Cross-ownership and Acquisition Decisions

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May 31, 2018

Introduction

- Cross-owner: a shareholder of one firm holds shares in other firms as well.
- They hold different preferences over corporate decision due to externality.
- We investigate their impact on corporate strategies through M&A event.

Thanks for their works

- Cross-ownership, returns, and voting in mergers, *Gregor Matvo et al.*, JFE, 2008;
- Instituional cross-holdings and their effect on acquisition decisions, *Jarrad Harford et al.*, JFE, 2011;
- Institutional cross-ownership and corporate strategy: The case of mergers and acquisitions, *Yeqin Zeng et al.*, JCF, 2018.

Topics to cover

A Puzzle: Negative Announcement Returns

Put Pieces Together

Further Talks

Innovation and Institutional Ownership

Cross-ownership and Competition

Motivating Innovation

A Puzzle:
Negative Announcement Returns

A case: BAC-FBF

- Oct.27, 2003, BAC plans to acquire FBF.
- After, the market cap: BAC \$122 $\rightarrow$ \$113, FBF \$33.5 $\rightarrow$ \$42.5 (billion).
- The largest 10 shareholders of BAC owned 24%, so lost $\geq$ \$2 billion.
- Puzzle: why does bidder shareholders regularly allow value-destroying acquisitions?

Possible explainations

- Overconfidence of managers (Roll, 1986).
- Empire-building objectives of managers (Jensen, 1986).
- A price pressure effect on acquire's stock price (Mitchell, 2004).
- From cross-owners?

Preferences of cross-owners

- Consider a cross-owner who owns α_A percent of acquirer and α_T percent of target.
- Wealth gain:

$$\Delta W_{pre-to-post-deal} = \underbrace{\alpha_A(\Delta \text{acquirer value})}_{\text{Gain from Acquirer}} + \underbrace{\alpha_T(\text{takeover premium})}_{\text{Gain from Target}}$$

- Hypothesis: If $\Delta W_{pre-to-post-deal} \geq 0$, she will support a "bad" acquisition that lower the value of the acquirer.

Back to the BAC-FBF case

Table 1: Returns of 10 largest shareholders of BAC

Shareholder	BAC return	FBF return	Net return
Barclays	-430	461	31
Fidelity	-332	200	-133
State Street	-270	261	-9
Axa	-268	281	13
CRMC	-195	763	568
Vanguard	-170	168	-2
Mellon	-137	90	-47
Northern Trust	-118	99	19
Deutsche Bank	-115	106	-9
Morgan Stanley	-103	39	-64
Total	-2,139	2,469	329

$p \leq 0.01$
$p \leq 0.05$
$p > 0.05$

Measuring cross-ownerships

- α_A to measure influence on management, α_T to measure incentives.
  - dummy: whether exists $\alpha_A \geq \underline{\alpha_A}$ and $\alpha_T \geq \underline{\alpha_T}$.
- $\frac{\alpha_A}{\alpha_A+\alpha_T}$ v.s. $\frac{\alpha_T}{\alpha_A+\alpha_T}$.
- Coalition: $\sum_{i=1}^{N} \alpha_{A,i}$ v.s. $\sum_{i=1}^{N} \alpha_{T,i}$.

Data

- Mergers of publicly traded US companies from 1984 to 2006 reported in Center for Research in Security Prices (CRSP).
- Thomson Financial's Securities Data Company (SDC)
- Securities and Exchange Commission (SEC)
- Focusing our attention on institutional cross-owner for data availablity.

Summary statistics: merger bids and aggregate cross-ownerships

Table 2: Merger bids and cross-ownerships

Variable	Mean	Median	Std. Dev.
Panel A: Abnormal returns			
Acquirer CAR3 (1)	-0.013	-0.009	0.084
Target CAR3 (1)	0.194	0.147	0.242
Panel B: institutional ownership in acquirers			
Total institutional ownership	0.484	0.501	0.240
Shares of A institutions owning shares in T	0.162	0.109	0.156
Panel C: institutional ownership in targets			
Total institutional ownership	0.353	0.310	0.251
Shares of T institutions owning shares in A	0.198	0.138	0.187

Summary statistics: cross-ownerships

Table 3: Cross-ownerships of the largest acquirer institutional shareholders

	Mean stake (A)	Mean stake (T)	Mean weight (T)
shareholder rank in the acquirer:			
1	7.28%	1.00%	9.6%
2	4.40%	0.86%	11.5%
3	3.28%	0.72%	12.3%
4	2.63%	0.71%	13.6%
5	2.21 %	0.61%	14.1%
. . .			
10	1.24%	0.42%	14.3%
Coalition (1-10)	27.1%	6.28%	18.1%
Coalition (all)	48.4%	19.8%	26.2%

Finding

- Most institutional shareholders of the acquirer have no investment in the target.
- Acquirer shareholders with large cross-holdings tend to control only a small fraction of the acquirer's equity.
- Aggregated institutional investors makes sense, however the coalition is hard to form.

Wealth improvement of cross-owners

Table 4: Wealth improvement of institutional cross-owners in bad deals

	Mean loss on acquirer stake	Mean gain on target stake
shareholder rank in the acquirer:		
1	-27.34	5.62
2	-18.33	4.35
3	-14.61	5.48
4	-11.73	2.82
5	-10.05	2.97
. . .		
10	-6.21	2.13
Coalition (1-10)	-117.8	31.32
Coalition (all)	-268	95

Finding

- In average sense, at least for the bidders' largest institutional investors, the notion that "bidder shareholders do not lose from bad acquisitions because of their cross-holdings" is clearly rejected by the data.

Unusually large cross-holdings

Table 5: Cross-holdings of targets by acquirer institutional shareholders

Weight on target value	Percent of acquirer shares	
	Mean	95th Percentile
Greater than 10%	13%	39%
Greater than 30%	9%	29%
Greater than 50%	4%	15%

- Table 5 shows a subset of deals in which shareholders with large cross-holdings control enough of the acquirer's equity to be influential.
- Regression is doable.

Large cross-holdings v.s. CAR & synergies

Table 6: The effect of cross-holdings on CAR and synergies

	CAR3	CAR3	CAR3	Synergies	Synergies	Synergies
Dummy						
$\alpha_T \geq$, rank ≤ 10	0.07			0.19		
	(0.261)			(0.664)		
$\alpha_T \geq$, rank ≤ 10		0.002			0.214	
		(0.739)			(0.445)	
$\alpha_T \geq$, rank ≤ 10			0.004			-0.017
			(0.475)			(0.953)

Calls for further research

- Endogeneity between institutional cross-ownership and deal synergies:
  - institutional cross-owners could buy more shares of firms that tend to get involved in M&As and are likely to have higher deal synergies.
- IV approach: Russel 1000 and 2000 exogenous shock.

A creative design: cross-holding v.s. target selection

- Potential merger pairs: $\{(firm_i, firm_{-i})\}$.
- $n(n-1)$ pairs.

A creative design: cross-holding v.s. target selection

Table 7: The effect of cross-holdings on target selection

	(1)	(2)	(3)	(4)	(5)
Target share $\geq$ 10%	8.380***				
	(0.000)				
Target share $\geq$ 20%		8.190***			
		(0.000)			
Target share $\geq$ 30%			8.230***		
			(0.000)		
Target share $\geq$ 40%				7.654***	
				(0.000)	
Target share $\geq$ 50%					7.018***
					(0.000)

institutional cross-holdings between S&P 500 firms

- An important reason for the scarity of significant institutional cross-holdings is the small size of most targets.
- We confine our attention to S&P 500 firms, where cross-holding is prevalent.
- In this subset, will cross-holding play an active role?

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- An important reason for the scarity of significant institutional cross-holdings is the small size of most targets.
- We confine our attention to S&P 500 firms, where cross-holding is prevalent.
- In this subset, will cross-holding play an active role?
- Unfortunately, the answer is no.

Index funds :passive investors

- Index funds are generally passive investors.
- We believe public pressure from Risk Metrics ... will motivate fund managers.
- Further researches are needed.

Bad story continues

If coalition exists, will cross-owners vote for bad merger?

Probability of voting for bad

Table 8: Probability of voting for bad merger from cross-ownership

	Vote (for)	Vote (for)	Vote (for)
Panel A: Linear probability model			
Holdings in the target	0.016***	0.008**	0.025***
Merger fixed effects		Yes	
Fund fixed effects			Yes
Panel B: Logit models			
Holdings in the target	0.695***	0.498***	1.096***
Merger fixed effects		Yes	
Fund fixed effects			Yes
Panel C: Logit models (marginal effects)			
Holdings in the target	0.016***	0.122***	0.249***
Merger fixed effects		Yes	
Fund fixed effects			Yes

Endogeneity problems

- Bids correlate with cross-owners:
  - Manager believes that cross-owner will not resist the merger, so she increases bid.
  - Announcement return is too low to embrace, so cross-owners vote against it.
  - It is solved by adding Merger fixed effects.

- Because we know this regression brings a spurious link, it is reasonable to guess there exits some unobserved common factors determining both suitable merger partners and the types of firms each instituional share holder chooses to invest in.

Put Pieces Together

Further Talks

Innovation and Institutional Ownership

Innovation v.s. reputation

- Innovation process acts as the exploration of new untested actions are more likely to fail.
- Myopic investors: manager's ability may be underestimated when things go wrong for purely stochastic reasons.
- Managers need "heroes" to stand out and insulate their reputation against the low revenue.
- Otherwise undermining the innovations.

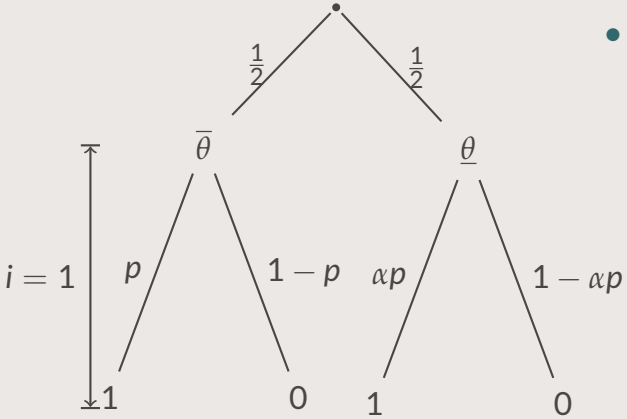
Some evidences

- 60% CEO's employment contracts are "at will", while the average time horizon of the remaining 40% is 2.65 years (Xu, 2009).
- Most of a CEO's payoff is determined not by the explicit contracts, but by the effect his reputation has on his ability to recontract.

Model: framework

- two period: $t = 1, 2$
- manager with unknown ability type $\theta \in \{\underline{\theta}, \overline{\theta}\}$.
- Manager chooses to innovate ($i = 1$) or not at first period.
- Manager receives his wages at second period according to his conditional expected ability.

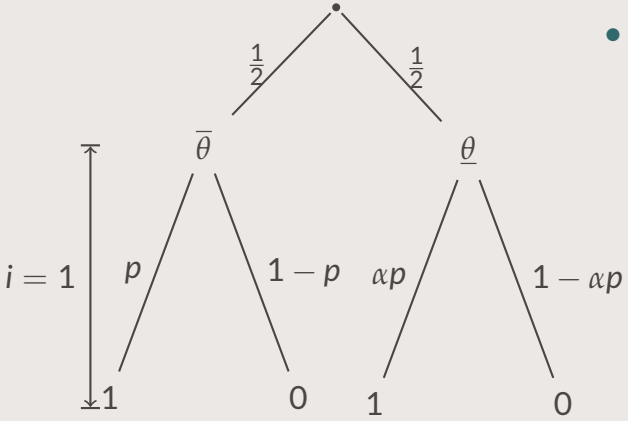
Model: without institutions



- The market updates its beliefs about managerial ability using Bayes' rule.

$$\begin{cases} Pr(\theta = \overline{\theta} | y_1 = 1) = \dfrac{1}{1+\alpha} \\ Pr(\theta = \overline{\theta} | y_1 = 0) = \dfrac{1-p}{2-p-\alpha p} \end{cases}$$

Model: with institutions



- The institutional investor acquires perfect information about the manager's ability if innovating.

$$Pr(\theta = \overline{\theta}|y_1) = \frac{1}{2}$$

Conclusion

- Institutional investment stimulates managerial innovation by insulating the manager against the reputational risk from a bad revenue realization.

Cross-ownership and Competition

Introduction

- Self-interested v.s. portfolio-interested
- Investors holding several firms in the same industry may prefer a coalition. (Cournot model)
- Cross-owners would design a new contract to incentive the manager acting as the way they prefer.

Model: market competition

- Inverse demand fn:

$$P(q_1, q_2) = A - q_1 - q_2$$

- Profit:

$$\pi_i = q_i(A - q_i - q_j - c_i) + \epsilon_i$$

Model: Managers

- Effort e_i:

$$c_i = \bar{c} - e_i$$

$$\text{disutility} = kq_i e_i^2 / 2$$

- Wage:

$$w_i = s_i + \alpha_i \pi_i + \beta_i \pi_j$$

Model: Owners

- Revenue:

$$\Phi_i = (\pi_i - w_i) + \lambda(\pi_j - w_j)$$

Conclusion

- The equilibrium incentive α decrease with the degree of cross ownership λ.
- Softer competition is created and larger amount of profit is generated.

Motivating Innovation

Exploration v.s. exploitation

- Exploration of new untested actions reveals information about potentially superior actions, but is also likely to waste time with inferior actions.
- Exploitation of well-known actions ensures reasonable payoffs, but may prevent the discovery of superior actions.

Two-armed bandit problem: time line

- Two period;
- The agent takes an action $i \in I$, producing output S (sucess) with p.
- Knowledges are learnt from period 1 to update belief of success probabilty.

Two-armed bandit problem: learning

- diff actions, diff Knowledges:

$$E[p_j] = E[p_j|S, i] = E[p_j|F, i], \text{ for } j \neq i.$$

- Conventional work ($i = 1$):

$$p_1 = E[p_1] = E[p_1|S, 1] = E[p_1|F, 1]$$

- New work ($i = 2$):

$$E[p_2|F, 2] < E[p_2] < p_1 < E[p_2|S, 2]$$

Two-armed bandit problem: action plan

- action plan $\langle i_k^j \rangle$
- expected payoff:

$$\begin{aligned} R(\langle i_k^j \rangle) = & \{E[p_i]S + (1 - E[p_i])F\} \\ & + E[p_i]\{E[p_j|S,i]S + (1 - E[p_j|S,i])F\} \\ & + (1 - E[p_i])\{E[p_k|F,i]S + (1 - E[p_k|F,i])F\} \end{aligned}$$

- exploitation $\langle 1_1^1 \rangle$; exploration $\langle 2_1^2 \rangle$

Principal-agent problem

- Private costs: c_1, c_2.
- Principal can not observe the actions taken by the agents.
- Output-based incentive schemem:

$$\vec{w} = \{w_F, w_S, w_{SF}, w_{SS}, w_{FF}, w_{FS}\}$$

Propositions

- To incentive exploitation, the principal must pay the agent an extra premium in the case of success in the first perid.
- To incentive exploration, the principal must delay compensation (w_F, w_{FS} are large).

Conclusion

- The optimal innovation-motivating incentive scheme exhibits substantial tolerance (or even reward) for early failure and reward for long-term success.

Thanks!