

The Real Effects of Hedge Fund Activism: Productivity, Asset Allocation, and Product Market Concentration

Alon Brav (Fuqua School of Business)

Wei Jiang (Columbia Business School)

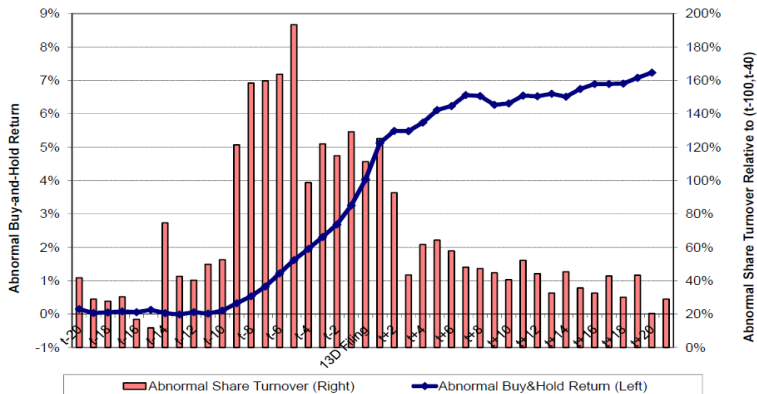
Hyunseob Kim (Johnson School of Management)

September, 2012

DISCLAIMER:

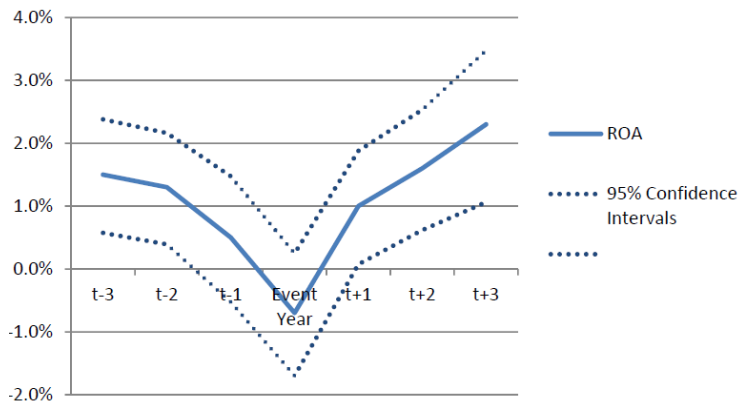
Any opinions and conclusions expressed herein are those of the author(s) and do not necessarily represent the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed.

What do we know about hedge fund activism? Abnormal returns



- U.S. evidence: Klein and Zur (2009), Clifford (2008), Boyson and Mooradian (2007), Greenwood and Schor (2009).
- Europe: Becht, Franks, and Grant (2009), Stokman (2008). Germany: Mietzner and Schweizer (2008).
- Japan: Uchida and Xu (2008).

What do we know about hedge fund activism? Operating performance



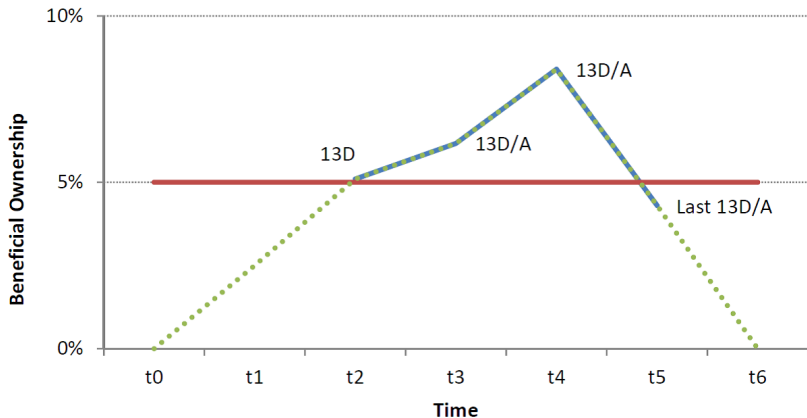
- Control: firm size, age, industry and year fixed effects.
- F-test: $(t+3) - t$ or $(t+3) - (t-1)$, p-value 0.00.

What we would like to know

- The source of fundamental improvement.
 - Plant-level productivity before and after targeting.
 - Interaction with product market concentration.
- Assets in place efficiency gain vs. capital reallocation.
 - Continuing vs. sold plants.
- Survivorship bias w.r.t. Compustat.
- To what extent the effect is causal.

Hedge fund activism data

- All hedge fund activism events over 1994-2007.
 - Mostly from Schedule 13D filings and amendments. News search and other SEC filings for more information about the events.
 - Firm variables mostly from WRDS.



U.S. Census Bureau data

- Census of Manufacturers (CMF) and the Annual Survey of Manufacturers (ASM) to compute measures of productivity, profitability, and product market competition.
 - CMF covers all manufacturing plants in the U.S. (public and private) with at least one employee for years ending 2 or 7 (the Census years), including roughly 300,000 plants in each census. ASM covers about 50,000 manufacturing plants for the non-Census years.
 - Plant-year data on total value of shipments, capital stock and investment, labor hours, and material and energy costs.
- Longitudinal Business Database (LBD). Unique firm-plant links.
 - Follow plants independent of ownership changes.
 - Number of employees, annual payroll, industry classifications, and geographical location.

Activism sample matched with the Census

Criterion	# events	# plant-years
1. All activism events	2,180	–
a. Manufacturing targets	649	–
b. Non-manufacturing targets	1,531	–
2. Matched to Census with TFP elements	305	6,561
a. Manufacturing targets	275	6,028
b. Non-manufacturing targets	30	533

- Sample of 305 activism events over 1994-2007, 126 (179) from the 1990s (2000s). Covering 113 out of 134 SIC3 industries present in Census.

Representativeness

- Representative of activism events in terms of tactics, objectives, and success rates.
- Compared to Compustat firms: smaller, lower valuation, higher cash flow, lower payout, and lower growth.
- Compared to Census firms: larger, higher wage, higher productivity.

Total factor productivity (TFP) estimates

- Estimate a log-linear Cobb-Douglas production function by year and industry (Lichtenberg and Siegel (1990), Schoar (2002), Bertrand and Mullainathan (2003), Maksimovic, Phillips and Yang (2010))

$$\ln(Y_{ijt}) = \alpha_{jt} + \beta_{jt}^K \ln(K_{ijt}) + \beta_{jt}^L \ln(L_{ijt}) + \beta_{jt}^M \ln(M_{ijt}) + \epsilon_{ijt},$$

where i , j , and t index for plants, industries, and years.

- Y : Total output; deflated.
- K : Net capital stock.
- L : Labor input in man hours.
- M : Material costs.
- α_{jt} : Industry-year specific intercept.
- ϵ_{ijt} : Total factor productivity (TFP). Measures the relative productivity of plant i within a given industry (j) - year (t). Scaled by standard deviation.

Measuring changes in TFP around activism

- Estimate abnormal performance as follows:

$$y_{it} = \alpha_t + \sum_{k=-2}^2 \gamma_k d_{it}[t+k] + \lambda \text{Control}_{it} + u_{it}.$$

- $d_{it}[t+k]$: dummy for being targeted in year $t+k$.
- Controls: segment size (number of plants within a firm) and plan age.
- Report results for both plan and firm-level regressions.

Productivity from t-2 to t+2

(Dependent variable: TFP)

Unit	Plant	Firm
d[t-2]	0.074	0.106
	2.92	1.91
d[t-1]	0.042	0.07
	1.62	1.4
d[t]	0.041	-0.005
	1.49	-0.11
d[t+1]	0.032	0.003
	0.98	0.05
d[t+2]	0.096	0.096
	2.82	1.42
Controls and fixed effects	Y	Y
Observations	633,510	334,631
R2	1.19%	0.36%

d[t+1] - d[t-1]	-0.01	-0.068
	0.35	1.42
d[t+2] - d[t]	0.056*	0.101*
	1.78	1.72
d[t+2] - d[t-1]	0.055*	0.026
	1.65	0.41

- "V" shaped change around activism.
- Significance improves with data updating.

Mapping to an empirical study

- Concentration proxies for competition (the “agency view”).
 - Competition induces higher effort (Schmidt, 1997).
 - Competition increases efficiency of incentives (Hart, 2003).
 - Competition reduces managerial rents (Raith, 2003).
- Concentration proxies for asset specificity and redeployability (the “IO view”).
 - More comparable firms facilitate outsider monitoring.
 - More players facilitate assets (physical or human) redeployment.
- Most related empirical finding by Giroud and Mueller (2010): a substitution effect between takeover defense and product market competition.
- Compute the degree of concentration using the HHI index at the 3-digit SIC level.
- Correlation of HHI using the Census data (including private firms) and that using Compustat data is 0.17.

Conditioning on product market concentration

(Dependent variable: TFP)

d[t-2]	0.119***	d[t] × HHI	-0.184	Least concentrated industries:	
	3.43		-0.34	d[t+1] - d[t-1]	0.024
d[t-1]	0.038	d[t+1] × HHI	-0.501		0.61
	1.04		-0.83	d[t+2] - d[t]	0.1***
d[t]	0.051	d[t+2] × HHI	-0.893		2.24
	1.35		-1.38	d[t+2] - d[t-1]	0.113***
d[t+1]	0.062	HHI	-0.187***		2.42
	1.38		-3.45	Most concentrated industries:	
d[t+2]	0.151***	Controls&fixed effects	Y	(d[t+1] - d[t-1]) × HHI	-0.592
	3.19	Observations	633,510		1.2
d[t-2] × HHI	-0.88	R2	1.20%	d[t+2] - d[t] × HHI	-0.708
	-1.75*				1.27
d[t-1] × HHI	0.091			d[t+2] - d[t-1] × HHI	-0.983
	0.16				1.57

Why targeting firms in concentrated (top quartile) industries?

Dep Variables	Leverage	Capx	DivYld	Total Payout Yld	CEOTurnover
d[t-2]	0.014 [1.15]	0.015 [0.05]	-0.125 [-0.59]	-0.148 [-0.67]	0.054 [1.57]
d[t-1]	0.005 [0.49]	-0.169 [-0.66]	0.446 [1.58]	0.556* [1.76]	-0.005 [-0.16]
d[t]	0.021* [1.87]	-0.482** [-1.99]	0.591** [2.02]	0.570* [1.84]	0.056 [1.62]
d[t+1]	0.037*** [2.75]	-0.628** [-2.30]	0.534 [1.57]	0.693* [1.84]	0.092** [2.29]
d[t+2]	0.034** [2.31]	-0.777*** [-3.29]	-0.154 [-0.49]	-0.097 [-0.29]	0.060* [1.81]
Controls&Fixed Effects	Y	Y	Y	Y	Y
Observations	28,249	27,845	28,178	28,119	9,364
R-squared	0.178	0.224	0.107	0.102	0.030

For comparison: target firms in non-concentrated (bottom quartile) industries

Dep variables	Leverage	Capx	DivYld	Total Payout Yld	CEOTurnover
d[t-2]	0.030**	-0.024	-0.331**	-0.378**	-0.008
	[2.32]	[-0.07]	[-1.98]	[-2.19]	[-0.21]
d[t-1]	0.035***	-0.272	0.093	0.073	0.027
	[2.66]	[-0.98]	[0.46]	[0.35]	[0.70]
d[t]	0.026**	-0.443*	0.265	0.328	0.032
	[2.03]	[-1.67]	[1.00]	[1.17]	[0.76]
d[t+1]	0.033**	-0.249	0.426	0.429	0.047
	[2.37]	[-0.80]	[1.33]	[1.26]	[1.06]
d[t+2]	0.01	-0.538*	-0.172	-0.229	0.056
	[0.73]	[-1.70]	[-0.60]	[-0.77]	[1.02]
Controls&Fixed Effects	Y	Y	Y	Y	Y
Observations	37,550	30,116	37,488	37,294	9,495
R-squared	0.26	0.402	0.257	0.265	0.01

Capital reallocation

- Redeployment of capital is a common stated goal of activist hedge funds.
 - Push for the sale of the entire target company in about 20% of events.
 - In another 15% push for the divestiture of under-performing or non-core assets.
- The "sale of the company" objective category generates the highest announcement return, and experiences the highest attrition rate (31%).

Limits of research using CRSP/Compustat

- Surviving firms: Cannot separate productivity gains from existing assets from gains due to reallocation.
 - The Census data is recorded at the plant level, and therefore survives ownership changes.
- A delisting bias?
 - Within two years after intervention 18.6% of targets cease to be covered by Compustat—almost double the average attrition rate on Compustat.
- Direction of the delisting bias and magnitude not obvious *a priori*:
 - Targeted companies tend to have stronger fundamentals than matched firms (higher productivity and ROA, and higher liquidity).
 - Attrition is often a successful outcome.

Step 1. Conditioning on ownership at the event-year only

(Dependent variable: TFP)

d[t-2]	0.124***	d[t+1] - d[t-1]	-0.059***
	4.65		2.44
d[t-1]	0.061***	d[t+2] - d[t]	-0.02
	2.35		0.71
d[t] (year targeting)	0.043	d[t+2] - d[t-1]	-0.038
	1.58		1.33
d[t+1]	0.002		
	0.07		
d[t+2]	0.023		
	0.75		
Control&Fixed Effects	Y		
	-0.24		
Observations	633,147		
R2	1.19%		

No improvement without taking into account capital reallocation (plant sale).

Step 2. Conditioning on plant sales

(Dependent variable: TFP)

d[t-2]	-0.046	d[t+1] - d[t-1]	0.007
	-0.63		0.1
d[t-1]	-0.156***	d[t+2] - d[t]	0.168**
	-2.29		2.11
d[t] (year sold)	-0.202***	d[t+2] - d[t-1]	0.121
	-2.63		1.52
d[t+1]	-0.149*		
	-1.74		
d[t+2]	-0.034		
	-0.43		
Controls & Fixed effects	Y		
Observations	632,802		
R2	1.19%		

Sold plants were under-performing at sale, but improved two years later.

Firm level (Compustat) attrition bias

(Dependent variable: TFP)

d[t-2]xAttrition	0.032	d[t] x Non-attrition	0.048	(d[t+1] - d[t-1])xNon-attrition	-0.04
	0.65		1.52		1.25
d[t-1]xAttrition	0.002	d[t+1] x Non-attrition	0.017	(d[t+2] - d[t])xNon-attrition	0.036
	0.03		0.47		1.09
d[t]xAttrition	0.022	d[t+2] x Non-attrition	0.084***	(d[t+2] - d[t-1])xNon-attrition	0.027
	0.43		2.28		0.77
d[t+1]xAttrition	0.094	Controls & fixed effects	Y		
	1.27	Observations	633,510		
d[t+2]xAttrition	0.191**	R2	1.19%		
	2.07	(d[t+1] - d[t-1])xAttrition	0.092		
d[t-2]xNon-attrition	0.089***		1.37		
	3.07	(d[t+2] - d[t])xAttrition	0.169*		
d[t-1]xNon-attrition	0.056*		1.95		
	1.94	(d[t+2] - d[t-1])xAttrition	0.190**		
			2.1		

Delisted firms experience more improvement.

Remaining liquidation bias?

- There is still attrition from the Census data. What is the direction of the bias?
- About 35% of the plants present before hedge fund targeting disappear afterwards.
 - Small plants *random* non-sampling.
 - Actual liquidation: 16% for target plants vs. 27% for the control sample. If liquidation is distress related, target plants are *less* negatively censored than the control sample.

Capital reallocation in summary: A positive effect

- Underperforming plants are more likely to be sold after hedge fund intervention. Moreover, sold plants improve efficiency in the hands of new owners.
- Attrition from Compustat is a *good* outcome on average.
- Target plants are less likely to incur distress.
- Support the “IO” view of industry concentration.

Causality? On-going work

- Two different questions about the “treatment effect.”
 - If hedge fund activists were randomly assigned to firms, would they have improved performance?
 - Conditional on targeting, would the same changes have occurred in the absence of hedge fund effort?—More relevant for policy.
- Support from previous research.
 - Certain changes (e.g., CEO turnover) are outcomes of confrontation—unlikely to have occurred but for the commitment of activists.
 - Activists tend to hold concentrated stakes in target firms for an average holding period of two years. Undiversified positions together with costly engagements cannot be justified for pure stock picking (Gantchev, 2011).
 - Openly hostile activism generates higher announcement returns than non-confrontational ones (Klein and Zur, 2009). Activist stakes (13D) generates higher return than the revelation of large passive stakes (13G) (Clifford, 2008).

Identification

- Alternative 1: "Self-cure."
 - Key: A placebo test where a pseudo event is assigned to a firm-year observation where the firm is not targeted but experiences similar deterioration as the average target.
 - Target plants outperform the placebo benchmark.
- Alternative 2: Hedge funds pick firm where management would have implemented the changes voluntarily.
 - Key: openly confrontational events. News/SEC filings indicate that activists push for changes that are not agreeable to the management.
 - About 25% of the sample: Main results hold.
- Alternative 3: Hedge funds target firms best positioned in industry shocks.
 - Key: Performance of non-primary-industry divisions of targets.
 - Results are just as strong among non-primary divisions of targets.

Distinguishing intervention from mere stock picking

- Regulatory requirement for activist vs. passive stakes.
 - 13D (stock picking + potential intervention) vs. 13G (stock picking only).
- Focus on switching from “G” to “D” by our hedge funds.
 - No additional stock picking at the switch.
 - Should not switch unless intervention is necessary.
 - Any real effect post “D” should be attributed to hedge fund influence rather than stock picking.

Conclusion

- Martin Lipton of Wachtell, Lipton, Rosen & Katz:

“I think its a terrible thing for corporate America. I think what were seeing is a replay of the attempt to drive American business to short-term results instead of long-term values”

- Our work shows that hedge fund activists are neither “short-term focused” nor purely “financial engineering oriented.”
- We believe that there is a real effect on the fundamentals of targeted companies.
- Efficient capital reallocation is a particularly important channel, favoring competitive industries.