Governance Transparency and Firm Value: Evidence from Korean Chaebols

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Preamble

- My prior work: Does governance structure matter? How?
  - ↪ Examine variation in the balance of power/control on performance/value
- This paper: Does transparency of governance structure matter? How?
  - ↪ Fixing balance of power/control and change the transparency of ownership and control (via shareholding structure), examine impact on performance/value

Controller Incentives Important but Hard to Observe

- Understanding managerial or controller incentives an important part of investors' due diligence and capital allocation decisions

- Especially important in...
  - ↪ international contexts
  - ↪ contexts with weaker institutions of governance

- Not always easy due to information opacity (availability | complexity)
  - ↪ Source of opacity in business groups: complexity of ownership structure

Ownership Structure Complexity as Source of Opacity

- 40% of listed firms in Western Europe and Asia belong to business groups (Faccio and Lang, 2002; Masulis et al., 2011)

- Controller (e.g., founding family) with control >> economic ownership
  - ↪ pyramids
  - ↪ circular-shareholdings (ownership loops)
  - ↪ weighted voting rights (dual-class shares)

- Incentives conflict vis-á-vis minority shareholders common, but opacity of controller incentives varies across control-enhancing structures
  - ↪ Pyramids and circular holdings facilitate control with little ownership
  - ↪ Circular holdings make true ownership / locus of control less transparent (Bebchuk, Kraakman, and Triantis, 2000)

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Does improving "governance transparency" matter for valuation?

Example: Circular Contribution and Control/Opacity

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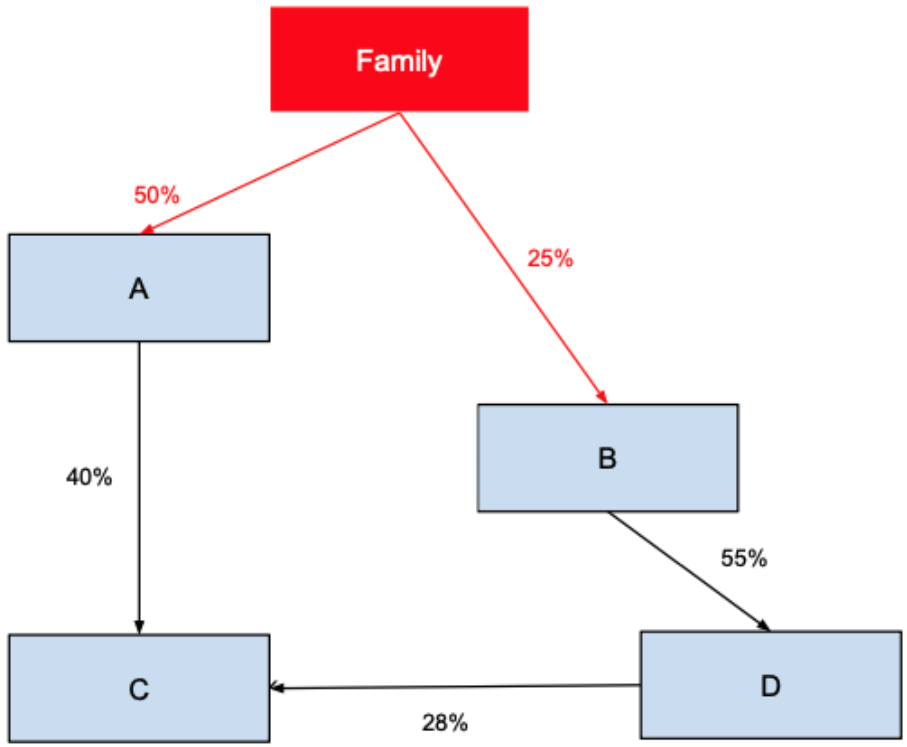

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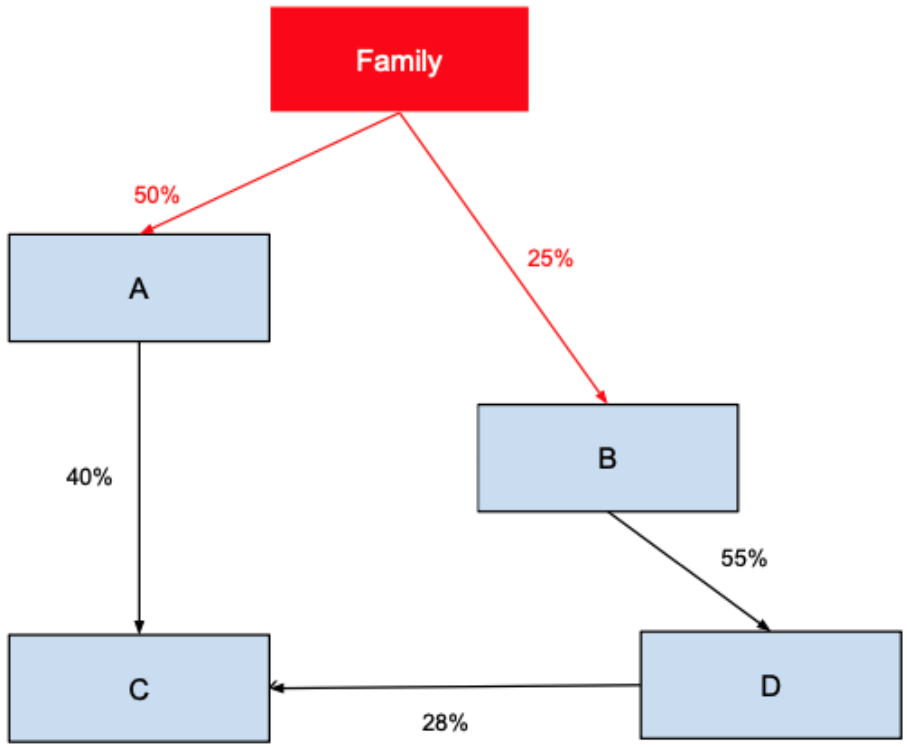

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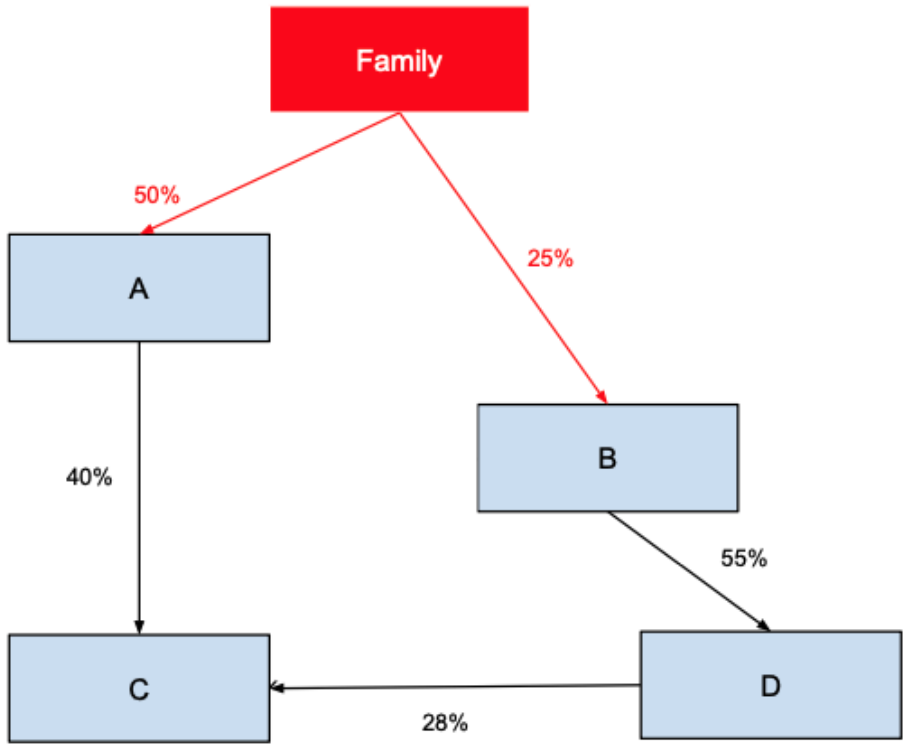

- Family controls A (and all of its votes in C) but does not control B, C, or D
- Cash flow and voting rights relatively easy to determine (follow the ownership chain)

Firm A. 50% of voting rights and CF rights
Firm C. 40% of voting rights and 23.85% CF rights $\Longrightarrow$ 16.15% "wedge"

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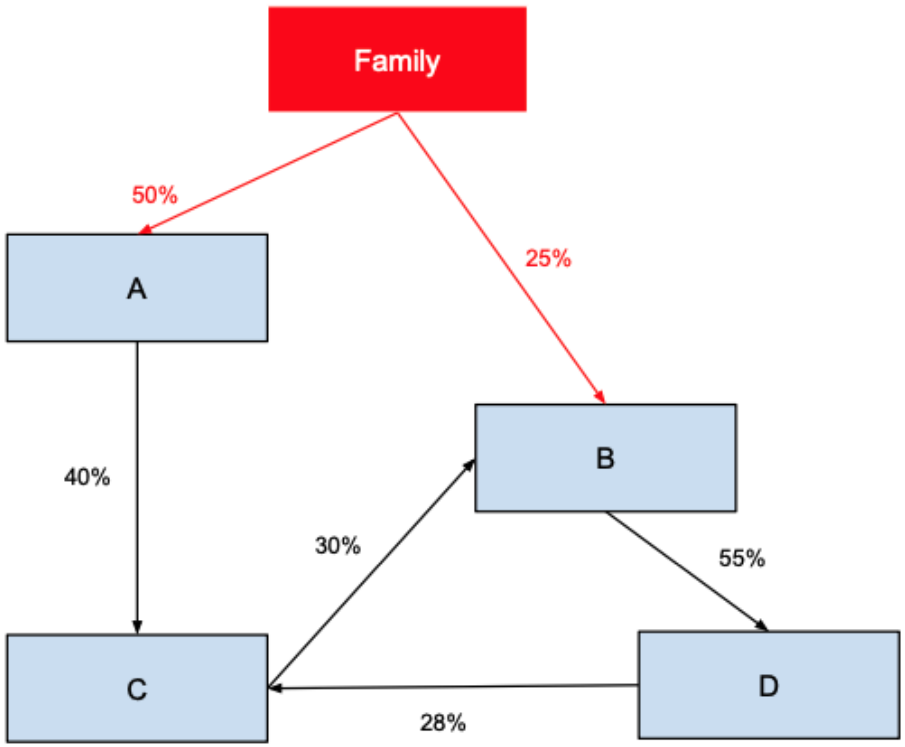

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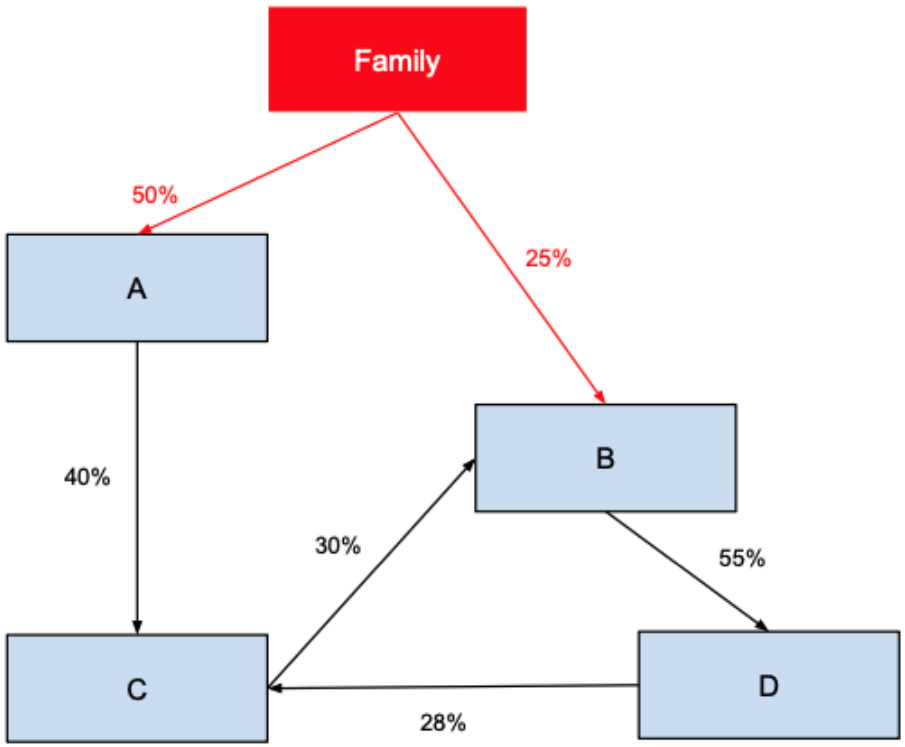

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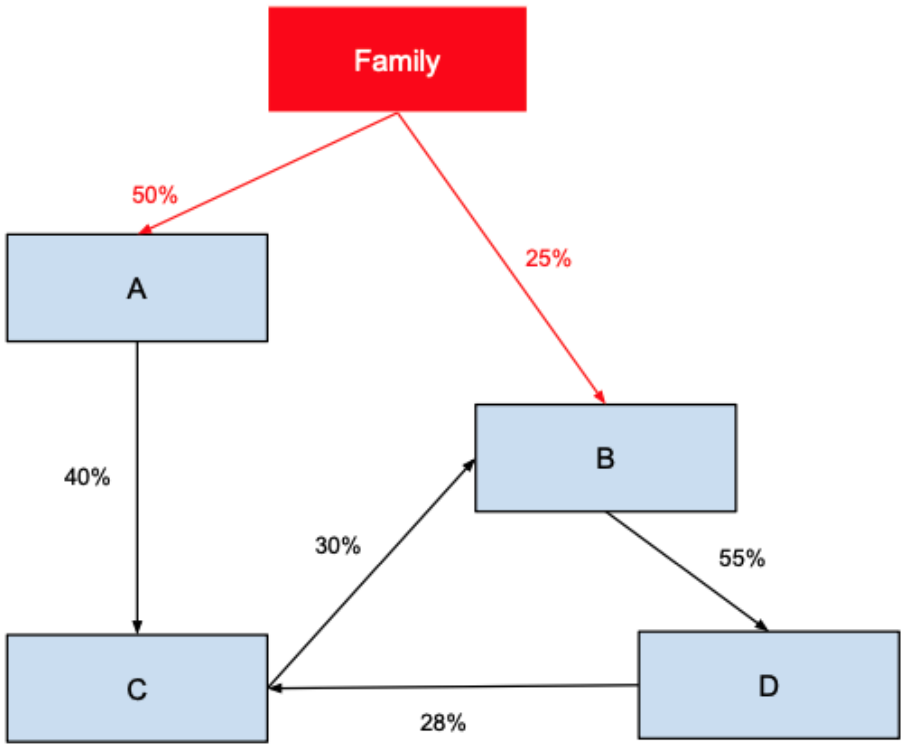

- Family controls A, B, C, and D without additional direct investment
- Cash flow and voting rights complicated to figure out because of circularity

  e.g., Dividend from B $\rightarrow$ C $\rightarrow$ D $\rightarrow$ B
  Need to solve a system of simultaneous equations to determine CF rights

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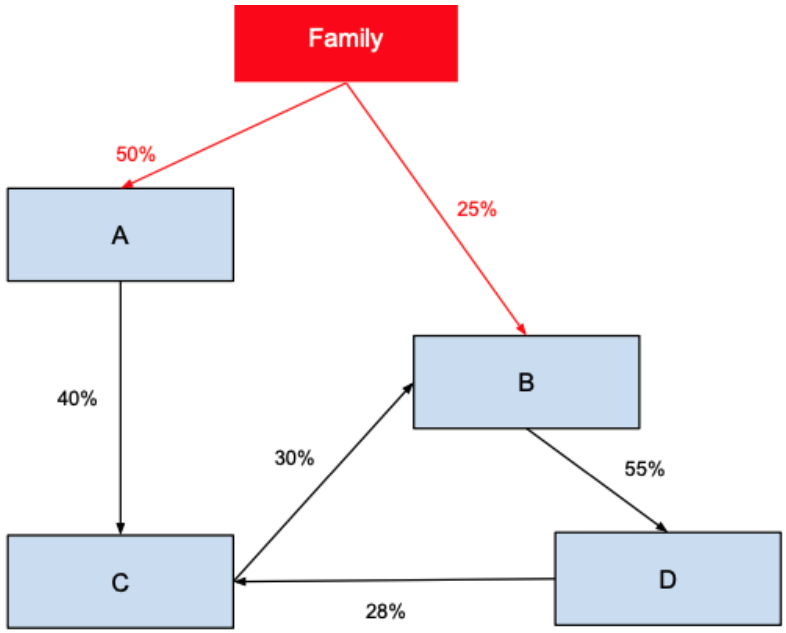
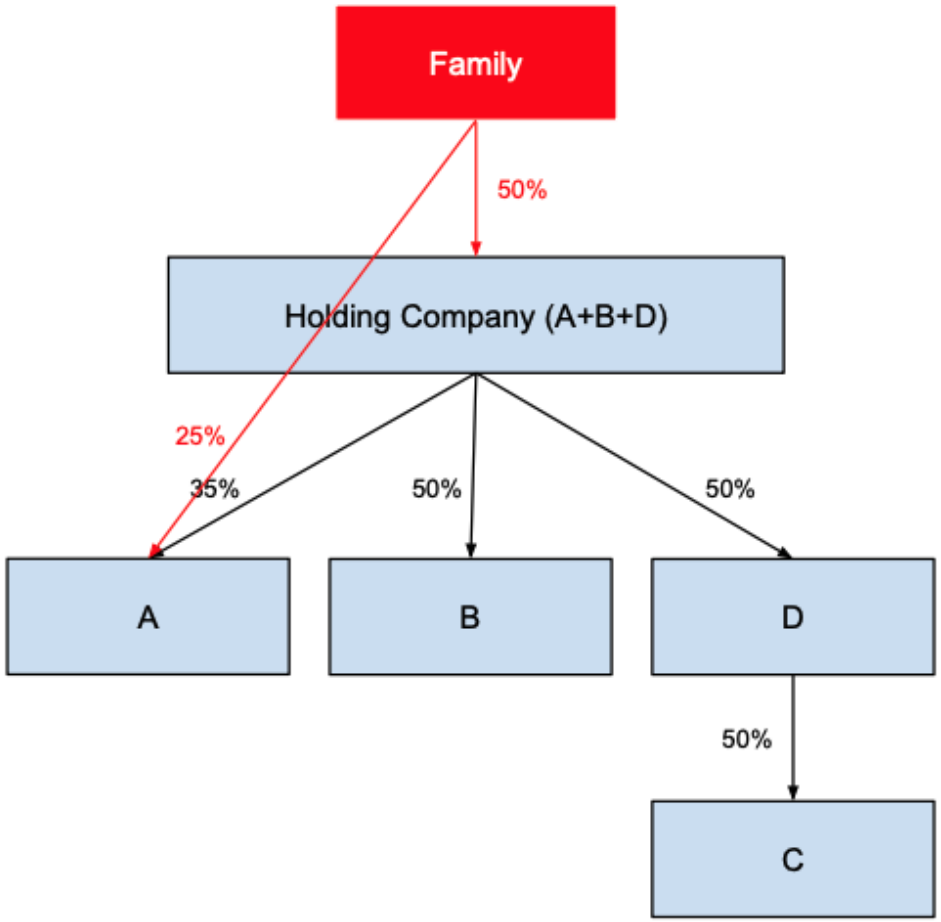


Before	Voting	Cash_Flow	Wedge
A	50.0%	50.0%	0.0%
B	55.0%	32.5%	22.5%
C	68.0%	25.0%	43.0%
D	55.0%	17.9%	37.1%

Wide variation in controller's conflict of interest across different group firms. Not easy for minority investors to figure out where they are more likely to suffer/benefit from expropriation.

Holding Company Structure



- Family retains control over A, B, C, and D through holding company
- Much simpler to understand family's voting and CF rights (follow the ownership chain!)

Korean Setting: Variation of Interest

Transition of Korean business groups or *chaebols* (e.g., Hyundai, Samsung, LG, Lotte) from circular-shareholding to pyramidal structures

- Historically, circular shareholdings a mechanism to help *chaebol* conglomerates grow/diversify while maintaining control
- After 1997 Asian Financial Crisis, Korean regulators began longstanding efforts to reform *chaebols* and aims to improve "governance transparency" by facilitating transition to holding company structure

> "*the existing circular shareholding has disadvantages such as maintaining excessive control of the controlling shareholder and lowering the transparency of the governance structure.*"
>
> "*[Transition to holding company structures serve] to maintain a simple and transparent investment structure.*"

Korean Setting: Data Availability

KFTC collects ownership data for all group firms in each *chaebol*

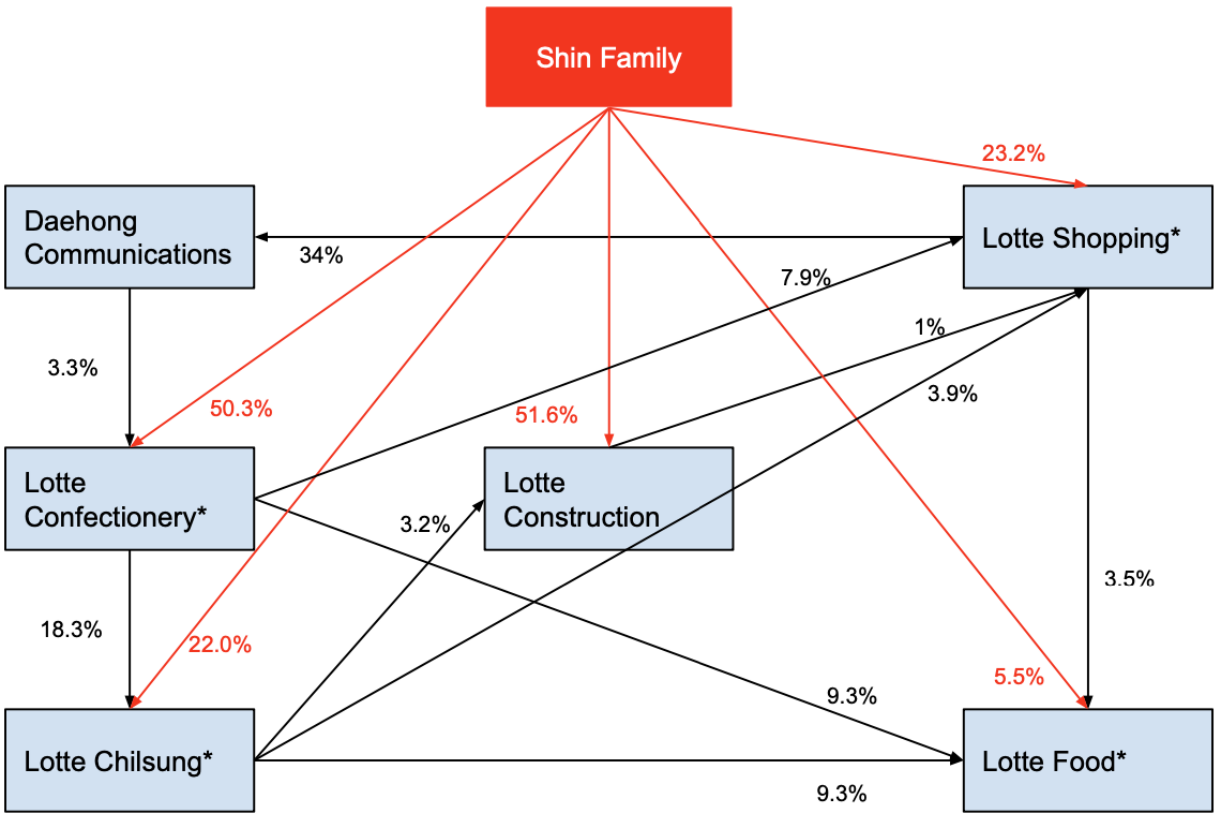
- *Chaebols* identified by ownership of controlling shareholders and affiliate firms, size of combined assets of affiliate firms, and qualitative assessment
- *Chaebol* firms disclose ownership data of controllers and affiliate on April 1 of every year, published online by KFTC since 2007

  ↪ **Worldscope-Datastream**: Accounting+price data, manually matched

  ↪ **Post-2011 Period**: Standardized financial reporting (IFRS adoption by 2011) + vast majority of the transitions

  ↪ **Sample**: ∼1,800 observations, 225 listed *chaebol* firms every year

Actual Example: Lotte 2016-2017



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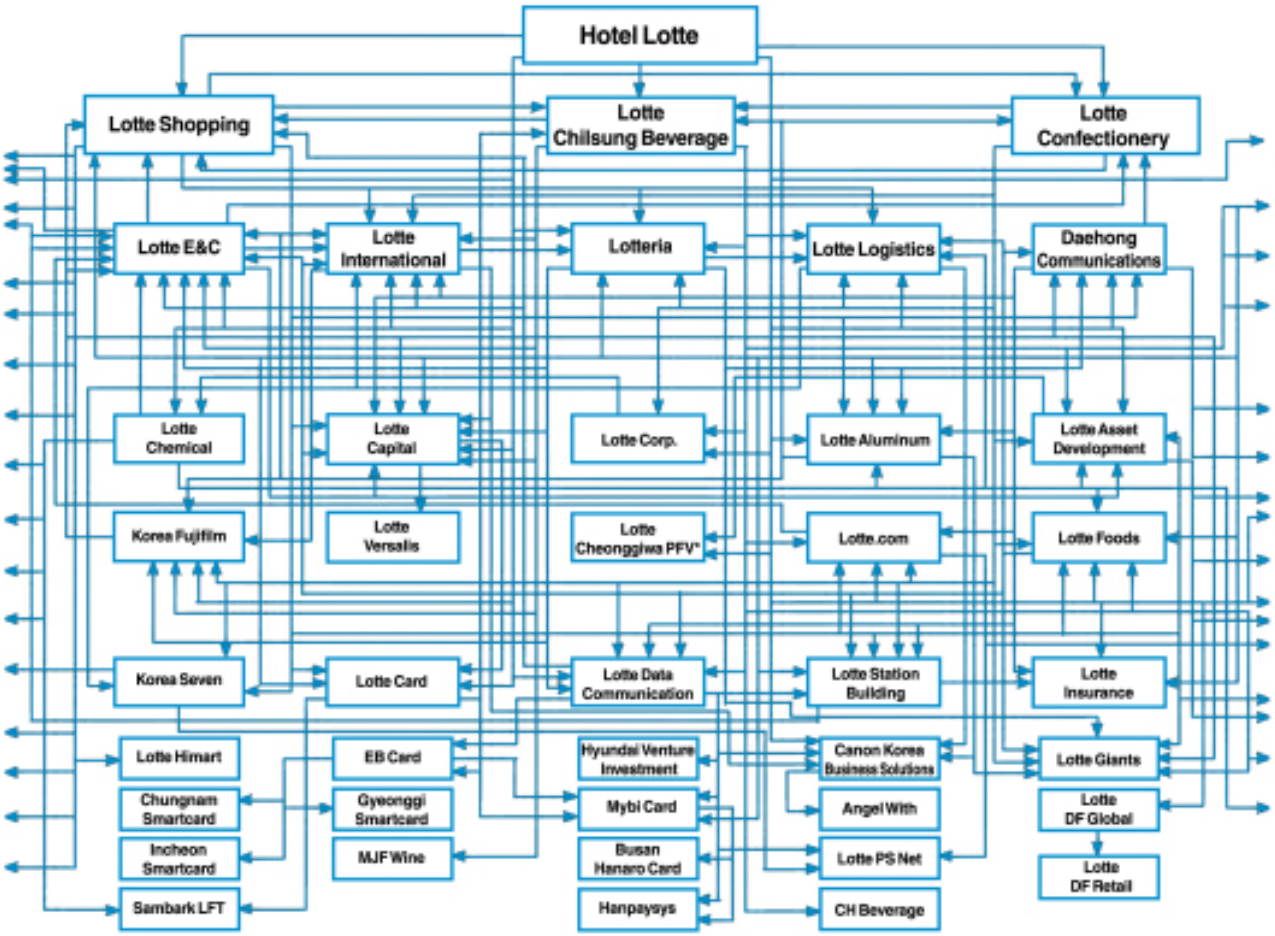

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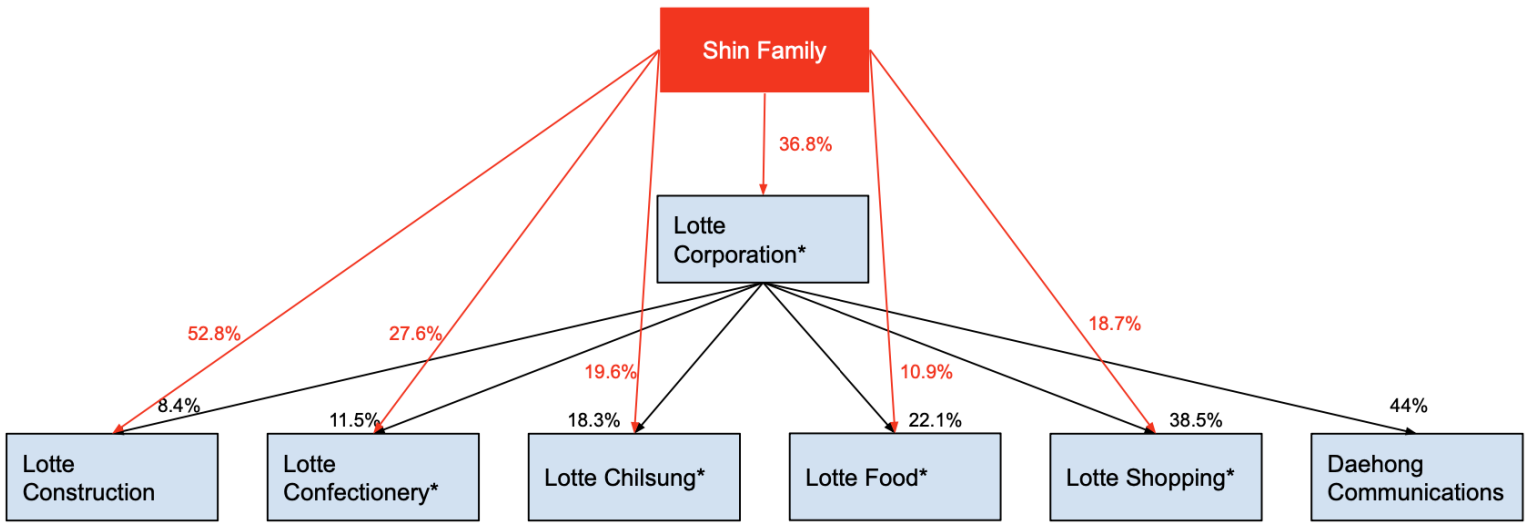
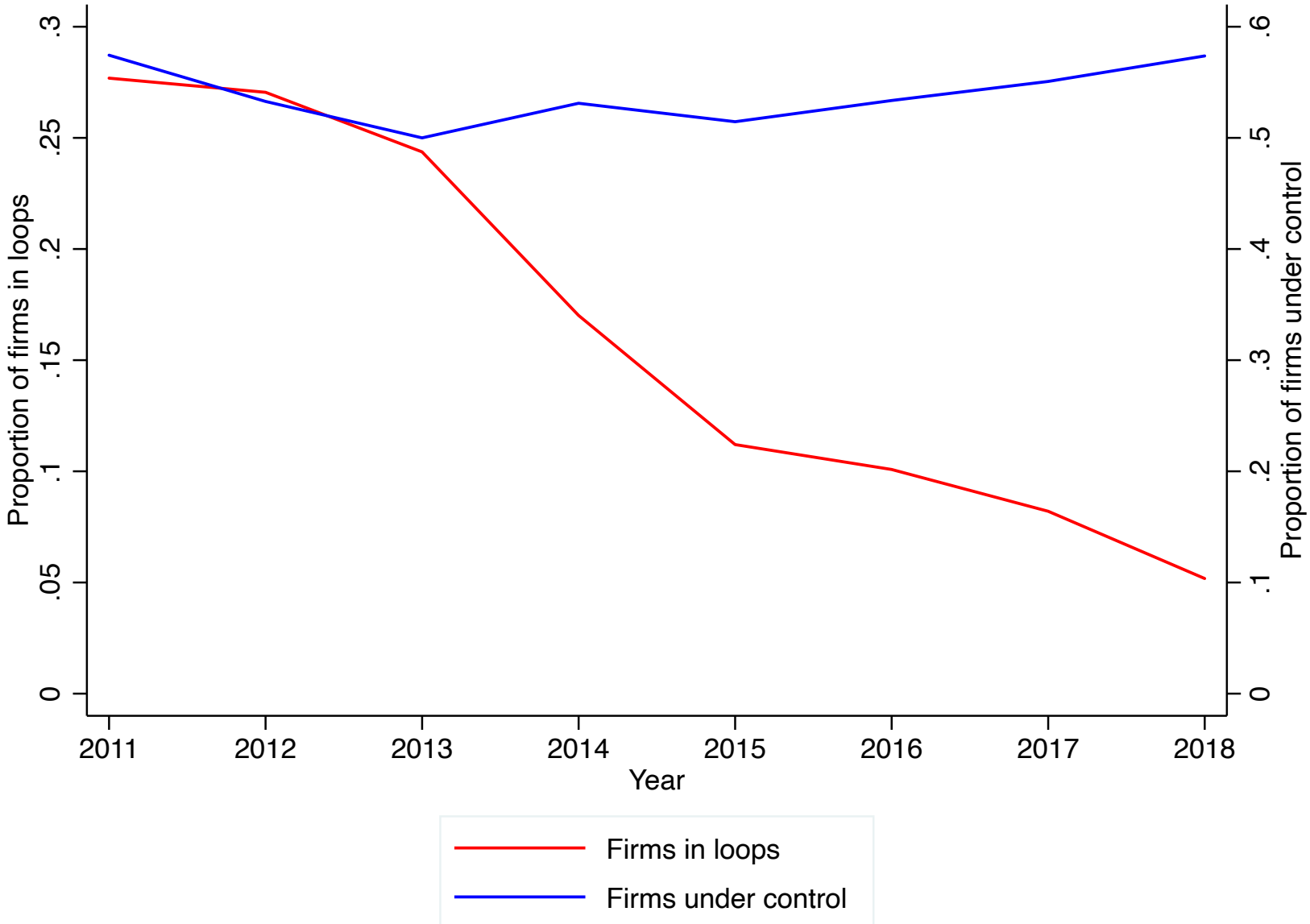
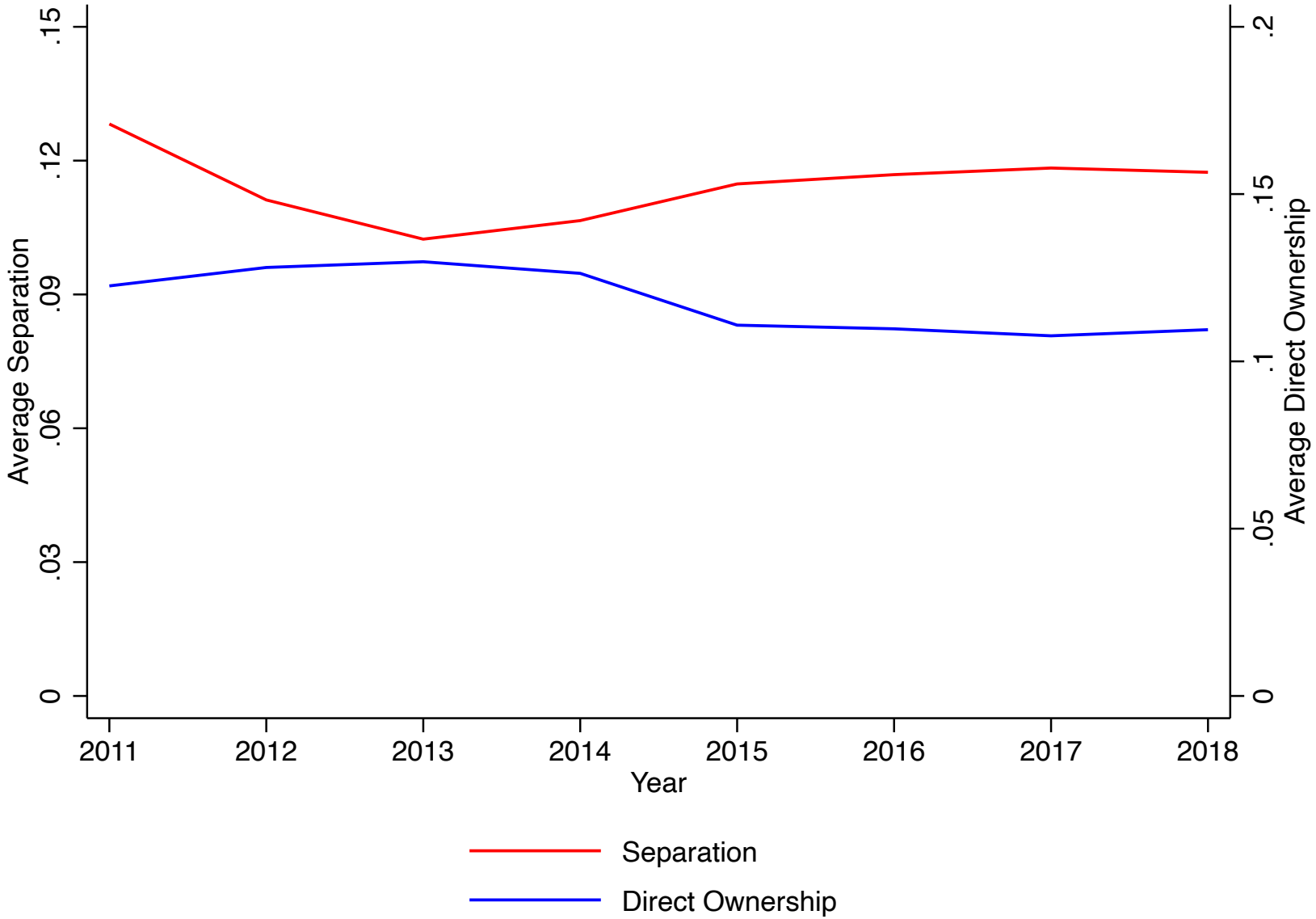


Simplification of Business Group Structure Over Time



Families' Direct Ownership and Incentives Over Time



Research Question

Does improving ownership transparency in business groups matter for valuations of group firms?

↪ Conditional on degree of family control, does it matter if control established through ownership pyramid (transparent) or circular-shareholding (opaque)?

↪ Summary statistics suggest possibility of a "transparency" / "revelation" effect: agency conflicts / managerial incentives across group firms become more apparent (Fischer and Verrecchia, 2000)

Transparency Effect: Two Channels Impacting Valuation

$$P = \underbrace{\frac{P}{\hat{E}(report)}}_{A.} \times \underbrace{\hat{E}(report)}_{B.}$$

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B. "Expected incentives" channel:
revelation leads market to updates priors about firms' incentive conflicts and long-term earnings

↪ If incentives *better* than expected $\Longrightarrow$ *increase* prices
↪ If incentives *worse* than expected $\Longrightarrow$ *ambiguous* effect on prices

Predictions

$$P = \underbrace{\frac{P}{\hat{E}(report)}}_{A.} \times \underbrace{\hat{E}(report)}_{B.}$$

- Transparency effects concentrated in firms with greater degree of ex ante incentive uncertainty (ownership difficult to observe), among which...

  A. Earnings response coefficient (ERC) increase after group simplification

     ↪ Direct test of earnings informativeness channel (Fisher and Verrecchia, '00)

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  B. *positive* value FX in firms where controller has relatively good incentives
     negative|no " " " " " " " " " " poor "

     ↪ Indirect test of the expected incentives channel (Appendix A)

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     ↪ Indirect test of the expected incentives channel (Appendix A)

  B' Use analysts' consensus long-term earnings estimates

     ↪ Direct test of the expected incentives channel
     ↪ But, data limited and unclear whether a good proxy for market expectations

Main Sample: Non-Loop Firms

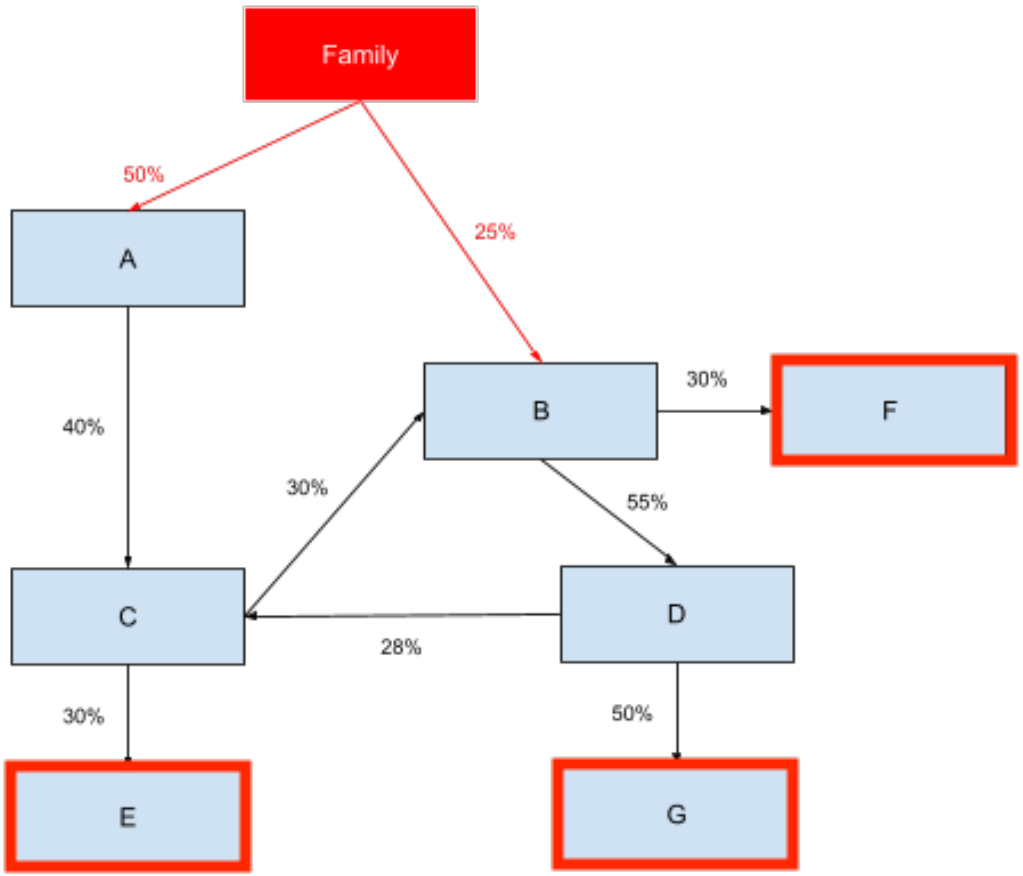
- Non-loop firms: Chaebol firms that were never part of an ownership loop
- Non-loop sample potentially cleaner for testing transparency effects
  - ↪ Transition to holding company structures often required loop firms to engage in complicated M&A or other equity transactions
  - ↪ Loop firms' values more likely to change for reasons unrelated to transparency (e.g., value transfers between group firms involved in the MA or equity swaps) (Lee, 2017)
  - ↪ Loop firms tend to differ substantially in characteristics (Almeida et al., 2011)

Transparency and Non-Loop Firms' Values?

Why would *non-loop* firms' values be impacted?

- ↪ Investors' evaluation of the consequences of controller incentives in one firm depends on how they compare against her incentives in other firms
- ↪ Circular ownership structures obscure controller incentives across group firms, leading investors to form inaccurate expectations about the severity and likely consequences of agency issues
- ↪ Revelation of controlling family incentives in *other* group firms leads investors to update priors about likelihood a particular group firm will benefit or lose due to incentive conflicts

Illustration of Sample



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E	30.0%	7.5%	22.5%
F	30.0%	9.8%	20.2%
G	50.0%	8.9%	41.1%

Empirical analyses focus on non-loop firms (red box) in which there is likely to be a great deal of incentive uncertainty (no direct family ownership or lower in group structure)

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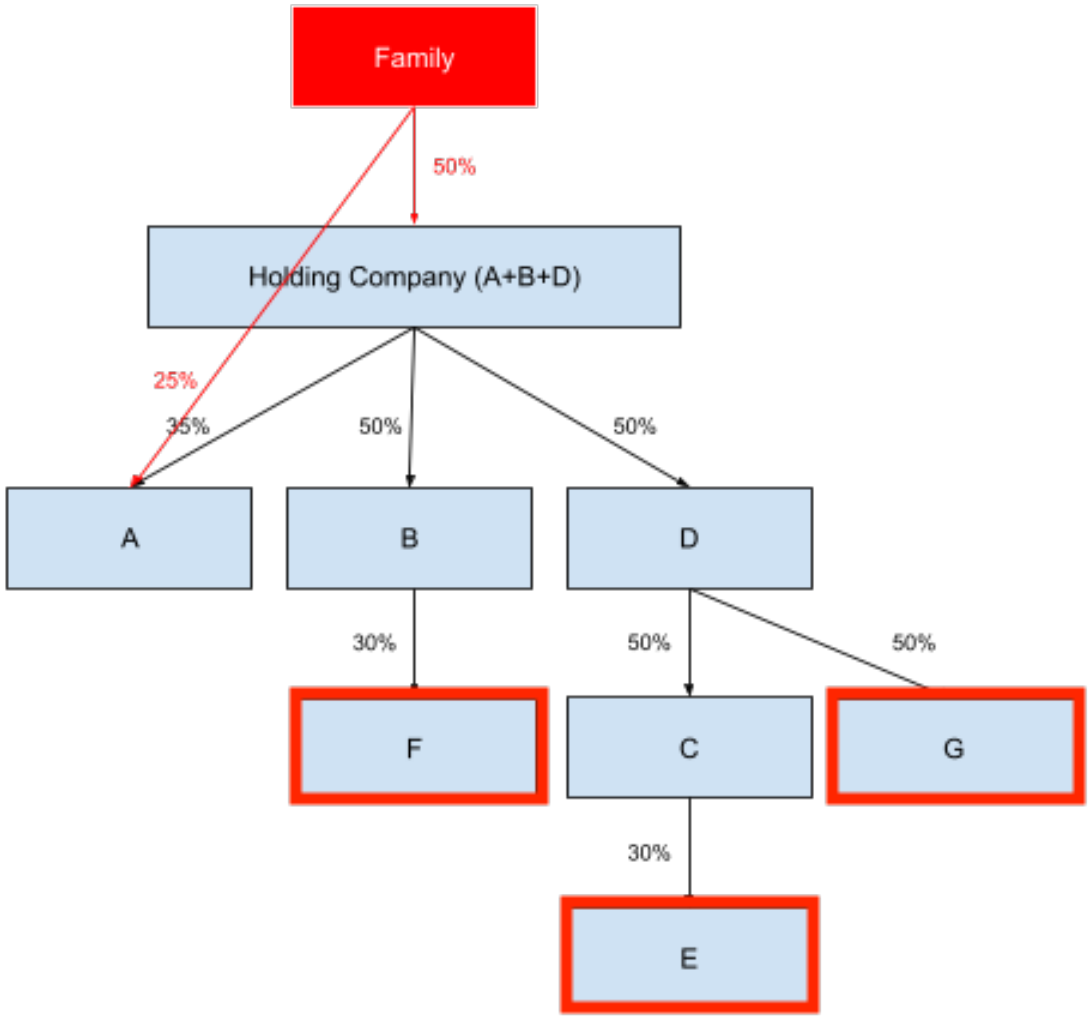
Illustration of Sample



Examine how ERC, value, and long-term earnings estimates change for firms like E, F, G

Earnings Informativeness and Group Simplification (T3)

	Sample				
	All	Lower in Group	Higher in Group	Low Direct Own	High Direct Own
	(1) *Forward CAR*	(2) *Forward CAR*	(3) *Forward CAR*	(4) *Forward CAR*	(5) *Forward CAR*
Removal Fraction × *Forward SUE*	0.592**	1.162***	-0.157	1.107***	0.070
	(0.29)	(0.25)	(0.84)	(0.37)	(0.72)
Forward SUE	0.029	0.012	0.045	0.014	0.059
	(0.02)	(0.01)	(0.04)	(0.02)	(0.04)
Removal Fraction	0.062*	0.099	0.075	0.157	0.059
	(0.03)	(0.08)	(0.05)	(0.10)	(0.04)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	699	234	459	326	365
R-sq	0.0374	0.0386	0.0386	0.0171	0.0378

nb. Forward SUE (*Forward CAR*) is unexpected earnings (abnormal returns) in the next annual earnings announcement; *Removal Fraction* is ratio of loop-removals to total # group firms, capturing degree of structure simplification

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Particularly non-loop firms with greater ex ante incentive uncertainty (the lowest level of observability in the presence of ownership loops)

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Firm Value (Tobin's Q) and Group Simplification (T4)

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*	(5) *Forward Q*	(6) *Forward Q*
Removal Fraction	0.521	0.337	2.507**	2.438**	-1.256*	-1.233
	(0.38)	(0.43)	(1.09)	(1.05)	(0.67)	(0.95)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	497	666	177	235	315	425
R-sq	0.4856	0.4904	0.6204	0.5838	0.5211	0.6054

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Value increases (decreases) in good (bad) incentive firms

Consistent with investors making an "on average" assessment about family incentives in low-observability firms, and transparency allowed them to update priors closer to reality

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Firm Value (Stand-Alone Q) and Group Simplification (T5)

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Forward Q**	(2) *Forward Q**	(3) *Forward Q**	(4) *Forward Q**	(5) *Forward Q**	(6) *Forward Q**
Removal Fraction	0.195	0.000	1.649*	1.627*	-1.305**	-1.451**
	(0.22)	(0.15)	(0.98)	(0.95)	(0.62)	(0.66)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	479	650	170	226	305	417
R-sq	0.4576	0.4866	0.6035	0.5831	0.4971	0.6089

nb. Stand-Alone Q removes removes the influence of affiliates when measuring Tobin's Q, following Almeida et al. (2011)

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Firm Value (Stand-Alone Q) and Group Simplification (T5)

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Forward Q**	(2) *Forward Q**	(3) *Forward Q**	(4) *Forward Q**	(5) *Forward Q**	(6) *Forward Q**
Removal Fraction	0.195	0.000	1.649*	1.627*	-1.305**	-1.451**
	(0.22)	(0.15)	(0.98)	(0.95)	(0.62)	(0.66)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	479	650	170	226	305	417
R-sq	0.4576	0.4866	0.6035	0.5831	0.4971	0.6089

nb. Stand-Alone Q removes removes the influence of affiliates when measuring Tobin's Q, following Almeida et al. (2011)

HBS

Firm Value (Stand-Alone Q) and Group Simplification (T5)

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Forward Q**	(2) *Forward Q**	(3) *Forward Q**	(4) *Forward Q**	(5) *Forward Q**	(6) *Forward Q**
Removal Fraction	0.195	0.000	1.649*	1.627*	-1.305**	-1.451**
	(0.22)	(0.15)	(0.98)	(0.95)	(0.62)	(0.66)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	479	650	170	226	305	417
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HBS

Firm Value (Stock Returns) and Group Simplification

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Return*	(2) *Return*	(3) *Return*	(4) *Return*	(5) *Return*	(6) *Return*
Removal Fraction	0.300	0.494	2.011*	2.409***	-1.138	-0.799
	(1.13)	(0.97)	(1.11)	(0.63)	(0.79)	(0.79)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	516	689	186	248	324	436
R-sq	0.0721	0.0877	0.0987	0.1284	0.0851	0.1003

nb. Stock returns measured from end of prior-year April to end of current-year April.

Firm Value (Stock Returns) and Group Simplification

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Return*	(2) *Return*	(3) *Return*	(4) *Return*	(5) *Return*	(6) *Return*
Removal Fraction	0.300	0.494	2.011*	2.409***	-1.138	-0.799
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	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
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	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
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Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
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R-sq	0.0721	0.0877	0.0987	0.1284	0.0851	0.1003

nb. Stock returns measured from end of prior-year April to end of current-year April.

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LTE Expectations and Group Simplification (T6)

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Forward LTE Expectations*	(2) *Forward LTE Expectations*	(3) *Forward LTE Expectations*	(4) *Forward LTE Expectations*	(5) *Forward LTE Expectations*	(6) *Forward LTE Expectations*
Removal Fraction	-0.364	-0.441	1.886**	0.452	-0.369	-0.532
	(0.43)	(0.43)	(0.90)	(0.35)	(0.44)	(0.53)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	272	378	86	119	185	258
R-sq	0.3011	0.3109	0.4090	0.4270	0.3441	0.3234

(Weakly) consistent with the expected incentives channel: investors making an "on average" assessment about family incentives in low-observability firms, and transparency allowed them to update priors closer to reality

LTE Expectations and Group Simplification (T6)

	Sample					
	All Firms		Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1) *Forward LTE Expectations*	(2) *Forward LTE Expectations*	(3) *Forward LTE Expectations*	(4) *Forward LTE Expectations*	(5) *Forward LTE Expectations*	(6) *Forward LTE Expectations*
Removal Fraction	-0.364	-0.441	1.886**	0.452	-0.369	-0.532
	(0.43)	(0.43)	(0.90)	(0.35)	(0.44)	(0.53)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
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Robustness Tests: Non-Loop Firms

Value changes in non-loop firms not driven "real" changes associated with group simplification

T7: Controlling family incentive conflicts in and degree of control of group firms did not change for the analysis subsamples

T8: Degree of expropriation (related party transactions, ROA) did not change for the analysis subsamples

T9: Value changes not driven by value transfers in equity transactions (e.g., M&A)

Additional Tests: Loop-Removal Firms (Not In Paper)

Value changes of firms that were removed from loops also consistent with transparency hypothesis

- Negative association between loop removal and firm valuation...
  - ↪ not explained by financial constraints or (actual) expropriation
  - ↪ related to the degree of family's incentive conflicts
- Suggestive of a "transparency" / "revelation" effect: market realizes agency conflicts / managerial incentives in loop firms worse than expected
  - ↪ After loop removal, firms have **higher ERC**
  - ↪ After loop removal, analysts **revise down** long-term earnings expectations

Conclusion

- Novel evidence on the implications of improving ownership transparency
  - ↪ Novel evidence suggesting that ownership transparency impacts value of group firms in ambiguous ways:
    a. improves earnings informativeness
    b. investors may revise long-run earnings upward or downwards
  - ↪ Regulating control-enhancing mechanisms could have valuation implications even in the absence of *actual* changes in degree of control
  - ↪ First to document and analyze the consequences of removal of circular ownership
- Evaluate effects of an important policy effort to address governance issues in Korea
- Build on a rich and diverse literature studying the organization of business groups in international contexts
- Plenty more to learn about longer-run effects and aggregate implications

Who Cares?

- **Investors**: opacity of ownership structure / managerial incentives makes it difficult to understand whether/how much "ripoff incentives"
  (e.g., in Germany, India, Japan, Korea, Thailand, Russia)

- **Financial market regulators**:
  - ownership opacity an unattractive feature of corporate governance, leads to significant discount in equity market
  - more broadly, support policies that make managerial/controller incentives more transparent?

- **Academics/Managers**:
  - speaks to tradeoffs between different control-enhancing structures
  - speaks to broader governance question about the consequences of managerial incentive transparency
    (Fischer and Verrechia, TAR 2000; Ferri, Zheng, and Zou, JAE 2018)

Earlier Last Year...

CFO JOURNAL

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The Morning Ledger: Shell to Simplify Share Structure, Move Headquarters to London Amid Energy Transition

By Kristin Broughton

Shell faces increasing pressure from investors and environmental groups over its carbon emissions.
PHOTO: DAVID PAUL MORRIS/BLOOMBERG NEWS

Good morning. Royal Dutch Shell PLC plans to consolidate its dual British and Dutch structure and relocate its headquarters to London, a move it said would help facilitate returns to shareholders and make it simpler to

Baseline Empirical Design

Question: How is loop removal associated with future valuation and group-family control?

$$Y_{i,t+1} = \alpha + \beta_1 \times \textit{Remove Loop}_{i,t} + \gamma X_{i,t} + \textit{year}_t + \textit{group}_i + \epsilon_{i,t}$$

↪ Firm valuation (*Tobin's Q*)

↪ Family's control/incentives in the firm

- Indicator for family's control of voting rights (*Control*)
- Separation of family's voting and cash-flow rights in the firm (*Incentive Conflict*)
- Importance of a firm as a conduit for family control in other firms (*Centrality*)

nb_1 *Effects relative to other group firms*

nb_2 *Don't have sharp ID strategy, rely on firm controls and fixed effects to guard against confounding effects*

Valuation Effects of Cross-Shareholding Changes (T2)

	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.112**	-0.090**	-0.097***	-0.054**
	(0.04)	(0.04)	(0.03)	(0.02)
ROA			1.663***	0.071
			(0.60)	(0.34)
Log Market-cap			-0.011	0.040
			(0.02)	(0.04)
Log Leverage			-0.102	0.049
			(0.20)	(0.13)
Returns			0.182***	0.126***
			(0.04)	(0.04)
Ultimate Ownership			-0.383*	0.240
			(0.22)	(0.24)
Control			0.003	-0.015
			(0.07)	(0.07)
VR			0.025	-0.088
			(0.20)	(0.18)
Industry FE	No	Yes	Yes	No
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	No	Yes
Group FE	Yes	Yes	Yes	Yes
Observations	1,829	1,829	1,751	1,720
R-sq	0.3567	0.4066	0.4472	0.7892

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	(1) Forward Q	(2) Forward Q	(3) Forward Q	(4) Forward Q
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Industry FE	No	Yes	Yes	No
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	No	Yes
Group FE	Yes	Yes	Yes	Yes
Observations	1,829	1,829	1,751	1,720
R-sq	0.3567	0.4066	0.4472	0.7892

Firms removed from loops experienced relatively lower Q (6-11% lower) in the following year compared to other firms in the same business group

Variation by Fin Constraints and Conflict of Interest (T3)

	Financial Constraint		***Conflicts of Interest***	
	Low Constraint	High Constraint	Low Separation	High Separation
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.181***	-0.031	-0.010	-0.146***
	(0.06)	(0.05)	(0.04)	(0.05)
ROA	1.082*	1.811*	0.584	1.903**
	(0.64)	(1.01)	(0.50)	(0.96)
Log Market-cap	-0.031	-0.001	0.013	-0.021
	(0.03)	(0.02)	(0.02)	(0.03)
Log Leverage	-0.128	0.049	-0.069	0.081
	(0.35)	(0.25)	(0.21)	(0.33)
Returns	0.231***	0.153**	0.105*	0.262***
	(0.05)	(0.06)	(0.06)	(0.06)
Ultimate Ownership	-0.455	-0.603***	2.428**	0.008
	(0.44)	(0.20)	(0.97)	(0.43)
Control	-0.157	0.128	-0.120	0.048
	(0.12)	(0.08)	(0.08)	(0.12)
VR	0.427	-0.032	-2.194***	-0.140
	(0.40)	(0.17)	(0.76)	(0.38)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Observations	817	867	892	856
R-sq	0.5525	0.4259	0.5110	0.5358

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Variation by Fin Constraints and Conflict of Interest (T3)

	Financial Constraint		*Conflicts of Interest*	
	Low Constraint	High Constraint	Low Separation	High Separation
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.181***	-0.031	-0.010	-0.146***
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Industry FE	Yes	Yes	Yes	Yes
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Group FE	Yes	Yes	Yes	Yes
Observations	817	867	892	856
R-sq	0.5525	0.4259	0.5110	0.5358

Valuation decline not concentrated in firms with higher financial constraints, but **more cash rich group firms**

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Variation by Fin Constraints and Conflict of Interest (T3)

	Financial Constraint		*Conflicts of Interest*	
	Low Constraint	High Constraint	Low Separation	High Separation
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.181***	-0.031	-0.010	-0.146***
	(0.06)	(0.05)	(0.04)	(0.05)
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	(0.05)	(0.06)	(0.06)	(0.06)
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	(0.44)	(0.20)	(0.97)	(0.43)
Control	-0.157	0.128	-0.120	0.048
	(0.12)	(0.08)	(0.08)	(0.12)
VR	0.427	-0.032	-2.194***	-0.140
	(0.40)	(0.17)	(0.76)	(0.38)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Observations	817	867	892	856
R-sq	0.5525	0.4259	0.5110	0.5358

Valuation decline not concentrated in firms with higher financial constraints, but **more cash rich group firms**
Valuation decline concentrated in firms with **higher incentive conflicts**

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Control, Incentives, and Expropriation (T4)

	(1)	(2)	(3)	(4)	(5)
	Forward Control	*Forward Separation*	*Forward Net RPT to Assets*	*Forward ROA*	*Forward Q [Low Equity Tranxn Sample]*
Remove Loop	0.040	0.010	0.001	0.001	-0.100**
	(0.03)	(0.01)	(0.03)	(0.01)	(0.04)
ROA	0.062	0.061*	0.474**	0.568***	1.873**
	(0.11)	(0.04)	(0.24)	(0.04)	(0.74)
Log Market-cap	-0.006	-0.007***	-0.007	0.001	-0.004
	(0.00)	(0.00)	(0.02)	(0.00)	(0.02)
Log Leverage	0.020	0.025	-0.432*	0.006	-0.066
	(0.07)	(0.03)	(0.23)	(0.02)	(0.22)
Returns	-0.000	-0.000	-0.008	0.011***	0.146***
	(0.02)	(0.00)	(0.02)	(0.00)	(0.05)
Ultimate Ownership	0.213***	-0.797***	-0.091	-0.010	-0.430*
	(0.07)	(0.04)	(0.16)	(0.01)	(0.24)
Control	0.749***	-0.007	0.050	-0.003	0.006
	(0.04)	(0.01)	(0.05)	(0.00)	(0.08)
VR	-0.061	0.752***	-0.094	0.010	0.023
	(0.07)	(0.04)	(0.13)	(0.01)	(0.22)
Industry FE	No	No	Yes	No	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes
Observations	1,681	1,681	1,295	1,751	1,452
R-sq	0.8004	0.7604	0.2187	0.4570	0.4776

nb. Column 5 excludes firms with more than 5% change in treasury shares

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Control, Incentives, and Expropriation (T4)

	(1)	(2)	(3)	(4)	(5)
	Forward Control	*Forward Separation*	*Forward Net RPT to Assets*	*Forward ROA*	*Forward Q [Low Equity Tranxn Sample]*
Remove Loop	0.040	0.010	0.001	0.001	-0.100**
	(0.03)	(0.01)	(0.03)	(0.01)	(0.04)
ROA	0.062	0.061*	0.474**	0.568***	1.873**
	(0.11)	(0.04)	(0.24)	(0.04)	(0.74)
Log Market-cap	-0.006	-0.007***	-0.007	0.001	-0.004
	(0.00)	(0.00)	(0.02)	(0.00)	(0.02)
Log Leverage	0.020	0.025	-0.432*	0.006	-0.066
	(0.07)	(0.03)	(0.23)	(0.02)	(0.22)
Returns	-0.000	-0.000	-0.008	0.011***	0.146***
	(0.02)	(0.00)	(0.02)	(0.00)	(0.05)
Ultimate Ownership	0.213***	-0.797***	-0.091	-0.010	-0.430*
	(0.07)	(0.04)	(0.16)	(0.01)	(0.24)
Control	0.749***	-0.007	0.050	-0.003	0.006
	(0.04)	(0.01)	(0.05)	(0.00)	(0.08)
VR	-0.061	0.752***	-0.094	0.010	0.023
	(0.07)	(0.04)	(0.13)	(0.01)	(0.22)
Industry FE	No	No	Yes	No	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes
Observations	1,681	1,681	1,295	1,751	1,452
R-sq	0.8004	0.7604	0.2187	0.4570	0.4776

nb. Column 5 excludes firms with more than 5% change in treasury shares

Loop removal not associated with more control or incentive conflicts, lower related party net revenues or *ROA*

HBS

Control, Incentives, and Expropriation (T4)

	(1)	(2)	(3)	(4)	(5)
	Forward Control	*Forward Separation*	*Forward Net RPT to Assets*	*Forward ROA*	*Forward Q [Low Equity Tranxn Sample]*
Remove Loop	0.040	0.010	0.001	0.001	-0.100**
	(0.03)	(0.01)	(0.03)	(0.01)	(0.04)
ROA	0.062	0.061*	0.474***	0.568***	1.873**
	(0.11)	(0.04)	(0.24)	(0.04)	(0.74)
Log Market-cap	-0.006	-0.007***	-0.007	0.001	-0.004
	(0.00)	(0.00)	(0.02)	(0.00)	(0.02)
Log Leverage	0.020	0.025	-0.432*	0.006	-0.066
	(0.07)	(0.03)	(0.23)	(0.02)	(0.22)
Returns	-0.000	-0.000	-0.008	0.011***	0.146***
	(0.02)	(0.00)	(0.02)	(0.00)	(0.05)
Ultimate Ownership	0.213***	-0.797***	-0.091	-0.010	-0.430*
	(0.07)	(0.04)	(0.16)	(0.01)	(0.24)
Control	0.749***	-0.007	0.050	-0.003	0.006
	(0.04)	(0.01)	(0.05)	(0.00)	(0.08)
VR	-0.061	0.752***	-0.094	0.010	0.023
	(0.07)	(0.04)	(0.13)	(0.01)	(0.22)
Industry FE	No	No	Yes	No	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes
Observations	1,681	1,681	1,295	1,751	1,452
R-sq	0.8004	0.7604	0.2187	0.4570	0.4776

nb. Column 5 excludes firms with more than 5% change in treasury shares

Loop removal not associated with more control or incentive conflicts, lower related party net revenues or *ROA*

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Control, Incentives, and Expropriation (T4)

	(1)	(2)	(3)	(4)	(5)
	Forward Control	*Forward Separation*	*Forward Net RPT to Assets*	*Forward ROA*	*Forward Q [Low Equity Tranxn Sample]*
Remove Loop	0.040	0.010	0.001	0.001	-0.100**
	(0.03)	(0.01)	(0.03)	(0.01)	(0.04)
ROA	0.062	0.061*	0.474**	0.568***	1.873**
	(0.11)	(0.04)	(0.24)	(0.04)	(0.74)
Log Market-cap	-0.006	-0.007***	-0.007	0.001	-0.004
	(0.00)	(0.00)	(0.02)	(0.00)	(0.02)
Log Leverage	0.020	0.025	-0.432*	0.006	-0.066
	(0.07)	(0.03)	(0.23)	(0.02)	(0.22)
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	(0.02)	(0.00)	(0.02)	(0.00)	(0.05)
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	(0.11)	(0.04)	(0.24)	(0.04)	(0.74)
Log Market-cap	-0.006	-0.007***	-0.007	0.001	-0.004
	(0.00)	(0.00)	(0.02)	(0.00)	(0.02)
Log Leverage	0.020	0.025	-0.432*	0.006	-0.066
	(0.07)	(0.03)	(0.23)	(0.02)	(0.22)
Returns	-0.000	-0.000	-0.008	0.011***	0.146***
	(0.02)	(0.00)	(0.02)	(0.00)	(0.05)
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Loop removal not associated with more control or incentive conflicts, lower related party net revenues or *ROA*
Value decline not explained by expropriation *during* loop removal process (through acquisition of firms)

HBS

A Transparency Effect?

- Negative association between loop removal and firm valuation...
  - ↪ not explained by financial constraints or (actual) expropriation
  - ↪ related to degree of family's conflicts of interest
- Suggestive of a "transparency" / "revelation" effect: agency conflicts / managerial incentives across group firms become more apparent (Fischer and Verrecchia, 2000)

Transparency Effect: Two Channels Impacting Valuation

$$P = \underbrace{\frac{P}{\hat{E}(report)}}_{A.} \times \underbrace{\hat{E}(report)}_{B.}$$

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A. "Earnings informativeness" channel:
revelation allows investors to get better handle on LT earnings, leading to higher multiple on each dollar of expected earnings

$\Longrightarrow$ Test whether earnings response coefficients (ERC) **increase** after loop removal

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A. "Earnings informativeness" channel:
revelation allows investors to get better handle on LT earnings, leading to higher multiple on each dollar of expected earnings

$\Longrightarrow$ Test whether earnings response coefficients (ERC) **increase** after loop removal

B. "Expected incentives" channel:
revelation leads market to updates priors about firms' incentive conflicts and (non-controlling) shareholders' payoffs

$\Longrightarrow$ Test whether analysts' long-term earnings (LTE) expectations **decline** after loop removal

ERC and LTE Expectations: Loop-Removal Firms (T5)

	(1) *Forward CAR*	(2) *Forward LTE Expectations*
Remove Loop × *Forward SUE*	0.125***	
	(0.05)	
Remove Loop	0.015	-0.017*
	(0.01)	(0.01)
Forward SUE	0.027	
	(0.02)	
Industry FE	Yes	Yes
Time FE	Yes	Yes
Group FE	Yes	Yes
Controls	Yes	Yes
Observations	961	1,095
R-sq	0.0422	0.3380

nb. Forward SUE (*Forward CAR*) is unexpected earnings (abnormal returns) in the next annual earnings announcement

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ERC increases after loop removal (earnings become more informative)
Long-term earnings expectations decline after loop removal (incentives worse than expected)

Summary Statistics (T1)

	p25	*p50*	*Mean*	*p75*	*p95*	*SD*	*Count*
	p25	p50	mean	p75	p95	sd	count
Q	0.88	1.00	1.18	1.24	2.33	0.64	1,843
ROA	0.01	0.04	0.04	0.07	0.16	0.06	1,908
Log market-cap	12.34	13.49	13.60	14.83	16.55	1.67	1,843
Log leverage	0.01	0.09	0.11	0.17	0.28	0.10	1,941
Returns	-0.22	-0.03	0.03	0.18	0.73	0.39	1,790
RPT to assets	0.02	0.06	0.19	0.20	0.95	0.31	1,577
RPT to sales	0.02	0.08	0.17	0.23	0.73	0.23	1,574
Cash-to-Assets	0.05	0.09	0.14	0.17	0.53	0.16	1,881
Debt-to-CF	0.00	1.21	2.87	4.09	16.42	13.12	1,806
Family stake	0.00	0.01	0.12	0.20	0.49	0.19	1,951
Ultimate ownership	0.08	0.17	0.22	0.32	0.57	0.18	1,951
Control	0.00	1.00	0.54	1.00	1.00	0.50	1,951
VR	0.08	0.33	0.32	0.49	0.73	0.24	1,951
Centrality	0.00	0.00	0.05	0.05	0.32	0.11	1,950
Separation	0.00	0.00	0.11	0.22	0.44	0.16	1,951
Position	1.24	2.00	1.96	2.38	3.27	0.81	1,951
Loop	0.00	0.00	0.16	0.00	1.00	0.37	1,951
Remove Loop	0.00	0.00	0.04	0.00	0.00	0.19	1,936
Removal Fraction	0.00	0.00	0.02	0.00	0.10	0.06	1,951

Valuation Effects of Loop-Removal on *Adjusted Q* (T2A)

	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*
Add Loop	-0.099	-0.101	-0.098
	(0.07)	(0.07)	(0.08)
Remove Loop	-0.143**	-0.125**	-0.125***
	(0.06)	(0.06)	(0.05)
ROA			1.949***
			(0.67)
Log market-cap			-0.002
			(0.02)
Log leverage			-0.166
			(0.23)
Returns			0.189***
			(0.05)
Ultimate ownership			-0.728**
			(0.29)
Control			0.018
			(0.09)
VR			0.203
			(0.22)
Industry FE	No	Yes	Yes
Time FE	Yes	Yes	Yes
Group FE	Yes	Yes	Yes
Observations	1,859	1,859	1,710
R-sq	0.2744	0.3201	0.4099

Valuation Effects: Variation by Change in Transparency (T2B)

	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*
Add loop-size	-0.003		
	(0.02)		
Reduce loop-size	-0.023**		
	(0.01)		
Loop dependency		-0.030***	-0.028**
		(0.01)	(0.01)
ROA	1.719***	1.928***	2.425***
	(0.59)	(0.59)	(0.63)
Log market-cap	-0.007	-0.007	-0.024
	(0.02)	(0.02)	(0.03)
Log leverage	-0.106	-0.016	0.318
	(0.20)	(0.20)	(0.33)
Industry FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Group FE	Yes	Yes	Yes
Observations	1,744	1,668	352
R-sq	0.4444	0.4574	0.3723

Other firm controls suppressed for parsimony

Valuation: Variation by Financial Constraints (T3B)

	Cash-to-Assets		*Debt-to-CF*	
	Low Constraint	High Constraint	Low Constraint	High Constraint
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.181***	-0.031	-0.156**	-0.088*
	(0.06)	(0.05)	(0.06)	(0.05)
ROA	1.082*	1.811*	1.209*	2.809***
	(0.64)	(1.01)	(0.62)	(1.07)
Log market-cap	-0.031	-0.001	0.018	-0.025
	(0.03)	(0.02)	(0.03)	(0.02)
Log leverage	-0.128	0.049	0.405	0.002
	(0.35)	(0.25)	(0.28)	(0.30)
Returns	0.231***	0.153**	0.192***	0.195***
	(0.05)	(0.06)	(0.07)	(0.05)
Ultimate ownership	-0.455	-0.603***	-0.419	-0.163
	(0.44)	(0.20)	(0.35)	(0.21)
Control	-0.157	0.128	0.031	-0.001
	(0.12)	(0.08)	(0.12)	(0.07)
VR	0.427	-0.032	0.126	-0.084
	(0.40)	(0.17)	(0.31)	(0.17)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Observations	817	867	778	854
R-sq	0.5525	0.4259	0.5515	0.4126

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	Cash-to-Assets		*Debt-to-CF*	
	Low Constraint	High Constraint	Low Constraint	High Constraint
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Valuation decline not concentrated in firms with higher financial constraints, but more cash rich group firms

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Valuation Effects: Variation by Conflicts of Interest (T3C)

	Incentive Conflict			
	Low Conflict	High Conflict	Low Conflict	High Conflict
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.010	-0.146***	0.018	-0.208***
	(0.04)	(0.05)	(0.05)	(0.07)
ROA	0.584	1.903**	0.639	2.359*
	(0.50)	(0.96)	(0.64)	(1.23)
Log market-cap	0.013	-0.021	0.018	-0.017
	(0.02)	(0.03)	(0.02)	(0.03)
Log leverage	-0.069	0.081	-0.055	0.185
	(0.21)	(0.33)	(0.21)	(0.39)
Returns	0.105*	0.262***	0.104**	0.238***
	(0.06)	(0.06)	(0.05)	(0.07)
Ultimate ownership	2.428**	0.008	2.139**	0.065
	(0.97)	(0.43)	(0.89)	(0.48)
Control	-0.120	0.048	-0.190***	0.109
	(0.08)	(0.12)	(0.07)	(0.13)
VR	-2.194***	-0.140	-1.854***	-0.159
	(0.76)	(0.38)	(0.70)	(0.44)
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes
Observations	892	856	746	697
R-sq	0.5110	0.5358	0.6034	0.5269

nb. Columns 3 and 4 excludes firms with more than 5% change in treasury shares

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Valuation Effects: Variation by Conflicts of Interest (T3C)

	Incentive Conflict			
	Low Conflict	High Conflict	Low Conflict	High Conflict
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*	(4) *Forward Q*
Remove Loop	-0.010	-0.146***	0.018	-0.208***
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Valuation decline concentrated in firms in which family has greater conflicts of interest, suggesting the possibility of expropriation effects or transparency of incentives

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Control Effects of Changes in Cross-Shareholding (T4B)

	(1)	(2)	(3)	(4)	(5)	(6)
	Forward Control	*Forward Control*	*Forward Conflict*	*Forward Conflict*	*Forward Centrality*	*Forward Centrality*
Remove Loop	0.061	0.041	0.010	0.010	0.015	0.010
	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
ROA	0.045	0.055	0.183**	0.065*	-0.321***	-0.254***
	(0.25)	(0.11)	(0.09)	(0.04)	(0.11)	(0.08)
Log market-cap	-0.005	-0.004	-0.018***	-0.006***	0.018***	0.012**
	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Log leverage	0.159	0.031	0.086	0.031	-0.217***	-0.188***
	(0.22)	(0.07)	(0.08)	(0.03)	(0.07)	(0.06)
Returns	-0.010	-0.000	-0.004	-0.001	-0.001	-0.003
	(0.02)	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)
Ultimate ownership		0.191**		-0.799***		0.553***
		(0.08)		(0.04)		(0.08)
Control		0.753***		-0.005		-0.016
		(0.04)		(0.01)		(0.02)
VR		-0.080		0.746***		-0.123***
		(0.07)		(0.04)		(0.05)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,681	1,681	1,681	1,681	1,684	1,684
R-sq	0.5428	0.8005	0.3486	0.7607	0.1992	0.3688

Control Effects of Changes in Cross-Shareholding (T4B)

	(1)	(2)	(3)	(4)	(5)	(6)
	Forward Control	*Forward Control*	*Forward Conflict*	*Forward Conflict*	*Forward Centrality*	*Forward Centrality*
Remove Loop	0.061	0.041	0.010	0.010	0.015	0.010
	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
ROA	0.045	0.055	0.183**	0.065*	-0.321***	-0.254***
	(0.25)	(0.11)	(0.09)	(0.04)	(0.11)	(0.08)
Log market-cap	-0.005	-0.004	-0.018***	-0.006***	0.018***	0.012**
	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Log leverage	0.159	0.031	0.086	0.031	-0.217***	-0.188***
	(0.22)	(0.07)	(0.08)	(0.03)	(0.07)	(0.06)
Returns	-0.010	-0.000	-0.004	-0.001	-0.001	-0.003
	(0.02)	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)
Ultimate ownership		0.191**		-0.799***		0.553***
		(0.08)		(0.04)		(0.08)
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		(0.07)		(0.04)		(0.05)
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Group FE	Yes	Yes	Yes	Yes	Yes	Yes
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Addition of a firm to (removal from) loops associated with increase (no change) in family's control/incentives
Simplifying group structures had valuation implications despite no change in family's control/incentives

HBS

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	(1)	(2)	(3)	(4)	(5)	(6)
	Forward Control	*Forward Control*	*Forward Conflict*	*Forward Conflict*	*Forward Centrality*	*Forward Centrality*
Remove Loop	0.061	0.041	0.010	0.010	0.015	0.010
	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
ROA	0.045	0.055	0.183**	0.065*	-0.321***	-0.254***
	(0.25)	(0.11)	(0.09)	(0.04)	(0.11)	(0.08)
Log market-cap	-0.005	-0.004	-0.018***	-0.006***	0.018***	0.012**
	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Log leverage	0.159	0.031	0.086	0.031	-0.217***	-0.188***
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Returns	-0.010	-0.000	-0.004	-0.001	-0.001	-0.003
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		(0.08)		(0.04)		(0.08)
Control		0.753***		-0.005		-0.016
		(0.04)		(0.01)		(0.02)
VR		-0.080		0.746***		-0.123***
		(0.07)		(0.04)		(0.05)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,681	1,681	1,681	1,681	1,684	1,684
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	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
ROA	0.045	0.055	0.183**	0.065*	-0.321***	-0.254***
	(0.25)	(0.11)	(0.09)	(0.04)	(0.11)	(0.08)
Log market-cap	-0.005	-0.004	-0.018***	-0.006***	0.018***	0.012**
	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Log leverage	0.159	0.031	0.086	0.031	-0.217***	-0.188***
	(0.22)	(0.07)	(0.08)	(0.03)	(0.07)	(0.06)
Returns	-0.010	-0.000	-0.004	-0.001	-0.001	-0.003
	(0.02)	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)
Ultimate ownership		0.191**		-0.799***		0.553***
		(0.08)		(0.04)		(0.08)
Control		0.753***		-0.005		-0.016
		(0.04)		(0.01)		(0.02)
VR		-0.080		0.746***		-0.123***
		(0.07)		(0.04)		(0.05)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,681	1,681	1,681	1,681	1,684	1,684
R-sq	0.5428	0.8005	0.3486	0.7607	0.1992	0.3688

Addition of a firm to (removal from) loops associated with increase (no change) in family's control/incentives
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Expropriation Effects by Conflicts of Interest (T4C)

	Incentive Conflict					
	Low Conflict	High Conflict	Low Conflict	High Conflict	Low Conflict	High Conflict
	(1)	(2)	(3)	(4)	(5)	(6)
	Forward RPT to Assets	*Forward RPT to Assets*	*Forward RPT to Sales*	*Forward RPT to Sales*	*Forward ROA*	*Forward ROA*
Remove Loop	0.031	-0.044	0.032	-0.038	0.011	-0.006
	(0.04)	(0.04)	(0.04)	(0.03)	(0.01)	(0.01)
ROA	1.333***	0.022	0.523*	-0.105		
	(0.40)	(0.29)	(0.29)	(0.24)		
Log market-cap	-0.029*	-0.033	-0.001	-0.010	0.009***	0.011***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.00)	(0.00)
Log leverage	-0.652**	-0.585**	-0.412*	-0.270	-0.055*	-0.037
	(0.26)	(0.28)	(0.21)	(0.20)	(0.03)	(0.04)
Returns	-0.004	0.022	0.005	0.020	0.032***	0.030***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Ultimate ownership	-0.514	-0.256	-0.048	-0.173	0.170**	-0.039
	(0.74)	(0.20)	(0.55)	(0.17)	(0.08)	(0.05)
Control	0.054	0.051	0.005	-0.004	0.008	-0.014
	(0.09)	(0.07)	(0.07)	(0.05)	(0.01)	(0.01)
VR	-0.015	0.211	-0.156	0.224	-0.144**	0.027
	(0.51)	(0.22)	(0.38)	(0.17)	(0.06)	(0.03)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	674	620	674	620	892	857
R-sq	0.4879	0.2745	0.3346	0.2977	0.2348	0.3746

HBS

Expropriation Effects by Conflicts of Interest (T4C)

	Incentive Conflict					
	Low Conflict	High Conflict	Low Conflict	High Conflict	Low Conflict	High Conflict
	(1)	(2)	(3)	(4)	(5)	(6)
	Forward RPT to Assets	*Forward RPT to Assets*	*Forward RPT to Sales*	*Forward RPT to Sales*	*Forward ROA*	*Forward ROA*
Remove Loop	0.031	-0.044	0.032	-0.038	0.011	-0.006
	(0.04)	(0.04)	(0.04)	(0.03)	(0.01)	(0.01)
ROA	1.333***	0.022	0.523*	-0.105		
	(0.40)	(0.29)	(0.29)	(0.24)		
Log market-cap	-0.029*	-0.033	-0.001	-0.010	0.009***	0.011***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.00)	(0.00)
Log leverage	-0.652**	-0.585**	-0.412*	-0.270	-0.055*	-0.037
	(0.26)	(0.28)	(0.21)	(0.20)	(0.03)	(0.04)
Returns	-0.004	0.022	0.005	0.020	0.032***	0.030***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Ultimate ownership	-0.514	-0.256	-0.048	-0.173	0.170**	-0.039
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VR	-0.015	0.211	-0.156	0.224	-0.144**	0.027
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Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
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Also, loop removal not associated with more related party transactions (*RPT*) or lower *ROA* in firms where family has greater conflicts of interests

HBS

Expropriation Effects by Conflicts of Interest (T4C)

	Incentive Conflict					
	Low Conflict	High Conflict	Low Conflict	High Conflict	Low Conflict	High Conflict
	(1)	(2)	(3)	(4)	(5)	(6)
	Forward RPT to Assets	*Forward RPT to Assets*	*Forward RPT to Sales*	*Forward RPT to Sales*	*Forward ROA*	*Forward ROA*
Remove Loop	0.031	-0.044	0.032	-0.038	0.011	-0.006
	(0.04)	(0.04)	(0.04)	(0.03)	(0.01)	(0.01)
ROA	1.333***	0.022	0.523*	-0.105		
	(0.40)	(0.29)	(0.29)	(0.24)		
Log market-cap	-0.029*	-0.033	-0.001	-0.010	0.009***	0.011***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.00)	(0.00)
Log leverage	-0.652**	-0.585**	-0.412*	-0.270	-0.055*	-0.037
	(0.26)	(0.28)	(0.21)	(0.20)	(0.03)	(0.04)
Returns	-0.004	0.022	0.005	0.020	0.032***	0.030***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Ultimate ownership	-0.514	-0.256	-0.048	-0.173	0.170**	-0.039
	(0.74)	(0.20)	(0.55)	(0.17)	(0.08)	(0.05)
Control	0.054	0.051	0.005	-0.004	0.008	-0.014
	(0.09)	(0.07)	(0.07)	(0.05)	(0.01)	(0.01)
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Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
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R-sq	0.4879	0.2745	0.3346	0.2977	0.2348	0.3746

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Expropriation Effects by Conflicts of Interest (T4C)

	Incentive Conflict					
	Low Conflict	High Conflict	Low Conflict	High Conflict	Low Conflict	High Conflict
	(1)	(2)	(3)	(4)	(5)	(6)
	Forward RPT to Assets	*Forward RPT to Assets*	*Forward RPT to Sales*	*Forward RPT to Sales*	*Forward ROA*	*Forward ROA*
Remove Loop	0.031	-0.044	0.032	-0.038	0.011	-0.006
	(0.04)	(0.04)	(0.04)	(0.03)	(0.01)	(0.01)
ROA	1.333***	0.022	0.523*	-0.105		
	(0.40)	(0.29)	(0.29)	(0.24)		
Log market-cap	-0.029*	-0.033	-0.001	-0.010	0.009***	0.011***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.00)	(0.00)
Log leverage	-0.652**	-0.585**	-0.412*	-0.270	-0.055*	-0.037
	(0.26)	(0.28)	(0.21)	(0.20)	(0.03)	(0.04)
Returns	-0.004	0.022	0.005	0.020	0.032***	0.030***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
Ultimate ownership	-0.514	-0.256	-0.048	-0.173	0.170**	-0.039
	(0.74)	(0.20)	(0.55)	(0.17)	(0.08)	(0.05)
Control	0.054	0.051	0.005	-0.004	0.008	-0.014
	(0.09)	(0.07)	(0.07)	(0.05)	(0.01)	(0.01)
VR	-0.015	0.211	-0.156	0.224	-0.144**	0.027
	(0.51)	(0.22)	(0.38)	(0.17)	(0.06)	(0.03)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	674	620	674	620	892	857
R-sq	0.4879	0.2745	0.3346	0.2977	0.2348	0.3746

Also, loop removal not associated with more related party transactions (*RPT*) or lower *ROA* in firms where family has greater conflicts of interests

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Deloop Valuation FX: IPW and Loop Dependence (T10A)

	Sample		
	All	All	Loop Firms
	(1) *Forward Q*	(2) *Forward Q*	(3) *Forward Q*
Remove Loop	-0.101***		
	(0.03)		
Loop Dependency		-0.030***	-0.027**
		(0.01)	(0.01)
Industry FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Group FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	1,751	1,675	356
R-sq	0.5009	0.4606	0.3855

Deloop Valuation FX: Stand-Alone Q (T10B)

	Sample		
	All	Low Separation	High Separation
	(1)	(2)	(3)
Remove Loop	-0.121***	-0.039	-0.151**
	(0.05)	(0.06)	(0.06)
Observations	1,710	866	841
R-sq	0.4100	0.4807	0.5106

Spillover Valuation FX: Stand-Alone Q (T10C)

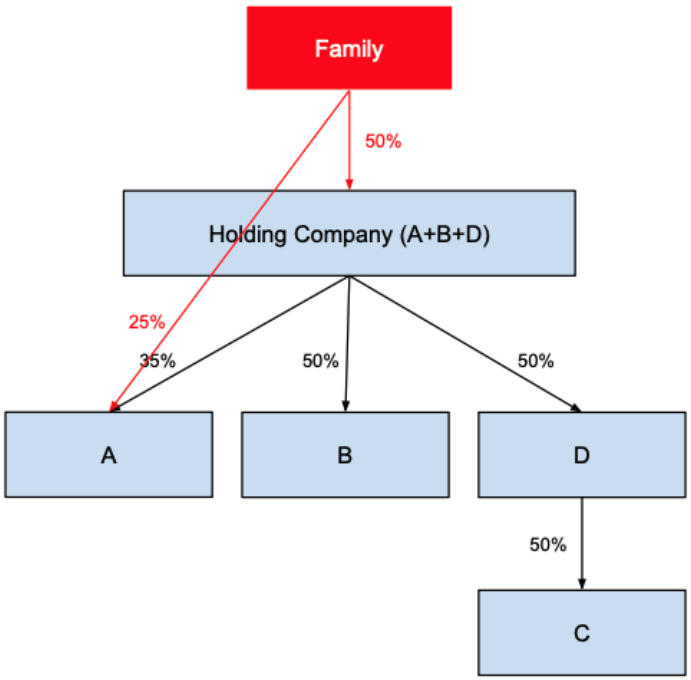
	Sample			
	Low Separation		High Separation	
	Lower in Group	Low Direct Own	Lower in Group	Low Direct Own
	(1)	(2)	(3)	(4)
Removal Fraction	1.778*	1.747**	-1.064+	-1.061+
	(0.89)	(0.86)	(0.69)	(0.68)
Observations	170	226	305	417
R-sq	0.6048	0.5819	0.4745	0.6010

Control Changes for Non-Loop Firms (T9D)

	(1)	(2)	(3)	(4)	(5)	(6)
	Forward Control	*Forward Control*	*Forward Conflict*	*Forward Conflict*	*Forward Centrality*	*Forward Centrality*
Removal Fraction	-0.029	0.007	-0.016	0.002	0.033	0.052
	(0.16)	(0.08)	(0.07)	(0.03)	(0.05)	(0.05)
ROA	0.070	0.041	0.156	0.044	-0.189	-0.135
	(0.28)	(0.12)	(0.10)	(0.05)	(0.12)	(0.09)
Log market-cap	-0.014	-0.005	-0.019***	-0.006***	0.016**	0.011*
	(0.02)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
Log leverage	0.195	0.004	0.050	0.015	-0.144**	-0.132**
	(0.21)	(0.07)	(0.09)	(0.03)	(0.07)	(0.06)
Returns	0.001	-0.001	-0.001	0.002	-0.001	-0.006
	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Ultimate ownership		0.202**		-0.804***		0.543***
		(0.09)		(0.04)		(0.09)
Control		0.744***		-0.007		0.001
		(0.04)		(0.01)		(0.02)
VR		-0.123		0.720***		-0.135***
		(0.08)		(0.04)		(0.05)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,317	1,317	1,317	1,317	1,319	1,319
R-sq	0.5480	0.7929	0.3732	0.7670	0.2118	0.4041

Stylized Example of Holding Company Structure

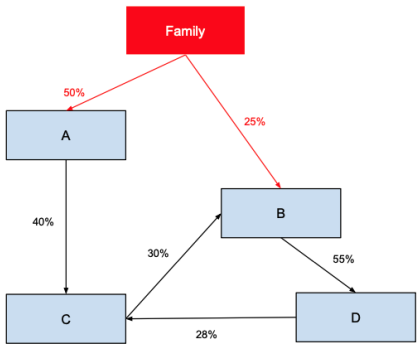
4. Holding Company buys shares from Family; Family buys Holding Company shares



After	Voting	Cash_Flow	Wedge
A	60.0%	42.5%	17.5%
B	50.0%	25.0%	25.0%
C	50.0%	12.5%	37.5%
D	50.0%	25.0%	25.0%

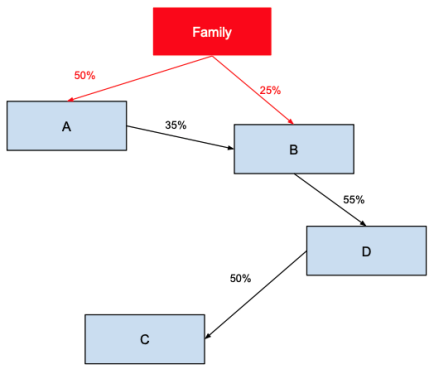
Stylized Example of Holding Company Structure

1. Cross-Shareholding

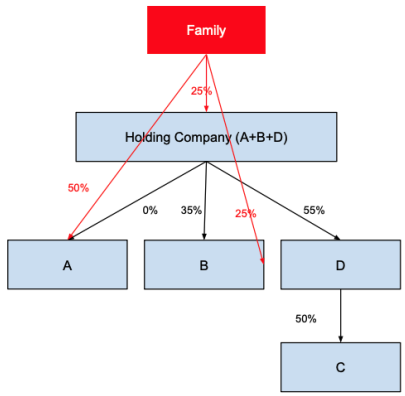


Before	Voting	Cash_Flow	Wedge
A	50.0%	50.0%	0.0%
B	55.0%	32.5%	22.5%
C	68.0%	25.0%	43.0%
D	55.0%	17.9%	37.1%

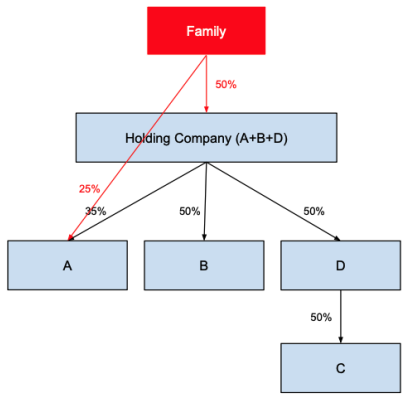
2. A and C swap shares.
Now A owns B.
C Retires Shares.



3. ABD Merge and Divide
Assuming A:B:D = 1:1:1



4. Holding Company buys shares from Family; Family buys Holding Company shares



After	Voting	Cash_Flow	Wedge
A	60.0%	42.5%	17.5%
B	50.0%	25.0%	25.0%
C	50.0%	12.5%	37.5%
D	50.0%	25.0%	25.0%

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How Common Are Reciprocal/Circular Shareholdings?

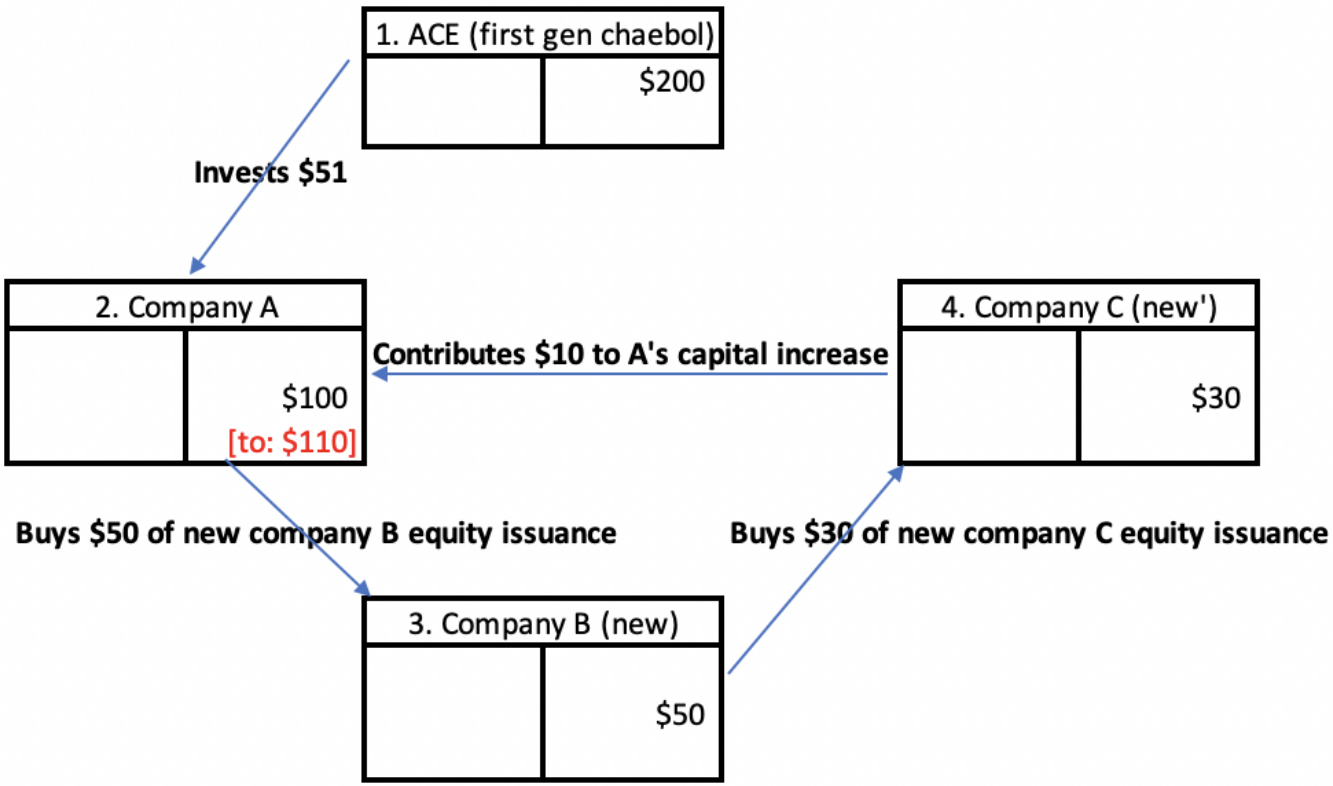
- Masulis et al (2011) estimates that 10% of business group firms around the world employ reciprocal ownership structures
- Claessens et al (2000) obtains a similar estimate by analyzing business groups in East Asian countries
- Because circular shareholding structures can result from more general and complex structures than reciprocal ownership, they are likely to encompass more business group firms than the 10% estimate

  e.g., At the beginning of our study, nearly 30% of listed Korean business-group firms were parts of circular ownership loops, but only 2% of listed group firms were in reciprocal ownership arrangements

Importance of Circular Corporate Contributions

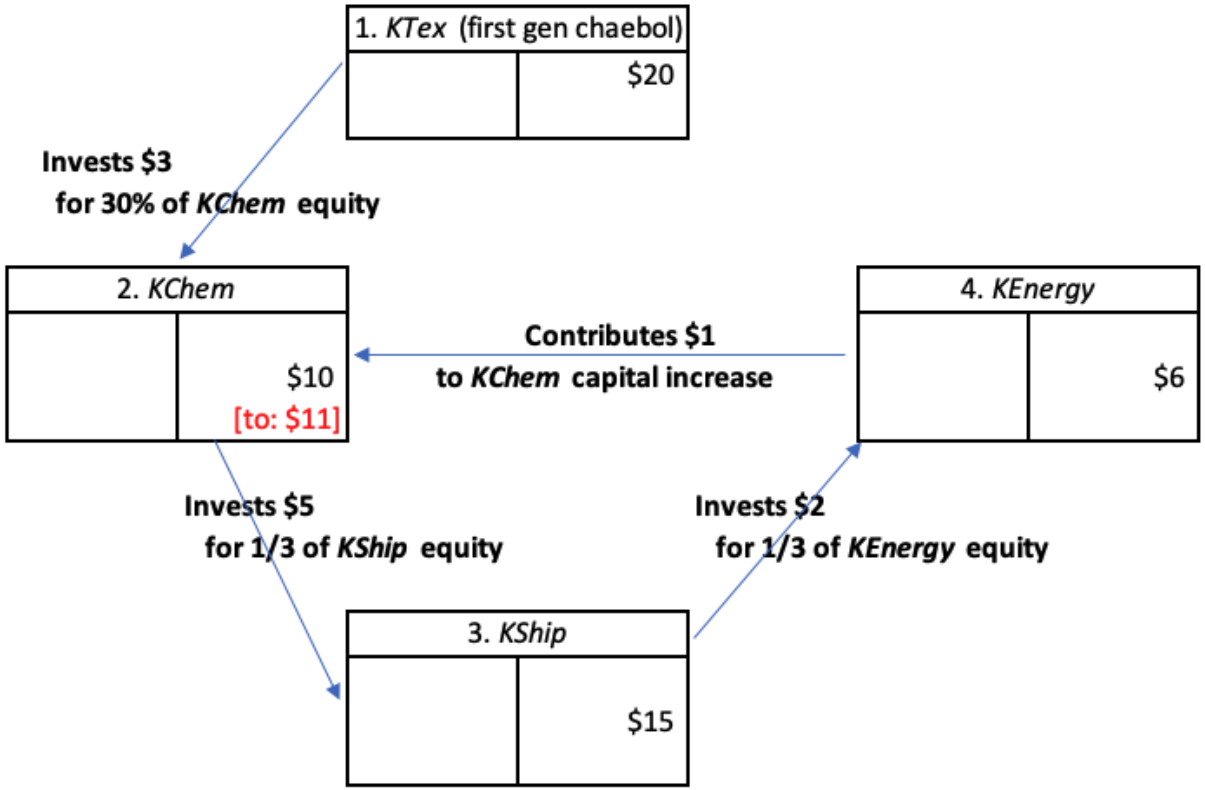
- To allow Korean companies to grow and compete against established foreign enterprises, the government instituted import barriers and **laws that allowed circular corporate contributions**
  - ↪ Circular contributions critical to achieving chaebols' growth and conglomeration
- Circular contributions critical to achieving chaebols' growth and conglomeration
  - ↪ Founding families can achieve control with a lower degree of direct ownership
  - ↪ Loops create "phantom" capital that the family effectively controls, enhancing its overall control over a firm
  - ↪ Until 1999, South Korean government also allowed mutual contributions (loops involving two firms) which makes these control enhancing transactions more effective / efficient
  - ↪ In 2017 the Chaebol families of the 10 largest conglomerates in South Korea owned only **2.5%** of conglomerate shares, on average. However, they exercised control over **58.3%** of shares.

Example: Circular Contributions ("Loops")



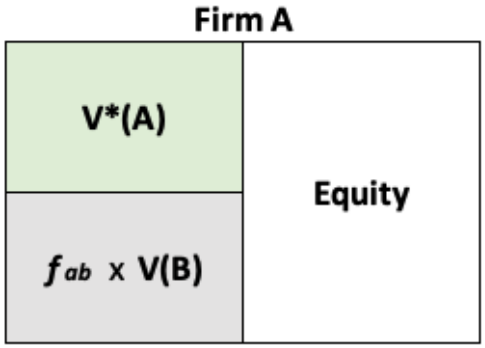
- A's capital increased by \$10 without any real contribution (A→B→C→A)
  - ↪ Total capital appears to be \$190 even though only \$100 of real capital (sum of external contributions)
  - ↪ Bankruptcy in one company can have a domino effect!
- Ace now controls A, B, and C, and its control of A: 51% → **55%**!

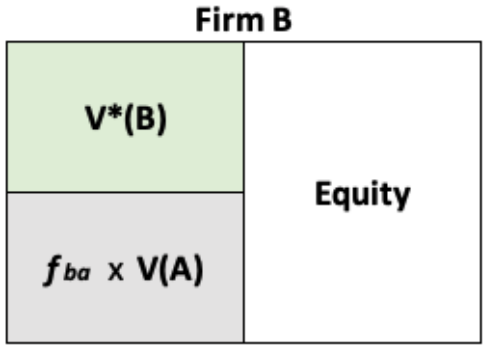
Example 2: Circular Contributions ("Loops")



- *KChem*'s capital increased by \$1 without any real contribution (2→3→4→2)
  - ↪ Total capital appears to be \$32 even though only \$24 of real capital
  - ↪ Bankruptcy in one company can have a domino effect!
- *KTex* now controls 2, 3, and 4, and its control of 2: 30% → **36%**!

Valuing Cross-Shareholding Firms: 2 Firm Example





V*(i): Value of productive assets in Firm A
V(i): Value of total assets in Firm i

f_{ab}: % of Firm B shares owned by firm A
f_{ba}: % of Firm A shares owned by firm B

1. Market capitalization of individual firms ($V(A)$ and $V(B)$) overstates the value of productive assets in the economy by the amount of cross-shareholdings
2. It is difficult to figure out the total or productive-asset value of firms individually, as they are simultaneously determined

$$V(A) = V^*(A) + f_{ab}\underbrace{[V^*(B) + f_{ba}V(A)]}_{V(B)}$$

$$V(B) = V^*(B) + f_{ba}\underbrace{[V^*(A) + f_{ba}V(B)]}_{V(A)}$$

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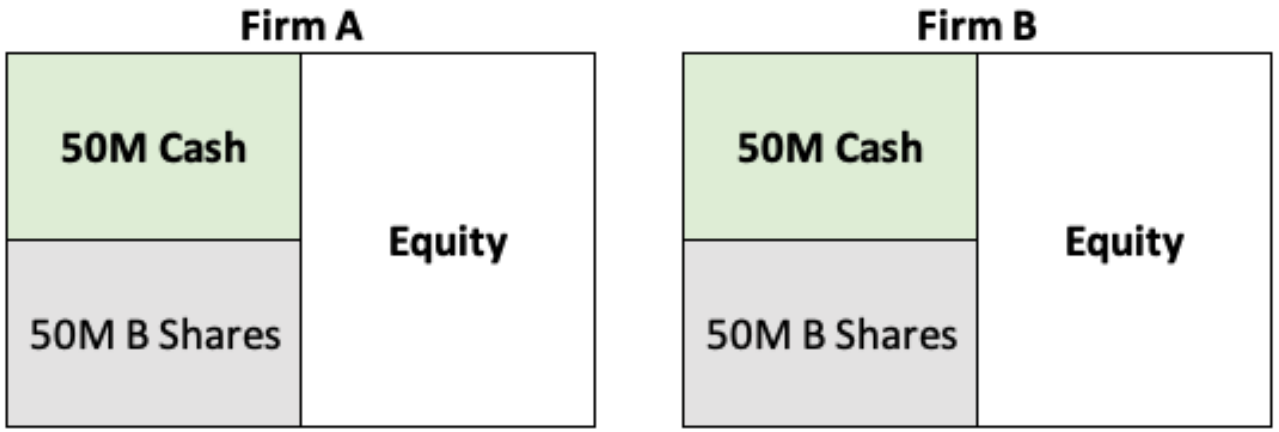
Valuing Cross-Shareholding Firms: 2 Firm Example



Shares Outstanding = 100M
(50M shares held externally)

Shares Outstanding = 100M
(50M shares held externally)

$$\begin{aligned} V(A) &= 50 + 0.5[50 + 0.5V(A)] \\ V(B) &= 50 + 0.5[50 + 0.5V(B)] \end{aligned}$$

1. Total (External Holdings) market capitalization of each firm is $V(A) = V(B) = 100M$ ($\$50M$)
2. Price per share for each firm is $P_A = P_B = \$1$

Valuing Cross-Shareholding Firms: General Case

In a two-firm example it's simple enough to solve by hand. Generally, requires a system of equations.

$$\underbrace{\begin{bmatrix} V(A) \\ V(B) \end{bmatrix}}_{V} = \underbrace{\begin{bmatrix} V^*(A) \\ V^*(B) \end{bmatrix}}_{D_p} + \underbrace{\begin{bmatrix} 0 & f_{ab} \\ f_{ba} & 0 \end{bmatrix}}_{C} \underbrace{\begin{bmatrix} V(A) \\ V(B) \end{bmatrix}}_{V}$$

Thus, we can relate total value of firms to the value of productive asset through the cross-holdings matrix as follows

$$V = (I - C)^{-1} D_p$$

nb1 Market values V inflate value of productive assets (where $(I - C)^{-1}$ provides the inflation factor, particularly due to role of loops)

nb2 The market value of external holdings (V) across the group equals the market value of the productive assets

- ↪ Intuition is that the inflation comes from values of firms' holdings in each others shares, so value of external holdings gives the non-inflated stuff
- ↪ In two-firm example, $\hat{C} = I - C$ (since external holdings in B is $1 - f_{ab}$ and external holdings in A is $1 - f_{ba}$), thus

$$\hat{C} V = D_p$$

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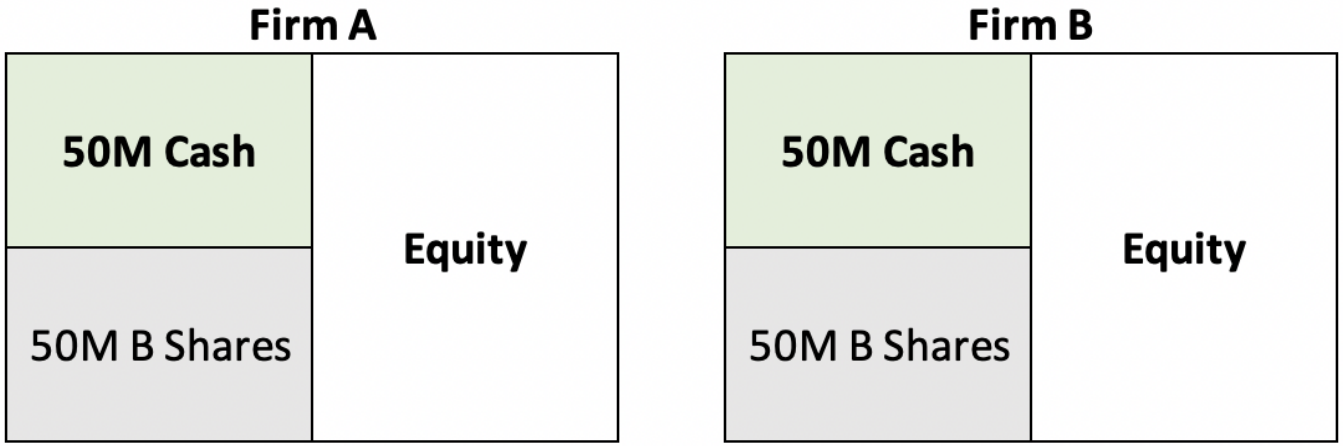
Undoing Loops and Price per Share

- All else equal, un-looping *per se* should have no effects on stock returns (price per share changes) if the equity transactions involved occurred at fair values
- However, there could be value transfers that increase/decrease price per share if equity transactions involved occurred at unfair values
- In our tests, we address the potential mechanical effects of un-looping in two ways
  - ↪ We check to see see if value effects are driven by group firms with significant changes in treasury shares (capturing the likelihood that equity transactions could significantly drive value transfers)
  - ↪ We check to see see if results are robust when looking at stand alone values of Q (using stand alone market cap and stand alone book values)

Undoing Loops and Price per Share: Case 1



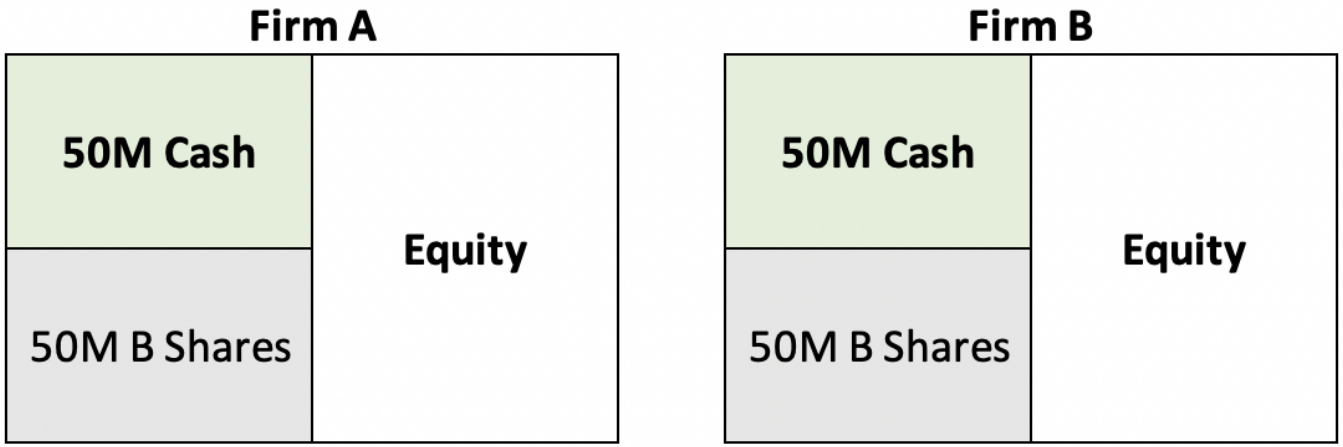
Shares Outstanding = 100M
(50M shares held externally)
P_A=\$1 / Share (Solveable)
$MCAP_A$=\$100M

Shares Outstanding = 100M
(50M shares held externally)
P_B=\$1 / Share (Solveable)
$MCAP_B$=\$100M

- Firm B sells \$50M shares of A stock on market at \$1 / share (fair value)

Firm B. 100M in cash, 100M shares, P_B remains \$1/*sh*
Firm A. 50M in cash, 50M in B shares, 100M shares (all public owned), P_A remains \$1/*sh*

Undoing Loops and Price per Share: Case 1 (Cont'd)



Shares Outstanding = 100M
(50M shares held externally)
P_A=\$1 / Share (Solveable)
$MCAP_A$=\$100M

Shares Outstanding = 100M
(50M shares held externally)
P_B=\$1 / Share (Solveable)
$MCAP_B$=\$100M

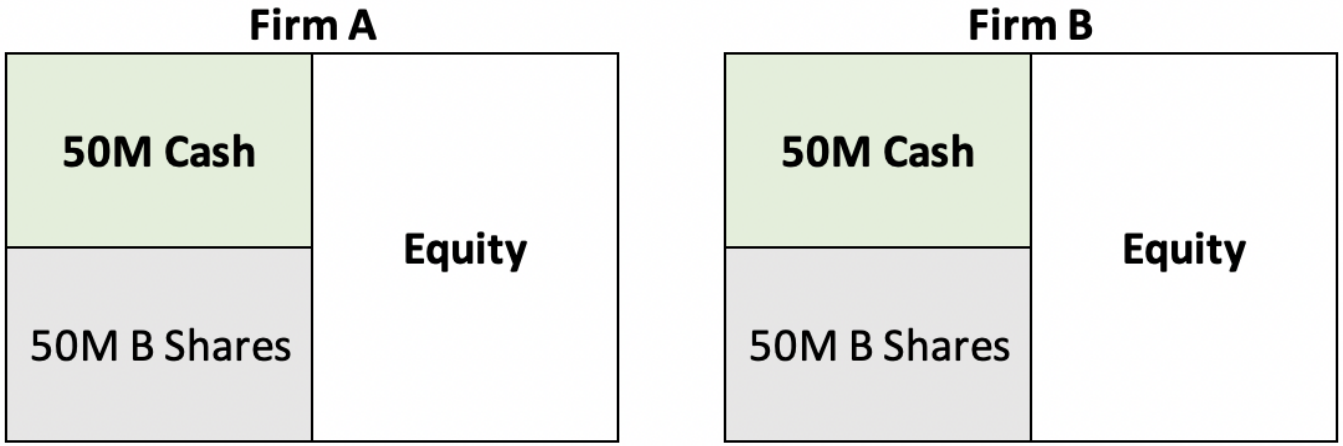
1. Firm B subsequently buys back shares half of its shares at $\$1/sh$

Firm B 50M in cash, 50M shares, P_B remains $\$1/sh$
Firm A Unaffected. P_A remains $\$1/sh$

2. Firm B subsequently buys back A's shares in B at $\$1/sh$

Firm B 50M in cash, 50M shares (all public owned), P_B remains $\$1/sh$
Firm A 100M in cash, 100M shares (all public owned), P_A remains $\$1/sh$

Undoing Loops and Price per Share: Case 2



Shares Outstanding = 100M
(50M shares held externally)
P_A=\$1 / Share (Solveable)
$MCAP_A$=\$100M

Shares Outstanding = 100M
(50M shares held externally)
P_B=\$1 / Share (Solveable)
$MCAP_B$=\$100M

- Firm A and B swap shares at "fair value" then put them back in treasury
  - ↪ This is equivalent to B selling shares in A at fair value then buying back 50% of its shares, and A selling shares in B at fair value then buying back 50% of its shares (Case 1)
  - ↪ Based on analysis of Case 1, $P_A = P_B = \$1$

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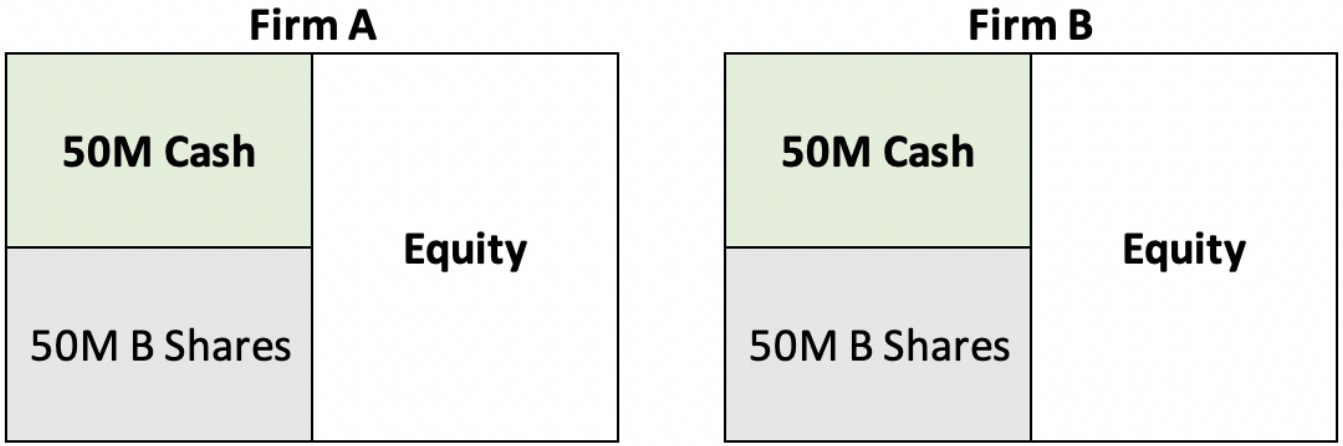
Undoing Loops and Price per Share: Case 3



Shares Outstanding = 100M
(50M shares held externally)
P_A=\$1 / Share (Solveable)
$MCAP_A$=\$100M

Shares Outstanding = 100M
(50M shares held externally)
P_B=\$1 / Share (Solveable)
$MCAP_B$=\$100M

- Firm A and B swap shares at unfair values (e.g., B swaps 50M shares of A 25M shares of B) and put them back in treasury

Firm B 50M in cash, 75M shares (50M public), P_B reduces to $\$0.67/sh$
Firm A 50M in cash, 25M shares in B, 50M shares (all public), P_A increases to $(\$50M + 25 \times 0.67)/50M = \$1.33/sh$

Corporate Governance in Korea

- South Korean CG challenges often framed as protecting minority shareholder interests from the conduct of the founding family (the "chaebols")

- Post-war government led industrial growth ("guided capitalism") in which...
  - ↪ controlled allocation of financial resources and channeled them to selected export-oriented industries
  - ↪ President and General Park's coup resulted in nationalization of all South Korean banks
  - ↪ Companies that conformed to Park's economic agenda received credit and on favorable terms
  - ↪ Almost all Korean conglomerates began during this period in one of these export-oriented industries, under government sponsorship

- To allow Korean companies to grow and compete against established foreign enterprises, the government instituted import barriers and **laws that allowed circular corporate contributions**
  - ↪ Circular contributions critical to achieving chaebols' growth and conglomeration

Holding Company Structure in Korea

- In 1986, *Monopoly Regulation and Fair Trade Act* ("Fair Trade Act" or "FTA") was amended to prohibit the establishment of holding companies
  - ↪ Growing concern that such structure could facilitate/accelerate concentration of economic power
  - ↪ Some scholars argue that the Japanese Antimonopoly Act's prohibition on holding companies served as a model for this change, as four conglomerates dominated Japan's economy and South Korea seemed to move towards this structure

- After Asian Financial Crisis of 1997, South Korean law gradually continuously promoted the establishment of holding company structures
  - ↪ Many chaebols faced the need for divestiture through M&A and restructuring
  - ↪ In 1999, FTA was amended to allow holding company structures
  - ↪ In 2007, relevant requirements were significantly relaxed:
    - debt-to-equity ratio ceiling for the holding company was raised from 100% to 200%,
    - subsidiary company shares holding requirement lowered from 30% and 50% to 20% and 40% for public and private subsidiaries

Explicit and Implicit Incentives to Transition

- Regulators amended the tax code to provide holding companies tax relief on their dividend income
  - ↪ A holding company's dividend income from subsidiaries is fully tax-exempt provided that it holds a significant portion of the subsidiary's shares (40% ownership of public or 80% of private subsidiary shares)
  - ↪ Holding companies that do not meet these statutory ownership thresholds receive an 80% tax exemption

- Explicit or threat of regulation
  - ↪ New cross-shareholdings were outlawed under Park Geun Hye (circa 2013-2014)
  - ↪ Under Presidents Park (2013-2017) and Moon (2017-), there was a focus on governing chaebols (e.g., Park's "economic democratization" plan), and thus an implicit threat of regulation / penalties if transitions were not completed.
    - ⋆ This could be why we saw a big drop-off in loops between 2013-18

- Transitions (and the intragroup mergers) a way to facilitate succession without inheritance tax while preserving control
  - ↪ Korea has one of the highest inheritance/succession taxes (50%); giving shares to son would trigger such taxes, which might require him to liquidate shares / dilute holdings

Samsung C&T and Cheil Industries: Succession Planning

Intragroup mergers allow for son's direct stake in one group company to be converted into (enhanced) stakes in another (Shin, 2020)

- Samsung CT/Cheil's merger

  ↪ Instead of taking over dad's shares in the group's crown jewel Samsung Electronics (which would have triggered a huge tax bill), Cheil (in which the son is the largest shareholder at 24%) merged with CT at a good price for Cheil

  - ⋆ Cheil's share price was around its highest since its IPO; C&T was near a five-year low.
  - ⋆ Because merger ratios are (by law) transacted based on market set in a period prior to the announcement (based on average stock prices over the previous month), this effectively gives Cheil all the operating assets of CT "for free" once you account for their common stakes in other group companies

  ↪ The transaction allowed the son to consolidate its control over firms that both CT and Cheil had shares in, including Samsung Electronics and Samsung Life, without officially taking over dad's shares

  ↪ Elliot management boosted its stake in C&T when merger was announced (which had to go through shareholder vote) and pushed for shareholders to negotiate a better deal. Ultimately failed.

Legal Requirements of Holding Company Structure

- Holding Company
  - ↪ Own KRW 500 billion assets, of which at least 50% must be subsidiary shares
  - ↪ Hold at least 20% of shares of public subsidiary and at least 40% of shares of private subsidiary
  - ↪ Can't hold shares of affiliated companies other than subsidiaries (i.e. can't hold shares of subsidiaries of subsidiaries)
  - ↪ Can't hold over 5% of shares of non-affiliated companies
  - ↪ Can't have both financial and non-financial subsidiaries
  - ↪ Debt-to-equity ratio below 200%
  - *nb* Any company meeting the above requirements automatically is deemed a holding company (does not have right to opt out)

- Subsidiary
  - ↪ Subsidiary can only hold shares of sub-subsidiary, sub-subsidiary can only hold shares of sub-sub-subsidiary, and so on
  - ↪ Subsidiary must hold at least 20% of shares of public sub-subsidiary and at least 40% of private sub-subsidiary
  - ↪ Sub-subsidiary must hold 100% of sub-sub-subsidiary
  - ↪ Mutual contributions are prohibited

Limits to Arbitrage?

- The market is more retail-driven (foreign institutional ownership on average 6.8% in our sample)
- Constraints to short selling: naked shorts are banned, short selling quite expensive (7x the transaction cost as regular transactions according to one estimate) (Lee, Wang, and Woo, 2014)
- Capital controls (e.g., since 2010) limit foreign investor participation (and the influx of smart money from abroad)
- An investor would have to...
  i. access the cross-shareholdings and family direct ownership data (all in Korean)
  ii. manually match them to each other to create cross holding matrices
  iii. then implement algorithms / solve simultaneous equations to back out estimates of effective ownership and control rights
  iv. Then, would have to figure out where markets may have gotten their expectations wrong by performing valuation across all group firms (e.g., hand match each firm to ticker, stock price etc...)

Not only is this computationally difficult, note that the algorithm for control wasn't even established until 2011 (Almaida et al, 2011)

Baseline Data from KFTC

$$C = \begin{bmatrix} 0 & c_{12} & \dots & c_{1N} \\ c_{21} & 0 & \dots & s_{2N} \\ . & . & . & . \\ . & . & . & . \\ c_{N1} & c_{N2} & \dots & 0 \end{bmatrix}, f = \begin{bmatrix} f_1 & f_2 & \dots & f_N \end{bmatrix}', d_i = \begin{bmatrix} 0 & 0 & .. & 1 & .. & 0 \end{bmatrix}',$$

C: Matrix of inter-corporate ownership

- $\hookrightarrow$ c_{ij}=percent ownership of group firm j owned by group firm j
- $\hookrightarrow$ N = represents the total number of firms in the group.

f: Controlling family's direct stake in each group firm

d_i: A unit vector where the i^{th} vector is 1, 0 otherwise

nb. KFTC collects C and f from each chaebol annually and makes the information publicly available

Cash-Flow Rights (Ultimate Ownership)

$$u = f'(I_N - C)^{-1}$$

$u_{N\times 1}$: $\begin{bmatrix} u_1 & u_2 & \dots & u_N \end{bmatrix}'$, where u_i represents the family's ultimate percentage of ownership of the cash flows of group firm i

- $\hookrightarrow$ I_N is the $N \times N$ identity matrix
- $\hookrightarrow$ $f_{N\times 1}$ is the controlling family's direct stake in each group firm

nb. Recall, the total value of group firm is obtained by

$$V = [I - C]^{-1} D_p \text{ for } D_p \text{ value of operating assets.}$$

Thus, for a dollar of dividends from firm i (d_i), $[I - C]^{-1} d_i$ is owned by each firm in the group, and $u_i = f'[I - C]^{-1} d_i$ is owned by the family.

Control

For a given voting threshold, T, the set of firms in the family's control is given by

$$C(T) = \left\{ i \in N : f_i + \sum_{j \in C(T), j \neq i} c_{ji} \geq T \right\}$$

where c_{ji} is % of i's shares owned by firm j

1. We assume a threshold of $T = 30\%$ of votes for control
   - ↪ By Enforcement Decree Articles 3-1 and 3-2 of the Fair Trade Act, a group firm where family has 30% effective ownership is deemed to be under the family's control
   - ↪ Several other jurisdictions around the world, such as China, Hong Kong, and the UK, use the same 30% threshold to determine control for statutory purposes; Singapore applies a 15% threshold.
2. Compute the set of group firms under the family's control every yea
3. **Intuition**: The family controls i if its direct stake plus the combined stake of all other "controlled" firms in i exceeds $T = 30\%$
   (i.e., assumes that the family gets to decide all votes for firms it controls)
3. **Computation**: By process of elimination. First, assume all firms under control and then check if the voting rights in a firm crosses the threshold, if not, drop them from the set and check for the remaining. Repeat until all assumptions check out.

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Voting Rights and Separation

- **Voting rights**: Given the control set, voting rights can be computed as

$$v_i = f_i + \sum_{j \in C(T), j \neq i} c_{ji}$$

  - ↪ **Intuition**: Family's direct ownership + ownership by all other group firms controlled by the family
  - ↪ Assumes that the family gets to decide all votes for firms it controls

- **Separation of ownership and control**: The difference between the family's voting rights and its ultimate cash-flow rights in a firm, i

$$sep_i = v_i - u_i$$

Loop and Centrality

- **Loop**: Firm is in a loop if $loop_i > 0$

$$loop_i = min[n : n \geq 1 \text{ and } d_i' C^n d_i > 0]$$

  - ↪ Those firms whose dividends return after a finite number of payment cycles (i.e., when firm i in a loop pays out a dollar in dividends, a portion of that dollar flows to firm i)
  - *nb.* We check up to $n = 20$

- **Centrality**: A firm's importance in establishing control; computed as sum of i's stake in equity of all other group firms scaled by i's assets

$$Centrality_i = \frac{\sum_j s_{ij} E_j}{A_i}$$

  - *nb* This is what Almeida et al (2011) call "stake," and alternative (and simpler) metric capturing centrality

Position

Position: The position of a firm within a group structure is the "distance" from the controlling family's ownership, computed as

$$position_i = \frac{f' d_i}{u_i} \times 1 + \frac{f' C d_i}{u_i} \times 2 + \frac{f' C^2 d_i}{u_i} \times ... = \sum_{n=1}^{\infty} \frac{f' C^{n-1} d_i}{u_i} \times n = \frac{1}{u_i} f' (I_N - C)^{-2} d_i$$

Intuition:

- Weights the distance between a firm and the family on a given ownership chain by the proportion of total cash flows that the family receives from that firm via that chain
- \$1 dividend is distributed to the family as...
  - ↪ first round $= f' d_i$
  - ↪ second round $= f' C d_i$
  - ↪ third round $= f' C^2 d_i$...
- **The larger the proportion of ownership established through multiple layers, the "deeper" the firm is in the group**

nb. $S = 1.I + 2.C + 3.C^2 + 4.C^3$
$CS = 1.C + 2.C^2 + 3.C^3$
$S(I - C) = I - C \implies S = (I - C)^{-2}$

Prior Literature

- A vast literature studies various attributes of business groups
  - ↪ Description of business groups worldwide
    (La Porta, Lopez-De-Silanes, and Shleifer, 1999;Faccio and Lang, 2002)
  - ↪ Performance outcomes
    (Khanna and Palepu, 2000a,b; Khanna and Rivkin, 2001; Bertrand, Mehta, and Mullainathan, 2002; Baek, Kang, and Park, 2004; Joh, 2003)
  - ↪ Institutional voids and role of internal capital markets in business groups
    (Gopalan, Nanda, and Seru,2006; Khanna and Palepu, 2000a,b; Stein, 1997)

- Relatively little work comparing implications of different control-enhancing structures or the evolution from one structure to another
  - ↪ Pyramids and circular holdings facilitate control with little ownership
  - ↪ Circular holdings make true ownership / locus of control less transparent
    (Bebchuk, Kraakman, and Triantis, 2000)

Related Literature

- Theoretical description of control-enhancing structures (e.g., Bebchuk et al., 2000)
- Description of business groups worldwide

  e.g., *La Porta, Lopez-De-Silanes, and Shleifer (1999)*;*Faccio and Lang (2002)*;*Claessens, Djankob, Fan, and Lang, (2002)*
- Performance outcomes of control and ownership in business groups – expropriation, propping, and internal capital markets

  e.g., *Bertrand, Mehta, and Mullainathan (2002)*; *Baek, Kang, and Park (2004)*; *Baek, Kang, and Kim (2002)*; *Gopalan, Nanda, and Seru (2006)*; *Joh (2003)*; *Khanna and Palepu (2000a,b)*; *Khanna and Rivkin (2001)*
- Determinants of and evolution of the structure of business groups

  e.g., *Almeida and Wolfenzon (2006)*; *Almeida, Park, Subrahmanyam, and Wolfenzon (2011)*

nb. We build on Almeida et al.,2011 by studying the outcomes of the transition in structure of business groups

Stein (QJE 1989): Earnings Structure

- "Natural" earnings $[e_t^*]$ consists of a random-walk permanent component $[z_t]$ and a white-noise transitory component $[v_t]$:

$$\begin{aligned} e_t^* &= z_t + v_t && (1) \\ z_t &= z_{t-1} + u_t && (2) \\ (u_t, v_t) &\underset{iid}{\sim} N(0, \Sigma \text{ psd}) \end{aligned}$$

- $\kappa = \frac{\sigma_u^2}{\sigma_v^2}$ "uncertainty": Lower $\kappa \implies$ more transitory noise in earnings.

- Managers manipulate earnings $[b_t]$ at the expense $[c(b_t)]$ of next period earnings. Manager reports:

$$e_t = \underbrace{e_t^* - c(b_{t-1})}_{\text{True earnings}} + b_t, \quad (3)$$

where $c(\cdot)$ convex and $c'(0) = 1 + r$.

Stein (QJE 1989): Prices and Managerial Incentives

- Linking reported earnings to prices. Reported earnings are assumed to be paid out as dividends, so that prices determined as:

$$P_t = \sum_{k=1}^{\infty} \frac{\mathbb{E}_t\left[e_{t+k}\right]}{(1+r)^k} = \sum_{k=1}^{\infty} \frac{\mathbb{E}_t\left[e^*_{t+k} + b_{t+k} - c(b_{t+k-1})\right]}{(1+r)^k}. \tag{4}$$

- Manager has both short-run (e.g., current prices) and long-run (e.g., future earnings) incentives. She is assumed to enter each period owning shares of her company's stock, and after that period's dividend payout will sell a fraction π of her equity holdings, retaining the remainder indefinitely.

$$\max_{e_t} \underbrace{e_t + \pi P_t}_{SR} + \underbrace{(1-\pi)\frac{\mathbb{E}_t[e_{t+1}]}{1+r}}_{LR} \tag{5}$$

π determines (exogenously) extent to which manager cares about SR.

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Stein (QJE 1989): Equilibrium

- Steady-state equilibrium where market correctly anticipate the manipulation ($\bar{b}$), and infers natural earnings from reported earnings.

$$\hat{e}_t^* = e_t - c(\bar{b}) + \bar{b} \tag{6}$$

- Market forms expectation of future earnings using a weighted average of past imputed true earnings (e.g., Holmstrom 1999):

$$\mathbb{E}_t[e_{t+k}^*] = \sum_{j=0}^{\infty} a_j \hat{e}_{t-j}^* \ \forall k. \tag{7}$$

- Prices determined as capitalized weighted average of past reported earnings:

$$P_t = \frac{1}{r}\left(\sum_{j=0}^{\infty} a_j e_{t-j}\right) \tag{10}$$

where $a_0 = (\kappa^2/4 + \kappa)^{1/2} - \kappa/2$, and $\kappa = \sigma_u^2/\sigma_v^2$, are "uncertainty" parameters that determine the extent to which current earnings are persistent and value relevant.

Stein (QJE 1989): Comparative Statics

Manager's Problem: $\max_{b_t} e_t + \pi P_t + (1-\pi)\frac{\mathbb{E}_t[e_{t+1}]}{1+r}$ with $P_t = \frac{1}{r}\sum_{j=0}^{\infty} a_j e_{t-j}$

Facing equilibrium pricing equation, manager chooses an optimal level of manipulation (b^*) that trades off between her short-run and long-run incentives:

$$[FOC]: \frac{\partial e_t}{\partial b_t} + \frac{\partial P_t}{\partial b_t} = -\frac{1-\pi}{1+r}\frac{\partial e_{t+1}}{\partial b_t}, \tag{12}$$

$$1 + \pi\frac{a_0}{r} = \frac{1-\pi}{1+r}c'(b^*). \tag{13}$$

- Mgr choose b^* to balance SR benefits and LT costs of manipulation
- Manage earnings upwards more (less) when there is less (greater) uncertainty
- Lower uncertainty increases the ST benefits, as price responses are larger

$$\frac{\partial^2 P_t}{\partial e_t \, \partial a_0} = 1/r > 0.$$

- Higher market pressure (e.g., π) increases ST benefits and lowers LT costs, raise b^*

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Prices as Capitalized Weighted Average Reported Earnings

$$
\begin{aligned}
P_t &= \sum_{k=1}^{\infty} \frac{\mathbb{E}_t\left[e^*_{t+k}\right] + \bar{b} - c(\bar{b})}{(1+r)^k} \\
&= \sum_{k=1}^{\infty} \frac{\sum_{j=0}^{\infty} a_j \hat{e}^*_{t-j} + \bar{b} - c(\bar{b})}{(1+r)^k} \\
&= \frac{1}{r}\left(\sum_{j=0}^{\infty} a_j \hat{e}^*_{t-j} + \bar{b} - c(\bar{b})\right) \\
&= \frac{1}{r}\left(\sum_{j=0}^{\infty} a_j [e_{t-j} + c(\bar{b}) - \bar{b}] + \bar{b} - c(\bar{b})\right) \\
&= \frac{1}{r}\sum_{j=0}^{\infty} a_j e_{t-j} \text{ since the weights } (a_j) \text{ sum to one.}
\end{aligned}
$$

Fisher & Verrecchia (TAR 2000): Setup

- One period reporting game with risk neutral manager and a perfectly competitive risk neutral market
- True firm value unknown ex ante, and prior distribution of value is common knowledge

$$\tilde{v} \sim \mathcal{N}(\mu_v, \sigma_v^2)$$

- During the period, manager privately observes earnings, which serves as a noisy signal of firm value

$$\tilde{e} = \tilde{v} + \tilde{n}$$

where $\tilde{n} \sim \mathcal{N}(\mu_n, \sigma_n^2)$ and $\sigma_{\tilde{n},\tilde{v}} = 0$ which is **common knowledge**

- Once managers observe earnings of $\tilde{e} = e$, can report r by adding a bias ($b = r - e$), but in doing so bears a private cost

$$C(b) = cb^2/2$$

where c is a positive parameter and $C(.)$ convex (similar to Stein, 1989)

  - ⋆ Unlike Stein (1989), this is not a "real" EM problem in that there's no cost to the firm's LT earnings or value

- Market does not observe the realization of $\tilde{e}$ and sets price based on rational expectations of $\tilde{v}$ conditional on manager's earnings report

$$P = \mathbb{E}[\tilde{v}|r]$$

Fisher & Verrecchia (TAR 2000): Managerial Incentives

- Manager has SR incentives (e.g., due to compensation structure) to boost/tank earnings and prices but also has LR incentives (e.g., due to litigation, reputation, or psychic costs):

$$\max_b \; x \cdot P - c \cdot \frac{b^2}{2}$$

where x reflects the degree of manager's SR incentives but is unknown to the market, which has a common prior

$$\tilde{x} \sim \mathcal{N}(\mu_x, \sigma_x^2) \text{ and } \sigma_{\tilde{x},\tilde{v}} = \sigma_{\tilde{x},\tilde{n}} = 0$$

nb x can be positive or negative, and xP captures the benefit manager obtains by biasing the report. Thus, σ_x captures the uncertainty in manager's reporting objectives.

- ↪ Managers may want to boost earnings if he has a lot of equity that he wants to unload
- ↪ Managers may want to take big bath if he is expecting new option grants and wants low strike prices
  - ⋆ This generalizes from Stein (89), which assumes that manager's incentives are known to investors

Fisher & Verrecchia (TAR 2000): Equilibrium

- Assuming a linear equilibrium, in which

$$\begin{aligned} b(e,x) &= \lambda_e \cdot e + \lambda_x \cdot x + \delta \\ P(r) &= \underbrace{\beta}_{\text{“}ERC\text{”}} \cdot r + \alpha \end{aligned}$$

Fisher and Verrecchia (2000) show...

1. $b^*(e,x) = \frac{\beta^*}{c}x$ and $r^* = e + \frac{\beta^*}{c}x$
   - ↪ Bias operates in the direction of incentives $sign(b^*) = sign(x)$
   - ↪ Bias larger in magnitude when prices respond more to earnings reports (larger β^*)
   - ↪ Bias smaller in magnitude when more costly to manager

2. $P = \underbrace{\frac{\sigma_v^2}{\sigma_v^2 + \sigma_n^2 + \left(\frac{\beta^*}{c}\right)^2 \sigma_x^2}}_{\beta^*} \left(r - \frac{\beta^*}{c}\mu_x\right)$
   - ↪ Market pricing of earnings reports varies based on uncertainty about reporting objectives. Essentially a price-to-earnings valuation model.

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Fisher & Verrecchia (TAR 2000): Key Results

3. $\beta^* = \frac{\sigma_v^2}{\sigma_v^2+\sigma_n^2+\left(\frac{\beta^*}{c}\right)^2\sigma_x^2}$

↪ If there is no uncertainty about manager's reporting objectives ($\tilde{x} = \mu_x$ a.s. and thus $\sigma_x = 0$), then

$$\beta^* = \frac{\sigma_v^2}{\sigma_v^2 + \sigma_n^2}$$

i. ERC lower when market has more precise signal about market value or know that manager has less precise signal about firm value (in both cases earnings have less value)

ii. This is the same result/intuition as Stein (1989): if there's no uncertainty about reporting objectives, market can perfectly back out the true earnings and the manipulation and price the firm appropriately; reporting bias does not add noise to the earnings report or its information content.

↪ When there is uncertainty about manager's reporting objectives ($\sigma_x > 0$), market is unable to perfectly adjust for the bias, weakening its ability to perfectly back out "true" earnings, resulting in inverse relation between ERC and σ_x

Toy Model

From Fischer and Verrecchia (TAR 2000), in the baseline period (before incentive revelation), market prices are given by

$$P_0 = \underbrace{\frac{\sigma_v^2}{\sigma_v^2 + \sigma_n^2 + \left(\frac{\beta_0^*}{c}\right)^2 \sigma_x^2}}_{\beta_0^*} \left(\underbrace{e_0 + \frac{\beta_0^*}{c} x}_{r_0^*} - \frac{\beta_0^*}{c} \mu_x \right).$$

After revelation, x is known ($\mu_x = x$ and $\sigma_x^2 = 0$), s.t.

$$P_1 = \underbrace{\frac{\sigma_v^2}{\sigma_v^2 + \sigma_n^2}}_{\beta_1^*} (e_1).$$

Key Predictions

1. ERC increases after revelation: $\beta_1^* > \beta_0^*$
2. Price changes depends on direction of revelation

$$\frac{P_1}{P_0} = \underbrace{\frac{\sigma_v^2 + \sigma_n^2 + \left(\frac{\beta_0^*}{c}\right)^2 \sigma_x^2}{\sigma_v^2 + \sigma_n^2}}_{\textit{ERC/Multiples Effect}} \underbrace{\frac{ce_1}{ce_0 + \frac{\beta_0^*}{c}(x - \mu_x)}}_{\textit{LT Earnings/Incentives Effect}}$$

$$= \frac{1 + \left(\frac{\beta_0^*}{c}\right)^2 \frac{\sigma_x^2}{\sigma_v^2 + \sigma_n^2}}{1 + \left(\frac{\beta_0^*}{c}\right)^2 \frac{x - \mu_x}{\beta_0^* e_1}}$$

where we assume that true earnings in both periods remain the same $e_1 = e_0$.

↪ Revelation leads to price increase iff the increase in earnings multiple or ERC outweighs the reduction in estimated LT earnings

$$\frac{\sigma_x^2}{\sigma_v^2 + \sigma_n^2} > \frac{x - \mu_x}{\beta_0^* e_1}$$

If the revelation did not imply too much of a (upward) manipulation compared to priors

Estimating ERC and Role of Analyst Forecast Precision

Want to estimate β^* via:

$$dP = \beta^* \underbrace{d(r^* - \bar{E})}_{\substack{\text{surprise rel} \\ \text{to investor} \\ \text{forecasts}}}$$

$$dP = \beta^* \underbrace{d(r^* - \bar{E}^A)}_{\substack{\text{surprise rel} \\ \text{to analyst} \\ \text{forecasts}}}$$

1. If analyst forecasts approximate investor expectations with *random* error (ω)...
   $\hat{\beta} = \frac{\beta}{1 + \frac{Var(\omega)}{Var(\omega) + Var(Surprise)}}$
   - ↪ The "ERC" effect could capture the fact that analyst forecasts better capture investor expectations
2. If analyst forecasts = investor expectations, and forecasts are becoming more precise...
   - ↪ Note: in the model, the precision in *comes from* clarity about incentives, thus analyst forecast precision would be consistent with transparency increase under the maintained assumption

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