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14.771 Development Economics: Microeconomic issues and Policy Models

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14.771: Firms and Contracts Lecture 2

Ben Olken

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Overview

- Last lecture: problems in contract enforcement lead to other types of contract enforcement mechanisms (e.g., reputations, networks)
- This lecture: what are the implications of weak contract enforcement for how firms are structured?
 - Business groups.
 - Some problems with business groups (tunneling)
 - Family firms

Business Groups

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- Other theories might also suggest integration across industries (i.e., unrelated production functions)
 - Access to finance also means more may be done within the firm in places where finance is less developed (Rajan and Zingales 1998)
 - Branding/reputations (discussed at the end of last lecture) suggests reasons for firms to integrate across sectors

A diversified business group

Diagram of the Slim Helu Group removed due to copyright restrictions.
See Perkins, Morck, and Yeung (2006).

Conglomerate Size and Financial Development

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 - For each industry, they use US input-output tables to determine how much input from each industry is required to produce a given type of output
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 - For each industry, they use US input-output tables to determine how much input from each industry is required to produce a given type of output
 - They then calculate using each firm's SIC codes what percent of the firm's inputs are produced by industries in which the firm operates
- Findings:
 - Vertical integration is greater in poorer countries, and in countries with greater cost of contract enforcement
 - Also greater in countries with greater entry cost
 - However, this is due almost entirely to industrial composition
- So it's not clear whether other factors cause these industries to be more appropriate for developing countries, or vice-versa

Acemoglu, Johnson, and Mitton Results

- Actual vertical integration

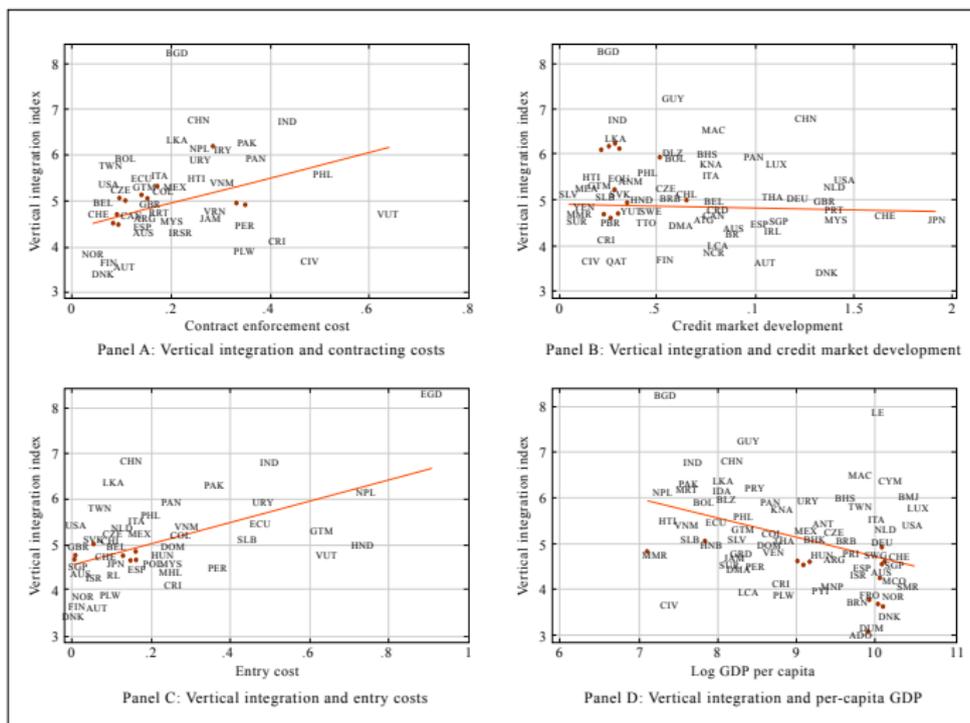


Figure by MIT OpenCourseWare.

Acemoglu, Johnson, and Mitton Results

- Vertical integration predicted by industry mix

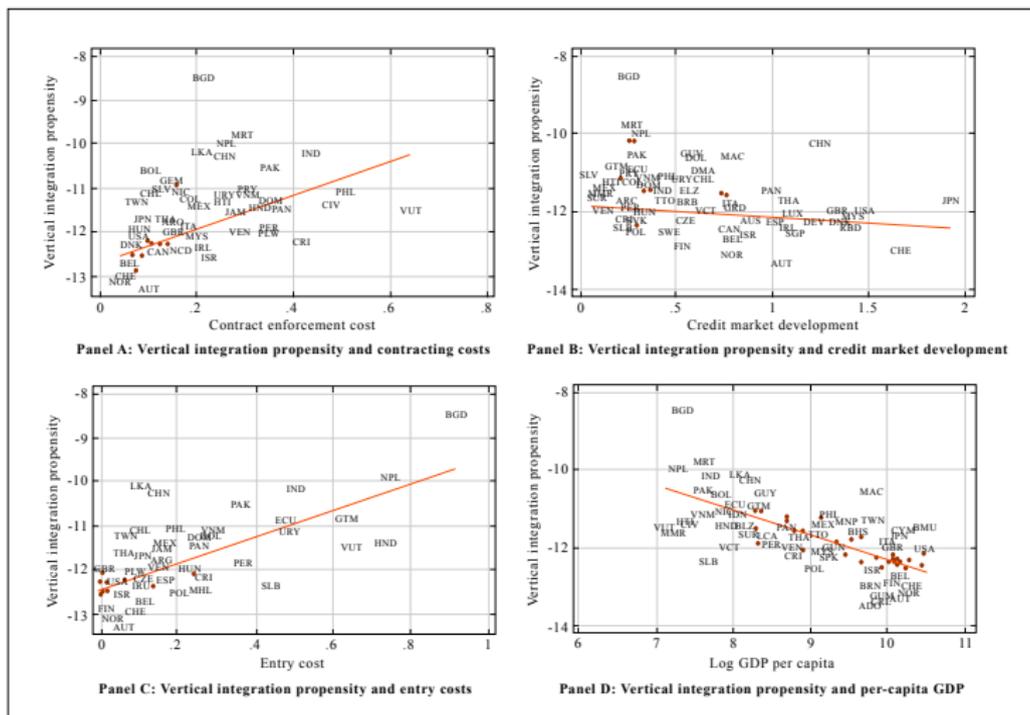


Figure by MIT OpenCourseWare.

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- Data on networks:
 - Authors have data on directors of all Pakistani companies, public and private
 - Define two firms as connected if they share a common director
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- Empirical question:
 - What is the value of being in the super-network?

Constructing a network

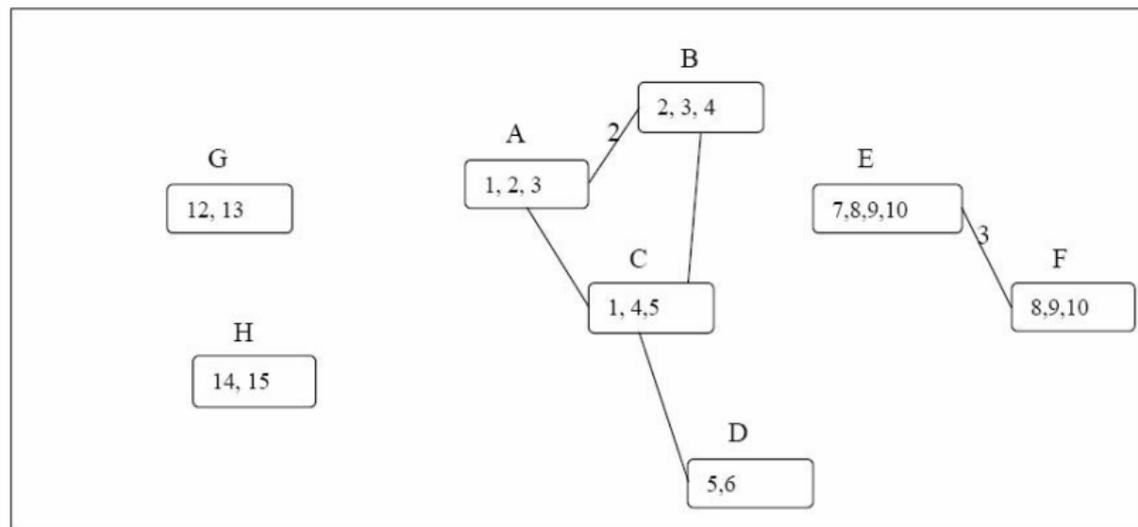
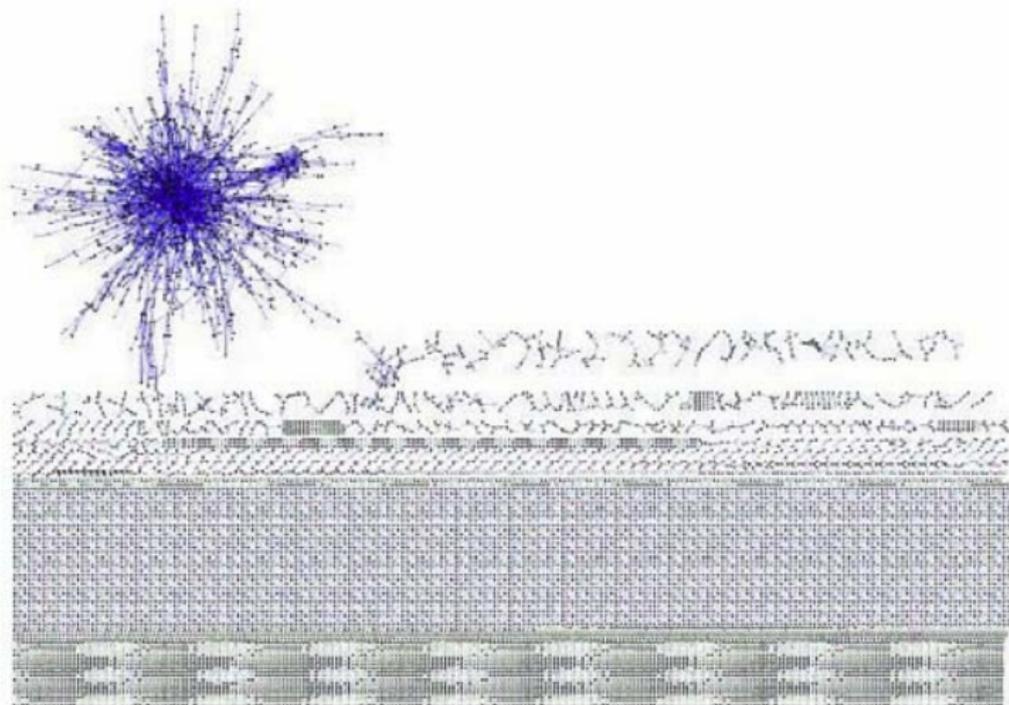


Figure 1. Constructing Networks. This figure illustrates the hypothetical construction of a network. There are 8 firms in the example (A through H), and a total of 15 directors sitting on the board of these firms (labeled 1 through 15). Interlocked board linkages produce two distinct networks and two firms (G and H) that are not connected to anyone else. The largest network consists of firms A through D, where firms A, B and C are linked to each other directly and firm D is linked to firms A and B indirectly through its direct link with C. Thus firms in the same network may be linked to each other through chains of indirect links.

Courtesy of Asim Ijaz Khwaja, Atif Mian, and Abid Qamar. Used with permission.

Networks in the economy



Appendix Figure 1. Network structures in the entire economy. Firms are linked if they share a common director. The spatial positioning of various networks is in order of network size starting with the super-network.

Courtesy of Asim Ijaz Khwaja, Atif Mian, and Abid Qamar. Used with permission.

Empirical strategy

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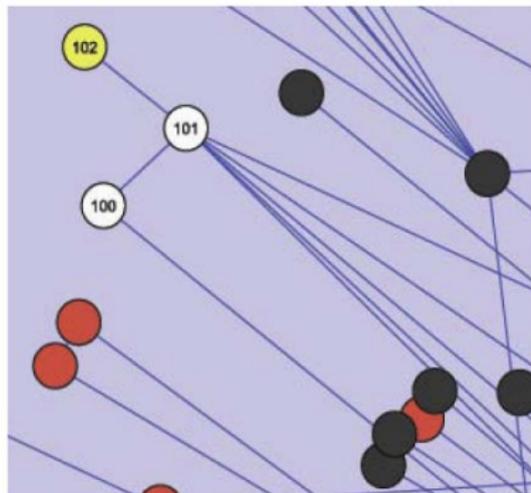
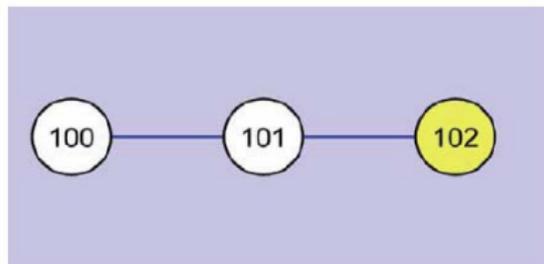
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- Do the same, but with firm fixed effects
 - Where does variation come from?
 - Problem? Sign of bias?
- Empirical idea: use incidental firm entry and exits from the super-network
 - I.e., not whether your firm entered or exited the super-network, but whether another firm in your network entered or exited the supernetwork
 - Problem? Sign of bias?

Empirical strategy



Courtesy of Asim Ijaz Khwaja, Atif Mian, and Abid Qamar. Used with permission.

Results on Borrowing

- Estimate

$$Y_{it} = \alpha_i + \alpha_{kt} + \alpha_t + \gamma \Delta Y_{i,t-1} + \beta_1 \text{ENTRY}_{it} + \beta_1 \text{ENTRY}_{it} * \text{Direct}_i + \varepsilon_{it}$$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
InNetwork	0.166*** (0.043)	0.184*** (0.043)	0.154*** (0.043)	0.177*** (0.043)	0.183*** (0.043)	0.128** (0.059)	0.127** (0.059)
Lagged Loan Growth					0.012*** (0.002)		0.012*** (0.002)
InNetwork * (Direct Entrant/Exitor)						0.126 (0.085)	0.126 (0.085)
Fixed Effects	Basic	Expanded	Basic	Expanded	Expanded	Expanded	Expanded
Observations	286,034	286,034	12,053	12,053	286,034	286,034	286,034
R-squared	0.59	0.60	0.44	0.36	0.60	0.60	0.60

Courtesy of Asim Ijaz Khwaja, Atif Mian, and Abid Qamar. Used with permission.

Results on Probability of Default

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
InNetwork	-1.728*** (0.350)	-1.632 [0.351]***	-1.689*** (0.349)	-1.62*** (0.348)	-1.951*** (0.407)	-1.502*** (0.464)	-1.848*** (0.559)
Lagged Default Rate Growth					0.167*** (0.004)		0.167*** (0.004)
InNetwork * (Direct Entrant/Exitor)						-0.284 -0.702	-0.218 -0.807
Fixed Effects	Basic	Expanded	Basic	Expanded	Expanded	Expanded	Expanded
Observations	397,416	397,416	15,043	15,043	254,576	397,416	254,576
R-squared	0.86	0.86	0.1	0.002	0.86	0.86	0.86

Courtesy of Asim Ijaz Khwaja, Atif Mian, and Abid Qamar. Used with permission.

Note: coefficients multiplied by 100

Mechanisms

	(1)	(2)	(3)	(4)	(5)
	Average Loan Size	Total number of creditors	%age credit from government banks	%age credit from private banks	New Credit Share from Neighbors' Lenders
InNetwork	0.139*** (0.041)	0.137*** (0.018)	-0.014*** (0.003)	0.025*** (0.005)	0.120*** (0.005)
Constant	6.412*** (0.021)	1.041*** (0.004)	0.294*** (0.002)	0.51*** (0.002)	0.211*** (0.005)
Fixed Effects	Expanded	Expanded	Expanded	Expanded	Expanded
Observations	286,034	286,034	286,034	286,034	30,065
R-squared	0.57	0.86	0.9	0.86	0.88

Courtesy of Asim Ijaz Khwaja, Atif Mian, and Abid Qamar. Used with permission.

Bertrand, Mehta, and Mullainathan (2002)

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 - Control rights are awarded to whoever has a majority
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- Control rights over a firm and cash flow rights over firm's profits are not identical:
 - Control rights are awarded to whoever has a majority
 - Cash flow rights are awarded in proportion to ownership
- With pyramid ownership structures, these can be totally separated:
 - Principal owns 51% of company i
 - Company i owns 51% of company $i + 1$
 - As $i \rightarrow \infty$ principal retains complete control but has 0 cash flow rights

Tunneling

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 - Give loans to other firms in groups at artificially high/low interest rates
 - Sell assets to other firms in the group at artificially high/low prices
 - Etc

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- Why do we care?
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- Why do we care?
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 - This offsets the potential benefits of business groups discussed above
- Point of this paper is to detect tunneling

- Idea: Consider external shock to predicted profits, and examine how actual profits respond to predicted profits
- Predictions:
 - Actual profits should respond less to predicted profits if firm is in a group
 - Response is smaller the lower the cash flow rights of the controlling firm
 - Controlling firm's profits should be more responsive to the bottom firm's shocks than their cash flow rights would imply
 - Response is greater if they have low cash flow rights
 - (this I don't see—seems to ignore actual profits)
 - Asymmetry: bottom firms profits are not sensitive to top firm's shocks
 - This distinguishes tunneling from insurance

- Outcome: Profits Before Interest Depreciation and Taxes (PBIDT)
- Shocks: Average asset-weighted industry returns (excluding your firm)
 - Why exclude your firm?
- Cash flow rights:
 - Measure direct cash flow rights with several proxy variables:
 - Cash flow rights of directors (likely to be from the controlling group)
 - Cash flow rights of "other shareholders" (not directors, financial institutions, government bodies, corporate bodies, nor top fifty shareholders)
 - No measure of indirect cash flow rights (i.e., cash flow through intermediate firms)
 - Does this matter?

Regressions and Results

- Question 1: sensitivity to own shocks

$$\pi_{kt} = a + b(pred_{kt}) + c(cash_k * pred_{kt}) + dX_{kt} + \alpha_k + \alpha_t + \varepsilon_{kt}$$

TABLE II
SENSITIVITY TO OWN SHOCK: GROUP VERSUS STAND-ALONE
DEPENDENT VARIABLE: PROFIT BEFORE DIT

	(1)	(2)	(3)	(4)
Own shock	1.05 (.02)	.10 (.05)	-4.58 (.48)	-5.10 (.47)
Own shock* group	-.30 (.02)	-.30 (.02)	-.26 (.02)	-.27 (.02)
Ln assets	.16 (.32)	2.98 (.34)	-.33 (.33)	2.47 (.34)
Own shock* ln assets	—	.10 (.00)	—	1.0 (.01)
Own shock* year of incorp.	—	—	.003 (.000)	.003 (.000)
Sample size	18600	18600	18588	18588
Adjusted R ²	.93	.93	.93	.93

a. Data Source: Prowess, Centre for Monitoring Indian Economy, for years 1989–1999. All monetary variables are expressed in 1995 Rs. crore, where crore represents 10 million. Sample includes both stand-alone and group firms.

b. All regressions also include year fixed effect and firm fixed effects.

c. Standard errors are in parentheses.

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Regressions and Results

- Question 2: sensitivity to amount of director equity

TABLE III
SENSITIVITY TO OWN SHOCK BY DIRECTOR AND OTHER OWNERSHIP
DEPENDENT VARIABLE: PROFIT BEFORE DIT

	Sample:			
	Groups (1)	Groups (2)	Stand- alones (3)	Stand- alones (4)
Own shock	.713 (.009)	-5.075 (.742)	1.058 (.006)	-4.316 (.518)
Own shock * director equity	.025 (.003)	.030 (.003)	.004 (.001)	.019 (.001)
Ln assets	.052 (.733)	4.261 (.807)	-.590 (.176)	1.568 (.178)
Own shock * Ln assets	—	.118 (.008)	—	.201 (.006)
Own shock * year of incorp.	—	.002 (.000)	—	.002 (.000)
Sample size	7521	7510	11079	11078
Adjusted R ²	.92	.93	.95	.96

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Regressions and Results

- Question 5: Is there asymmetry, i.e., do profits move towards the 'top' firm in the chain?

TABLE V
SENSITIVITY TO GROUP SHOCK BY LEVEL OF DIRECTOR OWNERSHIP IN GROUP
DEPENDENT VARIABLE: PROFIT BEFORE DIT

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Level in group:	Lower ½	Top ½	Below topmost firm		Topmost firm			
Own shock	.62 (.01)	.89 (.02)	.63 (.01)	.63 (.01)	.63 (.01)	1.01 (.02)	1.01 (.02)	1.01 (.02)
Group shock	.013 (.002)	.010 (.002)	.012 (.001)	—	—	.020 (.008)	—	—
Shock below 66th ptile (director equity)	—	—	—	.015 (.002)	—	—	.032 (.012)	—
Shock above 66th ptile (director equity)	—	—	—	.003 (.006)	—	—	.007 (.018)	—
Shock below 33rd ptile (other ownership)	—	—	—	—	-.000 (.004)	—	—	-.013 (.025)
Shock above 33rd ptile (other ownership)	—	—	—	—	.017 (.002)	—	—	.034 (.011)
Sample size	4905	2616	5780	5780	5780	1741	1741	1741
Adjusted R ²	.90	.95	.90	.97	.97	.97	.97	.97

a. Data Source: Prowess, Centre for Monitoring Indian Economy, for years 1989–1999. All monetary variables are expressed in 1995 Rs. crore, where crore represents 10 million.

b. Firms are separated into different 'Level in group' based on their within-group level of director equity. For example, "Topmost Firm" are the set of firms that have the highest level of director ownership in their group.

c. Also included in each regression are the logarithm of total assets, year fixed effects, and firm fixed effects.

d. Standard errors are in parentheses.

Family firms

- Many firms are by family members of the original founder.
- A priori, this seems inefficient: why would we think that managerial talent is hereditary? Shouldn't the market find a better manager?
- Why might this be?

- Tunneling!

Burkart, Panunzi, and Shleifer (2003)

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- Assume no superior manager has resources to buy firm outright

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- Tunneling!
- Assume no superior manager has resources to buy firm outright
- Then:
 - If shareholder protections are strong, then you can sell all your stock in the company, and it is run with diversified ownership.
 - If shareholder protections are intermediate, you sell some stock but continue to be a large shareholder, and monitor the professional manager to limit expropriation.
 - If shareholder protections are very weak, so even a manager can expropriate a large shareholder, you retain control within the family.

Perez-Gonzalez (2006)

- What is the impact of inherited management on firm performance? Is it actually negative (as above model suggests)?

- What is the impact of inherited management on firm performance? Is it actually negative (as above model suggests)?
- Idea:
 - Look at firms that were initially controlled by a family, and where there was a CEO succession
 - Compare stock returns for those firms that announce family member will be new CEO with those that announce external new CEO
 - Similarly compare change in actual profits before and after new CEO takes over

Stock-market event studies

- Stock market event studies:
 - Basic idea: efficient markets hypothesis implies that the full long run value of new information on a firm is incorporated in the stock price immediately
 - So the change in a stock's price right around the time of new information tells you the value of that new information

Stock-market event studies

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- Development examples:
 - Fisman (2001) studies effect of Suharto's health on connected firms to determine the value of political connections
 - Guidolin and La Ferrara (2007) studies impact of conflict shocks on mineral firms to detect illegal diamond trade

- Estimation:
 - Estimate a market model to find "abnormal returns" for a firm, i.e. take the residuals from

$$r_f = \alpha + \beta r_m + \varepsilon_f$$

- Define a window around the event e .
 - Then estimate average abnormal returns during the event window e and test the null that they are equal to 0.
- What do we learn from these models? When might they be reasonable? When might they not be reasonable?

TABLE 3—CUMULATIVE ABNORMAL RETURNS AROUND SUCCESSION ANNOUNCEMENTS

Firms and event-window	Type of succession			Difference	Mann-Whitney z -values
	All	Family	Unrelated		
	(1)	(2)	(3)	(4)	(5)
All CEO successions (t_0, t_{+2})	0.0100 (0.0044) [335]	-0.0018 (0.0071) [122]	0.0167 (0.0055) [213]	-0.0184 (0.0089)	1.265
All CEO successions (t_0, t_{+5})	0.0096 (0.0047) [335]	-0.0016 (0.0068) [122]	0.0160 (0.0063) [213]	-0.0176 (0.0093)	1.585
Successions reported as “retirements” (t_0, t_{+2})	0.0096 (0.0049) [260]	-0.0020 (0.0083) [97]	0.0165 (0.0060) [163]	-0.0185 (0.0103)	1.121

Courtesy of the American Economic Association. Used with permission.

Also examines changes in accounting profits

Years	All	Family	Unrelated	Difference
	(1)	(2)	(3)	(4)
Number of CEO transitions	335	122	213	

A. Operating return on assets (OROA)

(3-year average after) – (3 year average before)	-0.0055 (0.0039)	-0.0188 (0.0059)	0.0021 (0.0050)	-0.0209 (0.0077)
-----------------------------------------------------	---------------------	---------------------	--------------------	---------------------

B. Industry adjusted OROA

(3-year average after) – (3 year average before)	0.0022 (0.0040)	-0.0114 (0.0063)	0.0100 (0.0051)	-0.0213 (0.0081)
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C. Industry and performance adjusted OROA

(3-year average after) – (3 year average before)	0.0071 (0.0037)	-0.0059 (0.0056)	0.0146 (0.0049)	-0.0205 (0.0074)
-----------------------------------------------------	--------------------	---------------------	--------------------	---------------------

($t = -1$) – ($t = -3$)	-0.0121 (0.0041)	-0.0169 (0.0080)	-0.0093 (0.0046)	-0.0076 (0.0093)
($t = +3$) – ($t = -1$)	0.0120 (0.0052)	-0.0003 (0.0097)	0.0191 (0.0059)	-0.0194 (0.0113)

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Concluding thoughts

- Firms are important engines of economic growth
- Problems with contracting and credit lead to unusual corporate structures, with some benefits but also some costs
- But I think there's much more about firms that hasn't been explored much.
- Some things I think are interesting:
 - Business clusters
 - Branding
 - Endogenous adoption of technology
 - Internal firm capital markets
 - Political capture
 - Firm behavior