average repurchase price is quite low." To account for such an argument, this study compares quarterly average repurchase prices to the following quarter's equivalent pricing benchmarks. To differentiate from earlier analyses any resulting discrepancy is henceforth referred to as repurchase profitability as opposed to repurchase quality. That is, repurchases made at prices below the future quarter's benchmark are profitable repurchases and those purchased at higher prices are unprofitable. The results are consistent with initial suspicions and are highly intuitive. For example, there is evidence suggesting that activists do provide short-term increases in shareholder value. For example, focusing specifically on repurchases made within the same quarter as the initial hedge-fund results in repurchases made at substantial discounts to the following quarter's low price benchmark, increases are slightly upwards of eight percent on average. However, looking at repurchases made after the initial activism quarter there exist significant buyback premiums, upwards of three percent on both the average price benchmark and the low price benchmark. Consistently repurchasing at such high prices should quickly overshadow any gains from the initial discount paid in the initial activism quarter.

Despite these findings, analyzing abnormal returns surrounding repurchase announcements suggests that the market reacts more positively to repurchases announced by targeted companies, thereby strengthening the argument that targeted companies seemingly pay out too little cash. Specifically, factor model analysis of returns (Carhartt 4-factors) suggests that both activist targeted firms and non-targeted firms experience positive abnormal returns following repurchase announcements, however activist targets experience a significantly higher (upwards of 1%) cumulative abnormal return over the five days following the announcement. Such a trend continues for the next 30 days, however the results are statistically insignificant. The abnormal return increase is further supported by additional multivariate analysis.

This paper is related most directly to the literature on activist hedge fund investing. To this point the literature has largely addressed two major questions: Who do hedge fund activists target? Do hedge fund activists create value for their shareholders? Brav, Jiang, and Kim (2009) provide a comprehensive review of the literature on hedge fund targets. Brav, Jian, Partnoy, and Thomas (2008a) provide, perhaps, the backbone for much of the hedge fund activism literature. Within their paper they focus on who hedge funds target, how they correct the targets' perceived inefficiencies, and how the market reacts to their activism. Klein and Zur (2009) answer similar questions in regard specifically to confrontational hedge fund activist events. Both studies suggest increased stock returns associated with hedge fund activism. Brav et al. (2008a, 2008b), henceforth BJPT, suggest that activist investment improves firm value by up to 7% in the short-term with no reversal over the following year. Boyson and Mooradian (2007) offer further evidence that activist hedge funds benefit shareholders in both the short and long term, and find that aggressive activists are most responsible for any dramatic value increases. Clifford (2008) compares passive versus active hedge fund investors, and finds that increased returns are associated more with active hedge fund investors. Most recently, Bebchuck, Brav, and Jiang (2013) further support earlier findings by suggesting no evidence of long-run abnormal return reversal post activist attempts. Katelouzou (2013) shows similar results for international hedge fund activists. Gantchev and Jotikasthira (2013) show that increased sales by non-activist institutional investors needing liquidity significantly increase the probability that a firm will be targeted by a hedge fund activist. Chen, Huang, Li, and Stanfield (2012) provide evidence that hedge fund activists add value by improving company tax avoidance policies, especially when targeted by funds with prior experience. Jian, Li, and Wang (2012) show that hedge funds are highly prevalent in the chapter 11 bankruptcy procedure and that chapter 11 firms can much more successfully survive bankruptcy when supported by an activist hedge fund.

As evidenced by a recent commentary from *The Wall Street Journal* (Partnoy, 2015), there is strong controversy outside the academic realms regarding whether hedge fund activists create value for shareholders. Some critics suggest that "hedge

funds destroy companies by pushing them to load up with debt, lay off employees, slash research and development, and pump up short-term dividends and profits.” Academic research that disagrees with the general finding that activists increase firm value does exist. For example, Greenwood and Schor (2009) argue that a company’s eventual takeover by a third party is responsible for increased stock value, not the activists themselves. Additionally, Klein and Zur (2011) find that activist attempts benefit shareholders while costing existing bondholders. They document that around the time of the initial 13D filing the average excess bond return is -3.9% with an additional -4.5% occurring over the remaining year. This study provides another possible criticism: hedge fund activists appear to increase OMRs and do so at prices that are too high, thereby potentially harming shareholders.

This paper is also related to literature on the motivations for corporate share repurchases and how well firms repurchase. Cook, Krigman, and Leach (2004) provide evidence that market timing plays an important role in the repurchasing decision and that repurchases contribute to market liquidity. Ikenberry, Lakonishok, and Vermaelen (2000) and McNally, Smith, and Barnes (2006) suggest similar results for Canadian firms. Brockman and Chung (2001) suggest that, though managers tend to time their repurchases well, their repurchases decrease market liquidity. Bonaimé and Ryngaert (2013) analyze whether or not corporate insiders trade personal company stock in the same direction as company repurchases and conclude that stock repurchases occur most frequently when insiders are selling stock. De Cesari, Espenlaub, Khurshed, and Simkovic (2012) suggest that firms repurchase at relatively low prices, saving them on average 0.25% of the company’s market capitalization, and that institutional ownership reduces the gains from company open-market repurchases. Ben-Rephael, Oded, and Wohl (2013) suggest that the timing quality of repurchases is negatively related to firm size and positively related to market-to-book ratio. Finally, Chen and Wang (2012) analyze the impact financial constraints impose upon repurchasing firms and find that those firms that repurchase while they are financially constrained have poorer post-buyback abnormal returns and operating performance than firms repurchasing while they are less financially constrained. This study uses market timing as the foundational impetus for repurchasing, and analyzes whether or not additional pressures to repurchase, namely from hedge fund activists, decrease repurchase quality.

Lastly, this paper relates to repurchase literature focusing on the market returns to repurchase announcements. Chan, Ikenberry, Lee, and Wang (2010) investigate whether repurchase announcements are used to mislead investors and find few instances of such cases yielding any long-run economic benefits. In a similar study, Bonaimé (2012) analyzes the completion rates of announced repurchase plans and finds that those firms that complete prior repurchase plans tend to have higher post-announcement market returns, implying a possible reputational effect. If the proposal that activist targeted firms hold large excess cash levels is true, then target repurchase announcements should be met with favorable market reactions. As such,

this paper analyzes OMR announcement reactions to gauge investor sentiment regarding such decisions.

## **2. Data and Methodology**

The data used in this paper results from the merging of two primary datasets: a large, hand-collected data set comprising hedge fund activist events from 1994–2011 and the set of quarterly actual repurchases from 2004–2012 as taken from Standard and Poor's Compustat. I thank Dr. Alon Brav and his research team for allowing me the use of his hedge fund activist dataset and briefly describe their data collection process below. In regard to the repurchasing data, I provide much greater detail regarding the collection process and how it differs from other prevailing collection methods. All quarterly financial data is taken from Standard and Poor's Compustat and all stock information, including price, shares outstanding, and trade volume are taken from CRSP.

### **2.1 Hedge Fund Activism Dataset**

Due to the absence of any centralized activist hedge fund dataset, BJPT (2008) hand-collected an initial hedge fund activist dataset based largely on Schedule 13D filings, a mandatory filing requirement resulting from the 1934 Exchange Act. All firms acquiring more than 5% of a public firm's securities (any class) are required by law to file this document with the SEC no later than 10 days after the acquisition. Of particular importance to researchers is the fact that the 13D filings require acquiring investors to explain why the investor acquired the securities, particularly if the investor's intentions include future mergers and acquisition activity, liquidation of the firm's assets, change to corporate capital structure or dividend policy, and other general corporate changes. By analyzing the Schedule 13D and other outside news sources (e.g., Factiva), BJPT have compiled a dataset of hedge fund activist attempts over the years 1994–2011. This dataset includes basic identifier data including: Compustat GVKEY, CRSP PERMNO, Cusip, and fund and company name for both the targeting hedge funds and the targeted corporations. From the Schedule 13Ds and Factiva searches, BJPT gather important information including the date of the first activist attempt, the date the firm ends its activist position, the various goals activists seek to achieve, and the tactics they use to achieve them. The most popular method to achieve stated goals is "the hedge fund intends to communicate with the board/management on a regular basis with the goal of enhancing shareholder value." Hedge fund activist methods can be highly aggressive or hostile to firm management. A hostile activist attempt is defined as an attempt where the activist threatens the firm with a proxy vote, potential takeover, or legal action (sue), whether they actually do so or not.

Table 1: Company Summary Statistics – Quarterly

<b>Non-Targeted Firm</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
VARIABLES	N	Mean	Std. Dev.	Min	Max	t-score
Total Assets	94,587	3,259.00	20,268.00	0.00	846,988.00	
Cash	94,583	369.30	2,211.00	-0.02	91,386.00	
Common Shares Repurchased	95,228	0.72	5.86	0.00	297.80	
Total Liabilities	94,533	2,005.00	15,938.00	0.00	719,808.00	
Net Income	94,436	45.51	436.70	-3,896.00	15,910.00	
Average Repurchase Price	41,480	19.49	45.19	0.00	2,296.00	
Total Sales	94,477	756.90	3,790.00	-197.00	124,238.00	
Market Cap.	70,685	3,773.00	17,760.00	0.00	626,550.00	
Average Stock Price	93,107	21.37	43.58	0.03	2,432.00	
Shares Outstanding	93,686	110,126.00	446,790.00	12.52	10,900,000.00	
Firm Age (Quarters)	95,228	248.00	191.90	0.00	1,044.00	
<b>Targeted Firms</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>
Total Assets	14,559	1,224.00	3,537.00	2.07	49,579.00	12.09***
Cash	14,559	151.10	560.70	0.00	15,640.00	11.85***
Common Shares Repurchased	14,601	0.297	2.20	0.00	121.40	8.71***
Total Liabilities	14,550	737.60	2,225.00	0.14	33,227.00	9.57***
Net Income	14,539	7.42	180.90	-13,85.00	7,699.00	10.37***
Average Repurchase Price	6,460	12.99	19.85	0.00	403.70	11.39***
Total Sales	14,550	281.30	888.10	-827.00	21,288.00	15.07***
Market Cap.	11,059	1,135.00	3,637.00	0.86	60,438.00	15.56***
Average Stock Price	14,360	15.66	18.60	0.04	422.80	15.48***
Shares Outstanding	14,436	57,033.00	141,670.00	765.00	2,490,000.00	14.16***
Firm Age (Quarters)	14,601	247.80	191.10	5.00	1,044.00	0.10

Notes: This table presents quarterly summary statistics on various corporate accounting descriptors. Columns (1)–(5) focus on quarters occurring either before an activist targeting or on quarters where no activist attempt has been made. Columns (6)–(10) focus on the quarters occurring after a firm has been targeted by a hedge fund activist. Only targeted firms appear in this sample. Column (11) tests the difference in means. All accounting data has been taken off Standard & Poor's Compustat and stock price data was gathered from Center for Research in Security Prices (CRSP).



The initial activist dataset has 2,685 activist attempts focusing on 1,139 targets (some firms are targeted by multiple hedge funds). In order to accurately gauge the repurchase behavior of firms before being targeted, this study requires two years of repurchase history before being targeted. As such, only firms being targeted after January 1, 2006, are included as activist firms. Those firms that are targeted before 2006 are still included in the sample, but not flagged as activist targeted firms – this should bias the paper against finding a significant difference between the two groups. Table 1 provides descriptive statistics.

## 2.2 Repurchase Dataset

Researchers investigating actual corporate share repurchases have to overcome two large difficulties: pre-2004 repurchase proxies taken from non-SEC sources have been shown to be inaccurate and biased, and the newer repurchase proxies compiled from SEC filings require a great deal of time and effort to collect. As such, newer datasets are generally limited to a small subset of firms over a short time frame.

Using Compustat's PRCRAQ quarterly repurchase proxy, compiled only after 2004 according to SEC filings, allows for a longer stock repurchases time-series and a greater firm cross-section. PRCRAQ does not differentiate between repurchase types and as such, non-OMR repurchases may be included. This study requires a firm to purchase at least .01% of its quarterly shares outstanding in order for that quarter to be classified as a repurchase quarter. To further test the data's accuracy, a further comparison between the Compustat PRCRAQ measure and a sample of hand-collected monthly repurchase data taken directly from SEC 10-Q and 10-K filings was conducted and the Compustat measure was found to be highly accurate.

Ultimately, the sample consists of the entire Compustat universe existing after January 1, 2004, until December 31, 2013. It does not include firms in the financial or utilities industries (3-digit SIC codes 600–699 and 400–499) and those firms where CRSP data is not available. In total, the sample consists of 97,460 firm-quarter observations, consisting of activist targeted repurchase quarters, activist non-targeted repurchase quarters, non-targeted repurchase quarters, and non-targeted non-repurchase quarters.

## 2.3 Methodology

Hypotheses are tested running the following regression model over the entire sample.

$$(Y_i = \alpha + \beta_1 ActAfter + \sum_{i=1}^n \beta_i X_i + \varepsilon_i) \quad (1)$$

where  $Y_i$  is a vector of repurchase measures including: REP, defined as either 0 or 1 based on whether or not the firm repurchases stock in the specified quarter of interest, respectively; REPSIZE, defined as the size of the quarterly number of shares repurchased (millions); PEAVG, defined as the difference between the average quarterly repurchase price and the within-quarter average, low, or median daily stock price as a percent; and PROFIT, defined as the rate of return of buying shares at the average quarterly repurchase price and selling the shares at the following

quarter's within-quarter average, low, or median daily stock price. *ACT\_DUMMY* is a dummy variable that receives a 1 if the company is ever targeted by an activist hedge fund and 0 otherwise. *ACT\_AFTER* is a dummy variable that receives a 1 if the firm-quarter under scrutiny currently has an activist presence. It receives a 0 otherwise. These are the main variables of interest when comparing firms targeted by activist hedge funds to those that have not been targeted.  $\mathbf{Xi}$  is a vector of control variables including: *FSIZE*, the natural logarithm of quarterly firm total assets. *DTOA*, the firm's quarterly debt to asset ratio, defined as the natural logarithm of quarterly firm total liabilities divided by total assets. *MTOB*, defined as the firm's quarterly market capitalization divided by its stockholder's equity net any preferred stock. *STDPRC* (*STDPRCL1*), defined as the standard deviation (lagged) of within-quarter daily stock price. *CSHOPQ* (*CSHOPQL1*), defined as the number of shares repurchased in the (previous) quarter. *ACTDIVYIELD*, defined as an interaction variable between *ACTAFTER* and *DIVYIELD*, the ratio of common dividends per share to price per share. And finally, *MNHBAS*, defined as the within-quarter average daily half bid-ask spread. Firm fixed effects are included using company *PERMNO*, and yearly time fixed effects are also included.

### 3. Results

Activists are required to state their objectives within an SEC form 13D upon taking a 5% or greater position within a company. One of the most popularly mentioned objectives is to increase the company's excess cash payout. The descriptive statistics provided above show that targeted firms do appear to have higher than average excess cash holdings when compared to non-targeted firms. If the activist investors plan to decrease excess cash holdings through OMRs, they may do so in one of two (or both) ways: increasing repurchase sizes, or repurchasing more often. This study's initial analysis explores whether there is a significant OMR increase after being targeted, and if so, how that increase manifests itself. Table 2 explores OMR propensity.

Table 2, column 1, provides univariate probit regression results regressing *REP* on *ACT\_DUMMY* and *ACT\_AFTER*. *REP* takes on a value of 1 if the firm makes a repurchase during the quarter and 0 otherwise. The variable of greatest interest is *ACT\_AFTER* which describes firm quarters where an activist hedge fund maintains at least a 5% stake. *ACT\_DUMMY* is a dummy variable populated with a 1 if the company is ever an activist target and 0 otherwise. Column 1 suggests that activist-targeted firms repurchase less often than their peers before being targeted, as denoted by the significantly negative *ACT\_DUMMY* coefficient. Marginal effect analysis (not shown) suggests that firms that are not targeted by a hedge fund within the sample time period have a 19.33% repurchase propensity when all other variables are held at the mean. In comparison, firms that are eventually targeted by hedge funds are almost 5% less likely to repurchase during any given quarter (a 14.53% marginal effect). Both marginal effects are statistically significant at the 1% level. Such an

increase may not initially strike the reader as economically significant; however, if one were to calculate the repurchase's expected value at the average target repurchase price using the summary statistics' average/maximum repurchase size, it would result in an expenditure between \$185,185 and \$5,755,147 during any given quarter. Activist targeted companies (*ACT\_AFTER* =1) are correlated with a 3.6% increase in repurchase propensity, not fully closing the initial gap between their peers.

**Table 2: Propensity to repurchase**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>ACT_DUMMY</i>	-0.18***		-0.02	-0.02	0.00	0.07	-0.08	-0.08
<i>ACT_AFTER</i>	0.15**		0.06	-0.17	0.15	0.04	-0.10	0.35***
<i>FSIZE</i>		0.31***	0.31***	0.39***	0.24**	0.22**	0.47***	0.36***
<i>DTOA</i>		-0.12***	-0.12***	-0.14**	-0.15***	0.03	-0.17***	-0.36***
<i>CASH</i>		0.04***	0.04***	0.06*	0.02	0.05**	0.03	0.04
<i>MTOB</i>		0.01***	0.01***	-0.01	-0.00	0.00	0.01*	0.02***
<i>DIVYIELD</i>		0.47***	0.52**	0.04	0.70	0.97	0.34	0.30
<i>2007_Dummy</i>	-0.26***	-0.16***	-0.16***	-0.31**	-0.34***	-0.22***	-0.13*	-0.08
<i>2008_Dummy</i>	-0.15***	-0.04	-0.04	0.01	0.02	0.03	-0.09	-0.16***
Observations	92,920	92,582	92,582	13,919	15,973	16,908	17,577	18,993

Notes: This table presents probit regressions of repurchases on various company descriptors. A repurchasing quarter is defined as any quarter appearing in the sample where Compustat's *CSHOPQ* variable is greater than zero. *ACT\_DUMMY* equals one if the quarter occurs before activist targeting. *ACT\_AFTER* equals one if the quarter occurs after the firm is targeted. *FSIZE* is the natural log of a firm's total assets. *DTOA* is the company's total debt divided by total assets. *CASH* is the natural log of a company's total cash. *MTOB* is the company's market capitalization divided by the value of common equity. *DIVYIELD* is the company's quarterly dividend divided by the closing quarterly stock price. *2007\_Dummy* (*2008\_Dummy*) equals one if the quarter occurs during 2007 (2008). Columns (4)-(8) split the sample into firm size quintiles. All variables are winsorized at the 1st and 99th percentiles. Regressions include industry fixed effects and time fixed effects. Standard errors (not shown) are clustered by firm. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Columns 2 through 8 provide multivariate probit regression results regressing REP on the same variables, but also including various company finance characteristics. Initial results (column 3) suggest no repurchase size increase correlated with the presence of an activist hedge fund. Such a result is interesting given OMR popularity and the desire to decrease excess cash holdings. However, it is important to note that different firms may be constrained regarding how often they repurchase. For example, smaller firms with more volatile earnings may place greater reliance on holding consistent cash levels. As such, they may prefer to repurchase smaller amounts more often than their larger contemporaries. It should stand to reason that if one is already repurchasing quite often, the propensity to further increase repurchases might be quite low. Table 3 discusses this more thoroughly later

on. Upon splitting the sample into firm-size quintiles and analyzing each sub-sample separately, the analysis suggests that only the largest quintile increase repurchase frequency. Marginal effect analysis suggests that the largest firms, when targeted by a hedge fund, increase their propensity to repurchase by 13.39%, significant at the 1% level, when holding all other variables at their means. It is interesting to note that even within this largest quintile, there is significant variation in repurchase propensity. Marginal effect analysis of FSIZE, the natural log of a firm's total assets, results in an approximate 1% increase in repurchase probability per 10% increase in firm total assets.

**Table 3: Quarterly repurchase size**

	(1)	(2)	(3)	(4)
ACT_AFTER	-0.97**		4.51***	9.16***
FSIZE		1.71***	1.75***	2.99***
ACT_AFTER*FSIZE			-0.80***	-1.44***
CASH		0.31***	0.30***	0.64***
DTOA		-0.88***	-0.87***	-1.41***
DIVYIELD		1.84	1.71	8.52
MTOB		0.08***	0.08***	0.08**
PRCRAQ		0.01**	0.01**	-0.02*
STDPRC		-0.16***	-0.17***	-0.01
STDPRCL1		-0.10*	-0.10*	-0.05
MNHBAS		283.40***	283.77***	575.55***
2007_Dummy	2.76**	0.74***	0.72**	1.43***
2008_Dummy	2.07	-0.07	-0.11	0.26
R-Squared	0.11	0.23	0.23	0.30
Observations	39,975	38,794	38,794	19,462

Notes: This table regresses repurchase size on various company descriptors. A repurchase quarter is any sample quarter where Compustat's *CSHOPQ* variable is greater than zero. *ACT\_AFTER* equals one if the quarter occurs after the firm is targeted. *FSIZE* is the natural log of a firm's total assets. *DTOA* is the company's total debt divided by total assets. *CASH* is the natural log of a company's total cash. *MTOB* is the company's market capitalization divided by the value of common equity. *PRCRAQ* is the quarter's average repurchase price. *DIVYIELD* is the company's quarterly dividend divided by the closing quarterly stock price. *MNHBAS* is the mean half bid-ask spread represented as a percentage. *STDPRC(L1)* is the standard deviation (lagged) of daily closing stock prices within a quarter. *2007\_Dummy* (*2008\_Dummy*) equals one if the quarter occurs during 2007 (2008). Column (4) excludes all quarters with zero repurchases. All variables are winsorized at the 1st and 99th percentiles. Regressions include industry fixed effects and time fixed effects. Standard errors (not shown) are clustered by firm. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Simply analyzing repurchase propensity does not fully address whether or not firms increase cash payout. As noted earlier, firms may not be likely to repurchase more often simply because they are already repurchasing often, or perhaps because

instating another repurchase may be costlier than simply repurchasing a larger amount per repurchase transaction. Table 3 shines further light on how activists increase repurchases by analyzing the average repurchase size by number of shares. It is of interest that the univariate results in Column 1 suggest that activists actually decrease the average repurchase size. However, such results are questionable for the same reason mentioned above regarding firm size – perhaps in such instances one is simply seeing large firms drive the results. The multivariate results (columns 3 and 4) suggest that post-targeting, firms increase their average quarterly repurchase size. Column 3 analyzes all firm quarter observations and suggests that hedge fund activism is correlated with an increase of 4.51 million shares repurchased during repurchase quarters. Column 4 removes all non-repurchase quarters, thereby increasing the coefficient to 9.16, or 9.16 million shares, significant at the 1% level. Note that interacting ACT\_AFTER with firm size yields a statistically significant and negative coefficient (-1.44, significant at the 1% level). This may help to explain the results appearing in Table 2 suggesting that increased repurchase propensity centers around larger firms. Mathematically speaking, the significance of this coefficient is that when ACT\_AFTER is 0, the FSIZE coefficient remains 2.99. Consequently, for a 1% increase in firm size, the average repurchase increases by 29,900 shares. When ACT\_AFTER is 1 the -1.44 interaction coefficient decreases the FSIZE coefficient and for a 1% increase in firm size, the average repurchase increases by only 15,500. Ultimately, as firm size increases, hedge fund activists seemingly increase total repurchases at a decreasing rate. The results may explain the results suggested in Table 2 – instead of simply repurchasing larger amounts, larger firms also repurchase more often when prompted by hedge fund activists.

The question to be addressed is, “How well do firms repurchase after being targeted by a hedge fund activist?” According to market timing theory, a firm that successfully times the market should repurchase when company stock is undervalued. However, a firm wishing to time its repurchases must consider how the repurchase affects future stock price. As the firm repurchases more and more stock it will increase the stock price, thereby eventually repurchasing at prices that are too high. Additionally, as the firm repurchases more often it risks repurchasing during times when its stock is indeed not undervalued but potentially overvalued, again causing repurchasing at prices that are too high. Simply looking at the sample averages, the average target repurchase before being targeted was \$23.23; after being targeted the average repurchase price increased by approximately 9.6% to \$25.71. While Tables 2 and 3 both suggest that activist hedge funds increase both the target’s propensity to repurchase and the target’s average repurchase size, the following analyses attempt to shine light on activist target’s OMR timing quality.

Due to the fact that specific repurchase dates are unavailable, this study does not analyze cumulative abnormal returns (CARs) surrounding an event date. Instead, it compares the average quarterly repurchase price to various within-quarter price benchmarks, and refers to this as repurchase quality. The quality measure is the

difference between the average quarterly repurchase price and the specific price benchmark reflected as a percent. Such a measure is similar to the DIFF measure used by Ben-Raphael, Oded, and Wohl (2013). The higher quality repurchases have a smaller percent difference in the positive direction and a larger negative percent difference – a negative percent difference suggests the repurchase is made below the prevailing price benchmark. Firms that successfully time the market must be high quality repurchasers. Table 4 provides regression results. Columns 1–3 use the average daily within-quarter closing price as the price benchmark. Column 3 suggests that the percent difference between the quarter's average repurchase price and the average daily stock price is 95 basis points (BPs) higher for activist-targeted firms compared to their non-targeted firms. For interpretation sake, consider the average target repurchase price after being targeted, \$25.71 per share. The 98 BP premium suggests that they could have otherwise repurchased at an average price of \$25.46 and are thereby overpaying approximately \$0.25 per share. A target repurchasing 1.68 million (average) number of shares thereby overpays by \$423,360 per repurchase quarter. Considering many firms may repurchase greater than average amounts multiple times per year (the largest target repurchase within the sample is ~121.4 million shares), paying such a premium is not just statistically significant but economically significant. The positive FSIZE coefficient (across all columns) suggests that larger firms overpay for the shares they purchase and is consistent with the findings of Ben-Raphael et al. (2013).

Columns 4–6 use the quarter's low stock price as the price benchmark. One could argue that this benchmark best reflects market timing propensity and repurchase efficiency because firms wishing to time the market should strive to make repurchases as close to the quarterly low price as possible. A perfectly efficient repurchaser should have an efficiency measure of 0 because an open market repurchase less than the lowest price is impossible. Columns 4 and 6 suggest that activist-targeted firms repurchase at prices that are 2.26% higher than the quarterly low price (univariate) and 1.55% higher than their non-targeted peers (multivariate), respectively. Using the same logic as above, this suggests activist-targeted companies purchasing stock at the average target low price, \$14.73, are overpaying by between \$377,715 (average repurchase size) and \$27,294,378 (maximum repurchase size) per repurchase quarter. Columns 7–9 use the median within-quarter daily stock price as the price benchmark and provides similar results.

It is important to note that within-quarter market timing may not necessarily be the predominant focus of repurchasers. Repurchasers may not be overly worried about how well they repurchase compared to within-quarter stock prices but rather, how well they repurchase compared to future stock prices outside the quarter. This study refers to this as repurchasing profitability. The profitability measures are similar to the quality measures, with one major difference: instead of focusing on within-quarter prices, the focus is on the following quarter's prices.

Table 4: Price Efficiency

	Average Quarterly Stock Price			Low Quarterly Stock Price			Median Quarterly Stock Price		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ACT_AFTER	0.76***		0.95***	2.26***		1.55**	0.74**		1.11***
FSIZE		0.34***	0.35***		0.44**	0.45**		0.34***	0.34***
CASH		-0.07	-0.06		-0.14	-0.13		-0.10	-0.09
DTOA		0.47**	0.45**		1.77***	1.75***		0.60***	0.58***
MTOB		-0.03**	-0.03**		-0.07**	-0.07**		-0.05***	-0.05***
STDPRC		-0.31***	-0.31***		0.32**	0.32**		-0.24***	-0.24***
STDPRCL1		0.15**	0.15**		-0.27***	-0.27***		0.09*	0.09*
STDRET		0.23	0.23		8.13***	8.13***		1.02***	1.02***
CSHOPQ		-0.00	-0.00		0.00	0.00		0.00	0.00
CSHOPQL1		0.01*	0.01*		0.01*	0.01*		0.01*	0.01*
MNHBAS		2.26***	2.28***		-2.79	-2.75		130.04*	132.66*
2007_Dummy	0.56**	0.73*	0.78**	0.90**	-0.75	-0.66	1.74*	1.14***	1.21***
2008_Dummy	1.57***	1.55***	1.64***	13.50***	-0.57	-0.42	1.90***	0.90*	1.01*
R-squared	0.05	0.09	0.09	0.14	0.33	0.33	0.01	0.08	0.08
Observations	19,925	14,902	14,902	19,925	14,902	14,902	19,925	14,902	14,902

Notes: This table regresses price efficiency on various company descriptors. Price efficiency is determined as the percent difference between the firm's average repurchase price (PRCRAQ) and the within-quarter stock price measure (average daily close, median daily close, quarterly low price). ACT\_AFTER equals one if the quarter occurs after the firm is targeted. FSIZE is the natural log of a firm's total assets. DTOA is the company's total debt divided by total assets. CASH is the natural log of a company's total cash. MTOB is the company's market capitalization divided by the value of common equity. STDPRC(L1) is the standard deviation (lagged) of daily closing stock prices within a quarter. STDRET is the standard deviation of daily buy and hold return. CSHOPQ(L1) is the number of shares repurchased in the (prior) quarter. MNHBAS is the mean half bid-ask spread represented as a percentage. 2007\_Dummy (2008\_Dummy) equals one if the quarter occurs during 2007 (2008). Column (4) excludes all quarters with zero repurchases. All variables are winsorized at the 1st and 99th percentiles. Regressions include industry fixed effects and time fixed effects. Standard errors (not shown) are clustered by firm. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5: Repurchases Profitability**

	Average Price Profitability			Low Price Profitability			Median Price Profitability		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
ACT_DUMMY	0.58		1.01	2.89**		2.48*	0.11		0.11
ACT_AFTER	2.77***		3.18***	3.14*		3.89**	0.63**		0.89***
QTR1STACT	-4.94**		-2.50	-10.75***		-8.21**	0.60		2.47**
FSIZE		0.98***	1.03***		0.65	0.75		0.26***	0.27***
DTOA		0.72	0.61		2.04**	1.85**		0.43***	0.41**
CASH		-0.77***	-0.76***		-1.30***	-1.29***		-0.02	-0.02
MTOB		-0.12***	-0.11***		-0.13*	-0.12		-0.05***	-0.04***
DIVYIELD		72.15***	72.21***		111.36***	111.59***		10.69**	10.73**
MNHBAS		277.03*	290.42**		116.81	139.64		161.81***	164.49***
2007_Dummy	8.83***	10.55***	10.77***	13.70***	15.58***	15.90***	0.85***	1.24***	1.28***
2008_Dummy	19.47***	20.49***	20.84***	41.40***	36.57***	37.04***	1.08***	1.21***	1.29***
R-squared	0.17	0.19	0.19	0.22	0.25	0.26	0.05	0.07	0.07
Observations	18,914	14,751	14,751	18,941	14,779	14,779	19,925	15,650	15,650

Notes: This table regresses repurchase profitability on various company descriptors. Profitability is determined as the percent difference between the firm's average repurchase price (PRCRAQ) and the following quarter's stock price measure (average daily close, median daily close, quarterly low price). ACT\_DUMMY equals one if the quarter occurs before activist targeting. ACT\_AFTER equals one if the quarter occurs after the firm is targeted. QTR1STACT equals one if the quarter is the initial activism quarter. FSIZE is the natural log of a firm's total assets. DTOA is the company's total debt divided by total assets. CASH is the natural log of a company's total cash. MTOB is the company's (lagged) market capitalization divided by the value of common equity. DIVYIELD is the quarterly dividend paid divided the closing quarterly stock price. MNHBAS is the mean half bid-ask spread represented as a percentage. 2007\_Dummy (2008\_Dummy) equals one if the quarter occurs during 2007 (2008). Column (4) excludes all quarters with zero repurchases. All variables are winsorized at the 1st and 99th percentiles. Regressions include industry fixed effects and time fixed effects. Standard errors (not shown) are clustered by firm. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Table 6: Repurchase Announcements – CARs**

<b>Panel A:</b>	Cumulative Abnormal Returns				
	1-day	3-day	5-day	10-day	30-day
Activist Targeted	3.06%	3.39%	3.91%	4.15%	5.33%
Non-Targeted	1.78%	2.19%	2.44%	2.85%	4.20%
Difference	1.28%***	1.20%***	1.47%***	1.30%*	1.13%
<b>Panel B:</b>	(1)	(2)	(3)	(4)	(5)
	1 Day CARs	3 Day CARs	5 Day CARs	10 Day CARs	30 Day CARs
ACT_AFTER	0.013*	0.012*	0.015**	0.012	0.008
FSIZE	-0.003***	-0.003***	-0.004***	-0.005***	-0.012***
CASH	0.002***	0.002***	0.003***	0.003***	0.006***
DIVYIELD	0.049	0.216***	0.180**	0.163	0.042
MNHBAS	1.789**	2.698***	3.203**	2.735*	6.197*
CRISIS DUMMY	0.004	0.008**	0.009**	0.011**	0.006
R-squared	0.082	0.092	0.096	0.086	0.081
Observations	3,190	3,191	3,191	3,185	3,153

Notes: This table presents the cumulative abnormal returns (CARs) occurring after a company announces its intent to initiate a repurchase plan. Theoretical returns are based upon the Carhartt 4-factor model using the 100 days before the event as the control sample. Event windows include the 1, 3, 5, 10, and 30 days following the repurchase announcement. Repurchase announcement dates are taken from Thomson Reuters' SDC Platinum. Only open market repurchase announcements made by U.S. firms are included. Activist targeted quarters are the quarters during and after a company has been targeted by a hedge fund. Non-Targeted quarters are the quarters where no hedge fund activist is involved. Panel A provide basic difference in means analysis. Panel B provides OLS regression results. All standard errors (in parentheses) are clustered by firm. Panel B regresses CARs on additional company descriptors. *ACT\_AFTER* equals one if the quarter occurs after the firm is targeted. *FSIZE* is the natural log of a firm's total assets. *CASH* is the natural log of a company's total cash. *DIVYIELD* is the quarterly dividend paid divided the closing quarterly stock price. *MNHBAS* is the mean half bid-ask spread represented as a percentage. *CRISIS DUMMY* equals one if the quarter occurs during 2007 or 2008. Column (4) excludes all quarters with zero repurchases. All variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. Regressions include industry fixed effects and time fixed effects. Standard errors (not shown) are clustered by firm. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

All other intuition is similar – firms wish to repurchase at prices that are substantially lower than the following quarter's price benchmarks. The more negative the timing measure, the more profitable the repurchase. It should be mentioned here that once a firm is targeted it is always considered a targeted firm, whether or not the activist is still a substantial common stock holder. According to BJPT, the majority of activist hedge funds held the required 5% stock necessary to be considered an activist at the sample's end. Accordingly, there should be no significant difference in activism presence between the first quarter and the last quarter, and the timing measures occurring further away from the initial activism date should equally reflect activists' effect upon outside-quarter repurchase timing.

Table 5 analyzes outside-quarter repurchase profitability using the average daily stock price, the quarterly low stock price, and the quarterly median stock price for the quarter following the repurchase. Columns 1 and 3 use the following quarter's average daily stock price as the price benchmark. Column 1 provides univariate results and suggests that activist-targeted firms repurchase at prices that are 2.77% higher than the average daily stock price in the following quarter. Such a premium implies the target is overpaying by approximately \$1.16 million, both a statistically and economically significant amount. This result should seem surprising if activist hedge funds increase shareholder value as much as the earlier literature states. However, if we look specifically at the initial activism quarter, the results differ. QTR1STACT is a dummy variable taking the value 1 if the quarter under scrutiny is the first quarter during which the activist targeted the firm. Notice the timing coefficient here is highly negative (-4.94 significant at the 95 level) and suggests that repurchases made during the activism quarter are made at prices significantly below the following quarter's stock price (a good repurchase). Column 3 suggests that activist targeted hedge funds are repurchases at prices that are 3.18% higher than the following quarter's average daily stock price, thus implying the repurchasers are overpaying by approximately \$1.33 million.

Columns 4 and 6 use the following quarter's low stock price as the price benchmark. The results are similar in direction and magnitude (2.77% and 3.18% respectively), although the QTR1STACT coefficient is approximately double in size (-10.75 and -8.21 respectively). The following coefficients are omitted from display for brevity: STDPRC, STDPRCL1, STDRET, AVGRETL1, STDRETL1, STDRETL2, MTOBL1, and CONSTANT.

Finally, it has yet to be established if the market even desires targeted corporations to increase cash payout. Hedge fund activists tend to defend their activist positions by essentially arguing that they know better than management what is beneficial to shareholders and are simply encouraging, or perhaps forcing, those actions to be taken. One such action that is commonly cited within SEC form 13D filings is that the activist intends to increase repurchases with the goal of ultimately boosting company stock price. If the market believes, for example, that the company's increased cash holdings are resulting in increased agency costs, then perhaps even suggesting that the firm plans to decrease cash holding might increase stock price. Subsequently, if targeted firms are paying out too little cash and hedge fund activists correctly identify those firms and

suggest change, then the initial repurchase announcements made by the firm post-targeting should excite the market and increase stock price.

It is a natural expectation that cumulative abnormal returns (CARs) should be more positive following repurchase announcements made by targeted firms compared to their non-targeted peers, due to earlier findings that they hold more cash (Brav, Jiang, and Kim, 2009). Table 6 computes CARs for the 1, 3, 5, 10, and 30 day(s) following the repurchase announcement date as reported by Thomson Reuters' SDC Platinum. Only repurchases flagged as open market repurchases are included within the sample. The abnormal returns are computed using the Carhartt 4-factor model. Panel A provides basic difference-in-means results. According to the table, CARs are higher for activist-targeted firms and that difference peaks 5 days after the announcement date, with a difference of 1.46% significant at the 1% level. It should not be surprising that the differences between the two firm classes lose statistical significance after day five. As one moves further away from the actual event date, additional noise is unavoidable and is likely to result in statistical insignificance. Panel B provides these results in a regression analysis setting. Results are similar in magnitude and significance. Columns 1-3 regress 1 day, 3 day, and 5 day (resp.) CARs on various financial characteristics including whether the quarters under scrutiny are activist-targeted quarters. In each column the ACT\_AFTER coefficient ranges from 12BPs to 15BPs and is statistically significant at the 10% level (column 3 is significant at the 5% level.) Such a small coefficient is more economically significant than it might appear at first glance. Considering that the average (median) target market capitalization is approximately \$2.1 billion (\$617million), an abnormal return of 15BPs over a five day period implies gains of \$3.15 million (\$0.925 million). Despite the statistical insignificance, columns 4 and 5 suggest effects of similar magnitude; however, such a lengthy time frame is likely to have additional noise and attributing any change in return to a single attribute is questionable.

#### **4. Conclusion**

In light of many large-scale hedge fund activist events targeting companies such as Dow Chemical, DuPont, and Yahoo, a controversy exists regarding how beneficial these activists are to shareholders. This paper shines light on the subject and adds evidence suggesting that activist hedge funds may diminish open market repurchase (OMR) quality. The most popular rationale for increased OMR usage is the inherent flexibility they have over the more traditional dividend payment. This flexibility allows managers to repurchase company stock at prices that are potentially below intrinsic value, thereby benefitting remaining shareholders. Conversely, this flexibility also allow managers to repurchase at prices that are too high. Hedge fund activist targets have been shown, both in this paper and earlier studies, to repurchase less often than their peer companies. Of course, this observation may simply be explained by suggesting that the companies simply hoard cash. However, under the assumption that the companies time their repurchases alongside undervaluation periods, the targets may simply be repurchasing less often because undervaluation periods are relatively rare. It follows then that

pressuring targets that currently repurchase only to capture undervaluation to do so more often could lead to repurchasing at prices that are actually above intrinsic value. In such an instance, the company is actually paying a price that is too high, wasting valuable capital and potentially rewarding selling shareholders while harming those who remain.

This study reaches three conclusions: (1) Hedge funds increase OMRs within targeted companies either through increasing individual repurchase sizes, through repurchasing more often, or through a combination of the two. (2) Hedge funds decrease the quality of OMR timing. Post-activism, the evidence suggests that hedge fund-targeted repurchasers pay premiums upwards of \$1 million per repurchasing quarter. (3) After announcing a repurchase, abnormal market returns reaching up to (on average) 15BPs result, thus suggesting that the market seemingly agrees that targeted firms pay out too little cash. Taken in total, the results suggest that, though activists might pursue noble causes that are initially investor-approved, the pressure they add to increase repurchases diminishes the repurchases' quality significantly. In agreement with well-known investor Warren Buffett, such a strategy harms shareholders and, while such strategies might not result in a net decrease in firm value resulting from other activist objectives, they certainly mitigate any value creation.

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