Do Peer Firms Affect Corporate Financial Policy?

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Background

- Most research on corporate financial policy
  - assumes capital structure is indenpendent of peer firms.
- Evidence suggests that
  - CFOs care peer firms' financing decisions in survey.[1]
  - Average leverage ratios determine capital structures.[2]

[1] Graham and Harvey (2001)

[2] Welch (2004), MacKay and Philips (2005), Frank and Goyal (2009)

Research Questions

- This paper identifies whether, how, and why
  - Peer firm behavior matters for capital structure.
- How can the reflection problem[3] be solved?
  - How can the endogenous selection be overcomed?
  - How can two channels be distinguished?
    - Action or characteristics?

[3] Manski (1993)

Main Findings

- Firms' capital structures are influenced by their peers.
- Peer firms' actions affect more than their characteristics.
- Managers learn from leading companies.

Data

- The merged CRSP-Compustat database.
  - 1965 - 2008, 44 years.
  - 9,126 firms.
  - 217 industry (3-digit SIC).
  - 80,279 firm-year observations.
- Winsorization at 1st and 99th percentiles.

Tab1. Summary Statistics

	Levels			First Differences		
	Mean	Median	*SD*	Mean	Median	*SD*
Peer Firm Averages						
Book Leverage (Total Debt/Book Assets)	0.238	0.229	0.094	0.004	0.003	0.031
Market Leverage	0.274	0.262	0.137	0.006	0.004	0.058
Log(Sales)	5.085	4.932	1.278	0.091	0.094	0.119
Market-to-Book	1.362	1.201	0.650	−0.032	−0.019	0.310
EBITDA/Assets	0.108	0.120	0.070	−0.002	−0.001	0.031
Net PPE/Assets	0.317	0.270	0.172	−0.002	−0.002	0.020
Firm-Specific Factors						
Book Leverage (Total Debt/Book Assets)	0.238	0.217	0.196	0.004	−0.000	0.098
Market Leverage (Total Debt/Market Assets)	0.274	0.216	0.246	0.006	0.000	0.123
Log(Sales)	5.085	5.018	2.172	0.091	0.089	0.357
Market-to-Book	1.362	0.966	1.244	−0.032	−0.006	0.829
EBITDA/Assets	0.108	0.129	0.155	−0.002	0.000	0.104
Net PPE/Assets	0.317	0.271	0.217	−0.002	−0.002	0.060
Industry Characteristics						
No. of Firms per Industry-Year	13.217	8.000	18.344			
Total No. of Industries	217					
Sample Characteristics						
Observations	80,279					
Firms	9,126					

Model Specification

- From the empirical capital structure literature[4],

$$y_{ijt} = \alpha + \beta \bar{y}_{-ijt} + \gamma' \bar{X}_{-ijt-1} + \lambda' X_{ijt-1} + \delta' \mu_j + \phi' \nu_t + \epsilon_{ijt} \quad (1)$$

  - y_{ijt} leverage.
  - $\bar{y}_{-ijt}$ peer firm average outcomes excluding itself.
  - $\bar{X}_{-ijt-1}$ peer firm average characteristics 1 year before.
  - X_{ijt-1} firm-specific characteristics 1 year before.
  - Industry and year fixed effects are considered.[5]

[4] Rajan and Zingales (1995), Frank and Goyal (2009)
[5] Petersen (2009)

Note on Capital Structure

- Dependent variables:
  - Book leverage (debt / assets)
  - Market leverage (debt / debt + market value of equity)

  ⋮

- Commonly accepted determinants:
  - Tangibility (property, plant and equipment / assets)
  - Growth opportunity (market-to-book ratio)
  - Firm size (log of sales)
  - Profitability (EBITDA / assets)

  ⋮

The Reduced-Form Model

- The reduced-form of equation (1) is[6]

$$E(y|X, \mu_j) = \alpha^* + \gamma^{*\prime} E(X|\mu_j) + \delta^{*\prime} \mu_j + \lambda^{*\prime} X \tag{2}$$

where

$$\gamma^{*\prime} = \left(\frac{\beta\lambda + \gamma}{1 - \beta} \right)'$$

- If $\gamma^{*\prime} \neq 0$, then β or $\gamma' \neq 0$.
  - i.e., the peer effects are significant.

[6] Manski (1993)

Exogenous Peer Firm Characteristic

- Lagged idiosyncratic variation in stock return.
  - Available for a broad panel of firms.
  - Relevently free from manipulation.
  - Impounding many value-relevant events.
  - Focused on a vast asset pricing literature already.
  - Showed a strong correlation with capital structure.[7]

[7] Marsh (1982), Loughran and Ritter (1995), Baker and Wurgler (2002), Welch (2004)

The Estimation of Return Shocks

- Following augmented market model is used:

$$r_{ijt} = \alpha_{ijt} + \beta^{M}_{ijt}(r_{Mt} - r_{ft}) + \beta^{IND}_{ijt}(\bar{r}_{-ijt} - r_{ft}) + \eta_{ijt} \tag{3}$$

  - A rolling annual basis using monthly returns.
  - 24 - 60 months of data.
  - $\hat{\eta}_{ijt} = r_{ijt} - \hat{r}_{ijt}$ idiosyncratic return.

Tab2. Stock Return Factor Regression Results

	Mean	Median	*SD*
α_{it}	0.008	0.007	0.017
β_{it}^{M}	0.399	0.422	0.803
β_{it}^{IND}	0.616	0.535	0.567
Obs. per Regression	59	60	5
Adjusted R^2	0.228	0.207	0.170
Avg. Monthly Return	0.013	0.000	0.182
Expected Monthly Return	0.015	0.014	0.090
Idiosyncratic Monthly Return	−0.002	−0.011	0.174

- $\bar{\eta}_{-ijt}$ annually compounded idiosyncratic return.

Tab3. Peer Firm Return Shock Properties

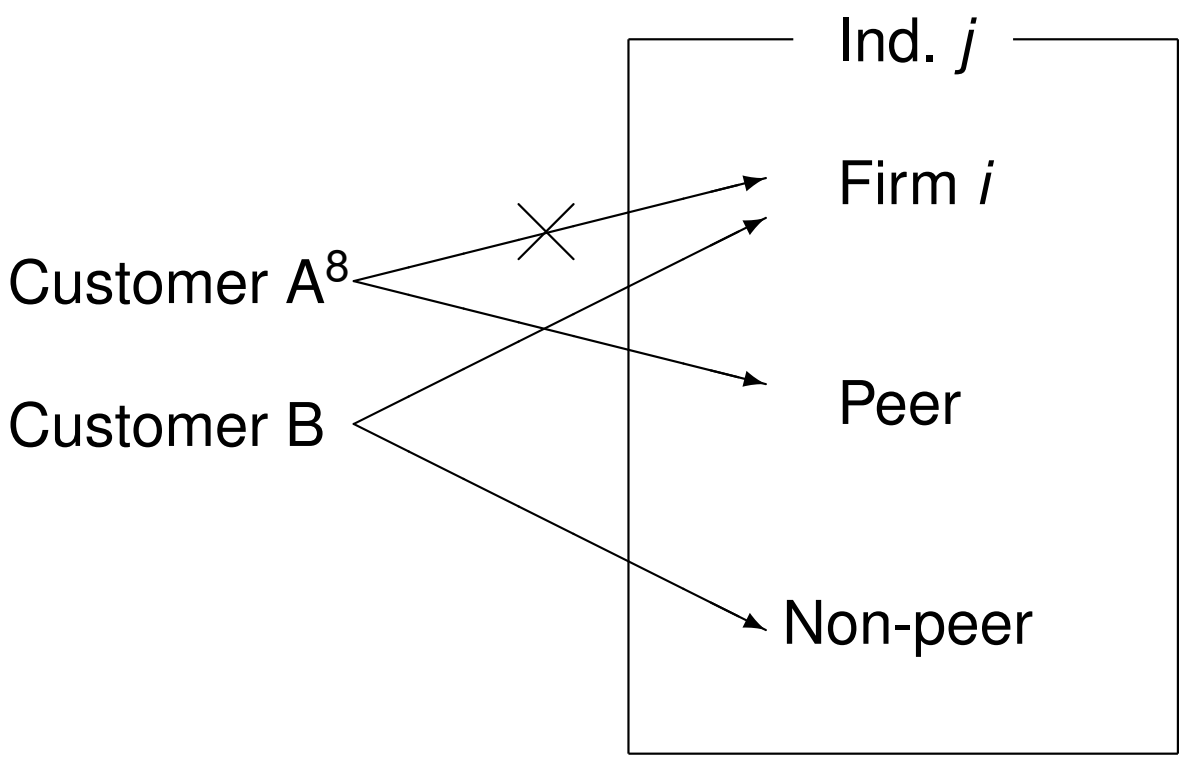
	Peer Firm Average Equity Shock	
	Contemporaneous Independent Vars.	1-Period-Lead Independent Vars.
Firm-Specific Factors		
Log(Sales)	−0.000	−0.000
	(−0.565)	(−0.334)
Market-to-Book	−0.001	0.000
	(−1.444)	(0.104)
EBITDA/Assets	−0.009*	−0.000
	(−2.336)	(−0.048)
Net PPE/Assets	0.008	0.004
	(1.934)	(0.994)
Peer Firm Average Characteristics	Yes	Yes
Firm i Equity Return Shock	Yes	Yes
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Obs.	80,279	80,119
Adj. R^2	0.128	0.127

Tab4. Peer Effects: Reduced-Form Estimates

PanA. Financial Policy

	Market Leverage (1)	Book Leverage (2)	Δ Market Leverage (3)	Δ Book Leverage (4)	Equity Issuance (5)	Debt Issuance (6)	(Issuers) Debt Issuance (7)
			Panel A: Financial Policy				
Peer Firm Averages							
Equity Shock	−0.024**	−0.016**	−0.020**	−0.008**	0.021*	−0.029*	−0.034*
	(−4.965)	(−3.997)	(−6.312)	(−3.109)	(2.440)	(−2.469)	(−2.313)
Log(Sales)	−0.002	−0.002	0.030**	0.009*	−0.008*	0.008	0.014**
	(−0.869)	(−0.994)	(5.941)	(2.398)	(−2.295)	(1.790)	(2.810)
Market-to-Book	0.001	0.001	−0.001	−0.001	0.024**	0.030**	−0.011
	(0.314)	(0.426)	(−0.431)	(−0.343)	(4.817)	(5.079)	(−1.505)
EBITDA/Assets	0.045	0.118**	−0.026	−0.021	0.038	0.357**	0.306**
	(1.574)	(4.666)	(−1.475)	(−1.377)	(0.909)	(7.130)	(4.840)
Net PPE/Assets	0.078**	0.025	0.057*	0.050*	0.066	−0.008	−0.006
	(2.700)	(1.005)	(1.972)	(2.392)	(1.836)	(−0.192)	(−0.131)
Firm-Specific Factors							
Equity Shock	−0.008**	−0.002	0.001	−0.002	0.062**	0.020**	−0.052**
	(−5.812)	(−1.624)	(1.317)	(−1.844)	(21.199)	(6.282)	(−12.219)
Log(Sales)	0.010**	0.010**	0.016**	0.006**	−0.012**	0.014**	0.024**
	(9.260)	(10.812)	(8.071)	(3.274)	(−9.353)	(11.251)	(13.173)
Market-to-Book	−0.053**	−0.014**	−0.002**	−0.002**	0.077**	0.005*	−0.071**
	(−43.272)	(−11.384)	(−3.500)	(−3.057)	(35.226)	(2.421)	(−28.260)
EBITDA/Assets	−0.308**	−0.231**	−0.033**	−0.024**	−0.258**	−0.041**	0.161**
	(−28.937)	(−20.865)	(−5.400)	(−3.511)	(−17.546)	(−2.689)	(7.991)
Net PPE/Assets	0.161**	0.195**	0.068**	0.053**	0.042**	0.185**	0.086**
	(12.007)	(16.169)	(6.851)	(5.685)	(3.094)	(12.220)	(4.422)
Industry Fixed Effects	Yes	Yes	No	No	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	80,279	80,279	80,279	80,279	80,279	80,279	35,363
Adj. R^2	0.31	0.20	0.10	0.01	0.16	0.05	0.27

Different Approach for Peer Groups



[8] Cohen and Frazzini (2008)

Tab5. Customer-Supplier Tests

PanA. Customer Return Shocks

	Market Leverage (1)	Δ Market Leverage (2)	Issue Debt (3)
Panel A: Customer Return Shocks			
Avg. Peer Customer Equity Shock	−0.012*	−0.011**	−0.036*
	(−2.398)	(−3.535)	(−2.027)
Industry Avg. Equity Return	−0.044**	0.009**	−0.042**
	(−10.898)	(3.553)	(−3.211)
Peer Firm Averages			
Log(Sales)	0.004*	0.018**	0.002
	(2.339)	(4.978)	(0.589)
EBITDA/Assets	0.062**	0.002	0.130**
	(5.031)	(0.278)	(3.431)
Market-to-Book	0.001	−0.002*	−0.001
	(0.759)	(−2.294)	(−0.216)
Net PPE/Assets	−0.013	0.055**	−0.049
	(−0.842)	(2.942)	(−1.256)
Firm-Specific Factors			
Log(Sales)	0.009**	0.024**	0.027**
	(8.271)	(12.219)	(11.015)
EBITDA/Assets	−0.176**	−0.035**	0.134**
	(−20.583)	(−6.440)	(6.143)
Market-to-Book	−0.039**	−0.003**	−0.062**
	(−39.523)	(−5.795)	(−24.398)
Net PPE/Assets	0.199**	0.063**	0.148**
	(13.153)	(5.366)	(5.701)
Equity Shock	−0.009**	0.004**	−0.044**
	(−6.719)	(3.878)	(−9.187)
Industry Fixed Effects	Yes	No	Yes
Year Fixed Effects	Yes	No	Yes
Obs.	54,599	52,222	21,410
Adj. R^2	0.28	0.08	0.26

Tab6. Leverage Changes by Peer Firm

Lagged Peer Firm	Peer Firm Avg Leverage Change Quantiles					
Avg Equity Shock	1 (Low)	2	3	4	5 (High)	5 − 1
1 (Low)	−0.033**	−0.008**	0.007**	0.021**	0.062**	0.095**
	(−14.176)	(−4.026)	(3.158)	(9.857)	(29.059)	
2	−0.044**	−0.014**	0.007**	0.020**	0.062**	0.106**
	(−18.302)	(−6.574)	(4.348)	(9.665)	(26.558)	
3	−0.042**	−0.014**	−0.000	0.023**	0.066**	0.108**
	(−18.608)	(−7.284)	(−0.253)	(13.002)	(25.001)	
4	−0.047**	−0.013**	0.003	0.017**	0.066**	0.114**
	(−22.532)	(−7.628)	(1.566)	(8.202)	(28.275)	
5 (High)	−0.046**	−0.024**	0.006**	0.016**	0.062**	0.108**
	(−27.376)	(−11.640)	(2.644)	(7.327)	(24.489)	
5 − 1	−0.014**	−0.016**	−0.000	−0.005	−0.000	

Potential Mechanisms behind Peer Effects

- Market competition.[9]
- Rational herding models.[10]
  - Free-riding in information acquisition or evaluation.[11]
  - To infer best choice from peer companies.[12]

[9] Bolton and Scharfstein (1990), Chevalier and Scharfstein (1996)
[10] Devenow and Welch (1996)
[11] Zeckhauser, Patel, and Hendricks (1991)
[12] Devenow and Welch (1996)

Tab9. Which Firms Mimic?

	Credit Rating (2=Yes)	Dividend Payer (2=Yes)	Market Share (2=Large)	Profitability (2=High)	Market-to-Book (2=High)	Whited–Wu Index (2=Cnstrd)
Peer Firm Avg Leverage Change × Group 1	0.073** (5.332)	0.061** (5.312)	0.050** (3.811)	0.056** (4.808)	0.054** (4.056)	0.031* (2.391)
Peer Firm Avg Leverage Change × Group 2	0.027** (3.387)	0.046** (4.933)	0.041** (2.861)	0.055** (4.047)	0.056** (4.513)	0.053** (3.639)
First-Stage Multivariate F-stat	37.987**	38.149**	19.528**	23.618**	28.189**	21.081**
Peer Firm Average Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Specific Factors	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	No	No	No	No	No	No
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	80,279	80,279	47,338	55,416	55,418	40,655

Tab10. Which Firms Are Mimicked?

	Change in Market Leverage		
	Profitability	Market Share	Stock Return
Panel A: Do Follower Firms Respond to Leaders?			
Leader Firm Avg Leverage Change	0.076**	0.084**	0.087**
	(5.055)	(6.045)	(3.830)
First-Stage Univariate F-stat	62.913**	92.725**	34.530**
Peer Firm Average Characteristics	Yes	Yes	Yes
Firm Specific Factors	Yes	Yes	Yes
Industry Effects	No	No	No
Year Fixed Effects	Yes	Yes	Yes
Obs.	51,588	43,677	51,590
Panel B: Do Leader Firms Respond to Followers?			
Follower Firm Avg Leverage Change	−0.019	−0.002	−0.088
	(−0.890)	(−0.042)	(−1.711)
First-Stage Univariate F-stat	17.688**	5.235*	6.021*
Peer Firm Average Characteristics	Yes	Yes	Yes
Firm Specific Factors	Yes	Yes	Yes
Industry Effects	No	No	No
Year Fixed Effects	Yes	Yes	Yes
Obs.	53,554	45,529	53,552

Implication and Further Studies

- Peer firms are determinants of capital structure.
  - The decision (action) of peer firms are important.
  - The characteristics also matter, to a lesser extent.
- Learning and reputational concerns are motives.
  - Mimicking behavior among
    - Small, young, unsuccessful and financially constrained firms.
    - Following firms.
- Whether the mimicking is optimal?
- How can we model the capital structure with interactions?

Discussion