When the Thin Bench Gets Thinner: The Effects of Investment Bank Consolidation on Municipal Finance

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Job Talk Practice
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Motivation

- On September 17, 2024, the DOJ updated its 1995 Bank Merger Guidelines
- What stays the same?
  - Every M&As among *deposit-taking* institutions are subject to review and approval
  - Mandatory divestiture when M&A satisfies presumption of harm to competition
- What is new?
  - Lower threshold on Δ_{HHI} for presumption of harm: $200 \Rightarrow 100$
  - Narrower market definition, considerations beyond price, etc.

- Both the old and new guidelines have overlooked the *investment banking* industry
  - The scarcity of research is a major reason

Motivation

- Investment banks, chief among them security underwriters, are important
- Security issuance is a pillar of the financial system
- In the U.S. in 2022, the total amounts of new issuance are
  - Corporate equity: $102 billion
  - Corporate bond: $883 billion
  - Municipal bond: $410 billion

- Do the market structure and market power of security underwriters matter?

- Do powerful underwriters make security issuance expensive?
  - Underwriters are rightfully compensated for the skills demanded and risks involved?
  - Or, do underwriters possess market power and earn economic profits?

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Motivation

Short on financial knowledge, some school districts get bad deals on bonds

Districts can fall prey to financial firms that put their own interests first

by **SARAH BUTRYMOWICZ** and **NICHOLE DOBO**
April 22, 2019

Investigate Midwest:

- Issuers (school districts) can "*easily be taken advantage of—urged to issue needless or poorly structured bonds, pushed to accept high interest rates or duped into paying hundreds of thousands in unreasonable fees*"

Motivation


FINANCIAL TIMES

myFT

US

+ Add to myFT

OECD criticises high fees and tacit collusion in IPO underwriting

Costs for European issues about half that paid by US and Japanese companies

OECD:

- "*(For corporate IPOs,) high levels of fees and parallel pricing (akin to tacit collusion) appear to have increased (in recent years)*"
- This could have contributed to the "*decline in the number of companies tapping the public equity markets over the past decade*"

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Motivation

- To study underwriters' market power, an instinctive strategy is to use M&As as a shifter of market power

- The municipal bond primary market has several advantages:
  - Finances key public infrastructure and services
  - High geographical fragmentation
  - Significant consolidating activities among local and regional underwriters
  - A vast amount of heterogeneous issuers
  - Stable flows of issuance driven by public needs
  - $\Rightarrow$ An ideal natural laboratory

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Research Question

1. Do M&As among municipal bond underwriters lead to higher underwriting fees?
2. If so, can the evidence be viewed as these underwriters having market power?
3. From the standpoint of issuers, do these M&As lead to efficiency gains that could offset the rise in fees?
4. Do these M&As have a quantity effect on the amount of new issuance?

Overview of Findings

1. The underwriting spread rises by $\approx 5\%$ of its sample mean after within-market consolidation
2. Effects double for larger deals and in more concentrated markets
3. Examinations of M&As less prone to endogeneity concerns, combined with three placebo tests, help establish causality
4. Efficiency gains, if any, are too small to offset the rise in the underwriting spread
5. Using Census data, I validate my prior findings and show a reduction in new issuance

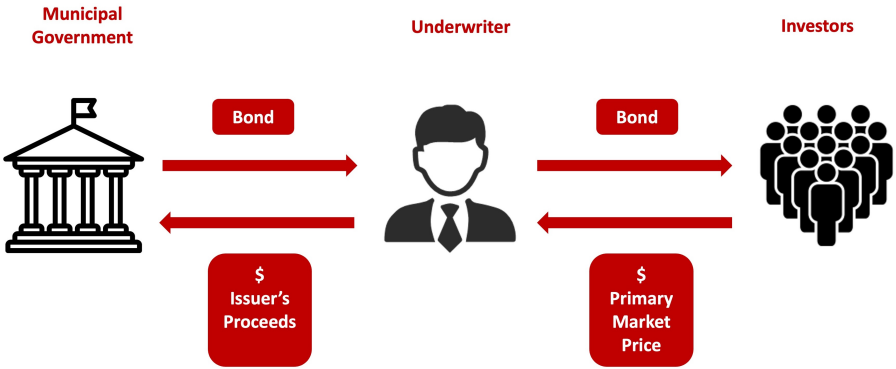
Related Literature

- Underwriter market power: Chen and Ritter (2000), Manconi et al. (2019), Cestau (2019), Cestau (2020), Garrett and Ivanov (2024)
- Financial institution M&As: Prager and Hannan (1998), Berger et al. (1999), Sapienza (2002), Focarelli and Panetta (2003), Garmaise and Moskowitz (2006), Erel (2011) Fraisse et al. (2018), Nguyen (2019), Ratnadiwakara and Yerramilli (2022)
  - Mine is the first paper on the effects of investment bank consolidation
- Municipal bond market: Butler et al. (2009), Cornaggia et al. (2017), Adelino et al. (2017), Gao et al. (2019), Dougal et al. (2019), Painter (2020), Butler and Yi (2022), Goldsmith-Pinkham et al. (2023), Garrett (2024), Cao et al. (2024), and many more

Data and Sample

- Municipal bond issuances
  - Source: SDC Platinum Global Public Finance Database
  - Main outcome variable: Underwriting spread expressed as a fraction of the principal amount
- M&A sample:
  - I hand-collect M&As among municipal bond underwriters active in 1970-2022
  - I complement the sample with SDC Platinum M&A Database and SNL Financial M&A Database
  - 258 M&A deals, among which 162 have geographic overlaps

Institutional Details



Underwriting Spread ($) = Primary Market Price – Issuer's Proceeds

- Underwriters (1) assume inventory risks (2) exert marketing and distributing efforts

Institutional Details

Negotiated Sales

Issuer selects underwriter via a "Request for Proposal" process

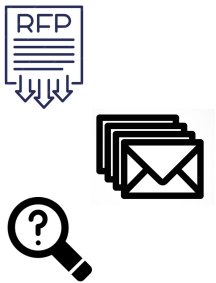
Institutional Details

Negotiated Sales

Issuer selects underwriter via a "Request for Proposal" process

↓

Underwriter analyzes and gauges investors' interest in bonds



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Underwriter buys bonds and then redistribute to investors

Back

Institutional Details

Competitive Bidding

Issuer decides on offering terms with the help of financial advisor

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Issuer decides on offering terms with the help of financial advisor

Issuer sets up an auction and underwriters place bids for the bonds

Institutional Details

- An auction has a median (mean) number of 4 (4.1) bidders

pfm Observation

Auction Date	Type	Start	End	Last Update	Status
Thu., Apr 4, 2024	AON	11:00:00 am	11:15:01 am	11:17:11 am EDT	Over

Auction Closed At 11:15:01 am

NOTICE: Equal/Ascending YTMs required for Bonds on/after 2/15/27

$32,490,000*
Perkiomen Valley School District, Montgomery County, Pennsylvania
General Obligation Bonds,
Series of 2024

	Bidder	Firm	TIC	Time
1st	JANN-MD	Janney Montgomery Scott	3.060000%	11:13:01 am
2nd	KEYB-RC	KeyBanc Capital Markets	3.083135%	11:14:03 am
3rd	JPMO-JM	JP Morgan Securities	3.089346%	11:14:02 am
4th	RWBA-DK	Robert Baird	3.092640%	11:14:06 am
5th	BAKE-JV	The Baker Group LP	3.170847%	11:14:53 am
6th	BANC-AC	Bancroft Capital, LLC	3.183230%	11:11:55 am

*Preliminary, subject to change

Institutional Details

Competitive Bidding

Issuer decides on offering terms with the help of financial advisor

↓

Issuer sets up an auction and underwriters place bids for the bonds

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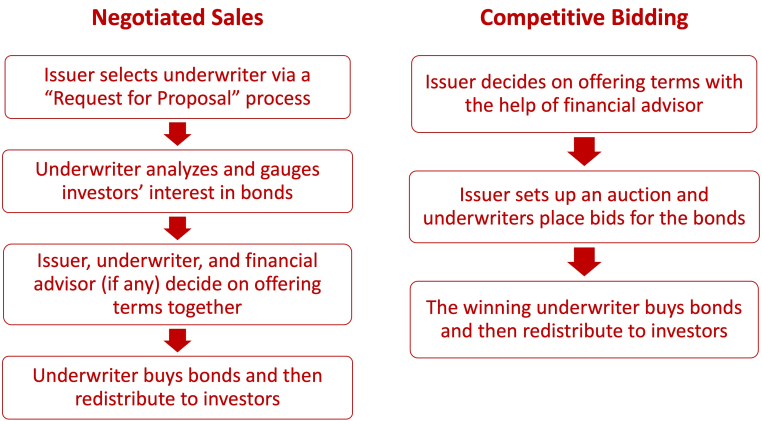
The winning underwriter buys bonds and then redistribute to investors

Institutional Details



- Negotiated sales: Underwriting spread largely determined in "Request for Proposal"
- Competitive bidding: Underwriting spread = Primary market price - Winning bid

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Data and Sample: Geographic Fragmentation

- Average cosine similarity of underwriters for a state-pair is More
  - Corporate equity: 0.508
  - Corporate bond: 0.613
  - Municipal bond: 0.193
- The municipal bond underwriting market is much more geographically fragmented
- Reasons for the highly fragmented form:
  - Local underwriters have better access to same-state investors, who are the prominent owners of municipal bonds due to tax advantages (Babina et al., 2020)
  - Local governments' favoritism over local businesses
  - Accumulated, substantial experience in underwriting for nearby governments (Butler, 2008)

Data and Sample: Geographic Fragmentation

Underwriter in CA	Market Share in CA	Underwriter in MA	Market Share in MA
Stifel Nicolaus	14.9%	Eastern Bank	15.4%
Piper Sandler	11.8%	Century Bank	7.2%
Citigroup	7.1%	TD Bank	7.1%
RBC Bank	6.6%	Robert W Baird	5.9%
Morgan Stanley	5.6%	Jefferies	5.1%
Raymond James	5.4%	JP Morgan	4.6%
Stone & Youngberg	5.3%	Morgan Stanley	4.4%
Bank of America	4.8%	Bank of America	4.2%
De La Rosa	3.6%	Fidelity Capital Markets	3.9%
JP Morgan	3.4%	Janney Montgomery Scott	3.6%

Table: Top Ten Municipal Bond Underwriters in 2010-2020 in CA and MA

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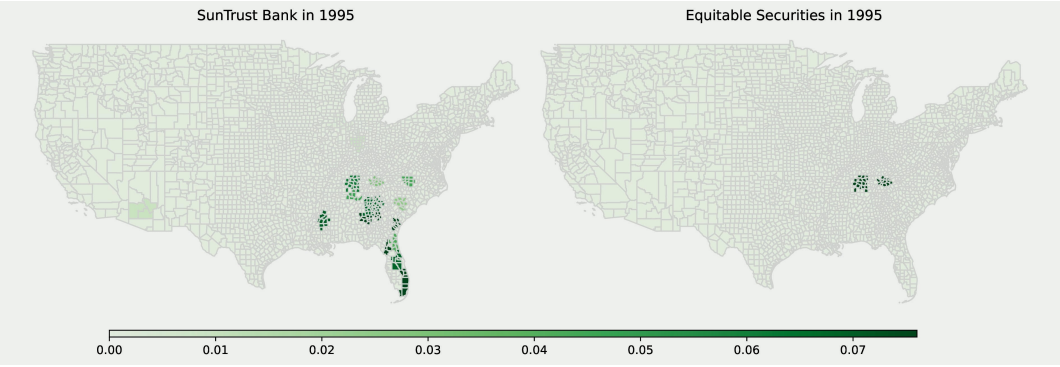
Data and Sample

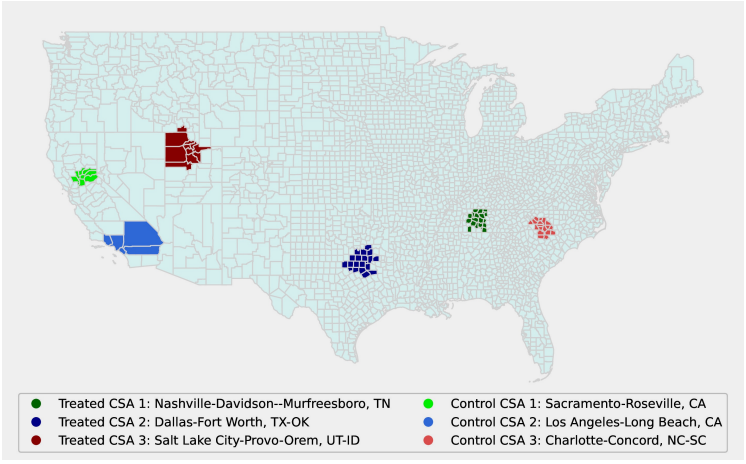
- Market: A Combined Statistical Area (CSA), 218 in the U.S.
- Treated: CSAs where M&As would lead to *predicted* Δ_{HHI} >= 100
  - $\Rightarrow$ 219 local consolidation episodes



More

Data and Sample

Control: One CSA that is closest in terms of population and income per capita, and not affected by within-market M&As during $[-4, +4]$



Main Findings: Effects on Underwriting Spread

- I estimate a stacked DID (Gormley and Matsa, 2011, 2016):

$$y_{d,c} = \beta_1 Post_{c,t} + \beta_2 Treated_{a,c} \times Post_{c,t} + \theta_{i,c} + \theta_t + e_{d,c}$$

  where
  - d is for each bond issuance, i.e., each deal
  - a is for each Combined Statistical Area (CSA)
  - c is for each cohort of treated and control CSAs
  - i is for each issuer
  - t is for the calendar year
  - Double-cluster SEs at CSA and year levels

- Theoretically, the direction of the effect is unclear
  - M&As can bolster market power and raise underwriting spread
  - Alternatively, M&As can create synergies and reduce marginal cost, which might get pass on to issuers as lower prices

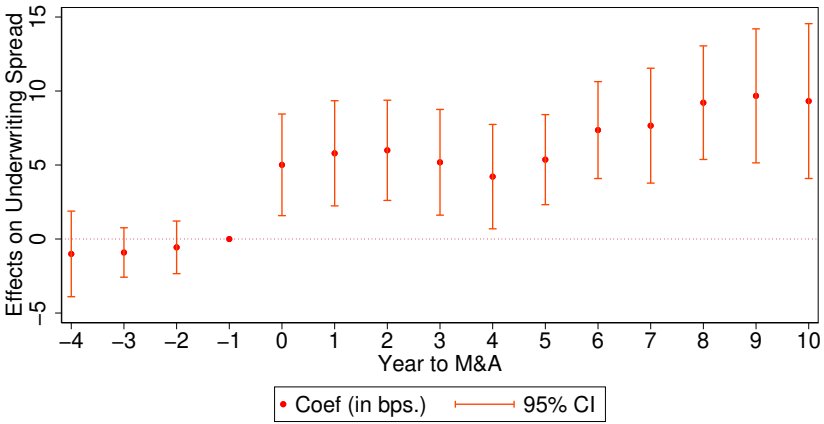
Main Findings: Effects on Underwriting Spread

	Predicted Δ_{HHI} >= 100	Market Share >= 5%	*Predicted* $\Delta_{Top\ 5\ Share}$ >= 5%
	(1)	(2)	(3)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	4.98***	4.48***	4.42***
	(3.15)	(4.47)	(2.68)
Observations	79,642	148,352	74,250
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.529	0.513	0.506

M&As that would lead to *predicted* Δ_{HHI} >= 100

$\Rightarrow$ A 5.0 bps. increase in underwriting spread from a sample mean of 103.0 bps.

Main Findings: Effects on Underwriting Spread



Main Findings: Robustness Tests

- Include state × calendar year fixed effects
- Include underwriter × calendar year fixed effects
- Include issuer-underwriter-match × cohort fixed effects
- Include fixed effects for bond characteristics interacted with calendar years

- Control for the principal amount, length of maturity, and their squared terms
- Control for whether CBs are eligible to underwrite the bond issue by law

- Define the market at the finer CBSA level

- Use two or three matches or a sample without matching
- Match on local demographic and economic trends and issuance outcomes
- Use propensity score matching

- Address critics in Baker et al. (2022)
- Apply corrective weights proposed in Wing et al. (2024)

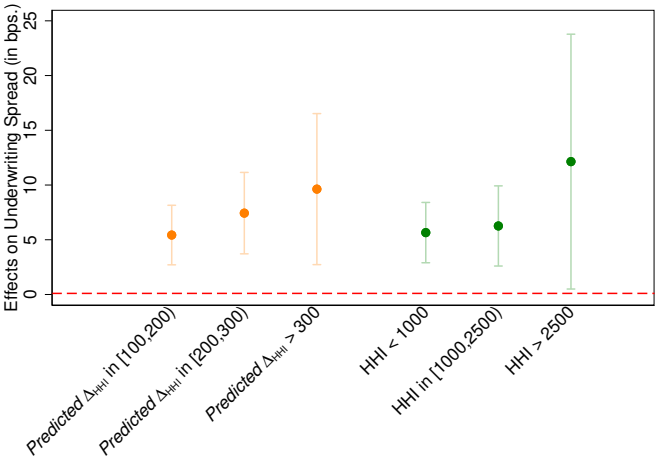
Main Findings: Effects on Underwriting Spread

Going from 5 equal-sized underwriters to 4 equal-sized underwriters
$\Rightarrow$ A rise in the underwriting spread by 22.3 basis points

	OLS	IV - First Stage	IV - Second Stage
	(1)	(2)	(3)
	Underwriting Spread (bps.)	HHI	Underwriting Spread (bps.)
HHI	-0.00		0.04**
	(-0.97)		(2.11)
Treated × Post		111.60**	
		(2.59)	
Observations	79,642	79,642	79,642
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.529	0.823	

Main Findings: Effects on Underwriting Spread

Consistent with increased market power:



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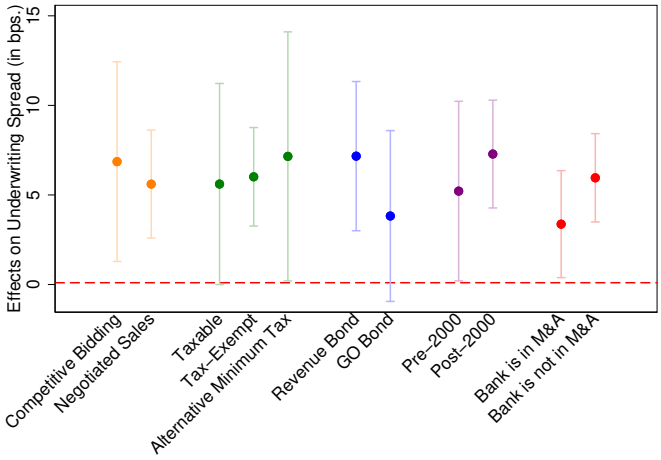

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Main Findings: Addressing Endogeneity Concerns

- Main concerns:
  - Omitted Variable Bias: Local economic dynamics drive both M&As among underwriters and the underwriting spread
  - Reverse Causality: Underwriters merge because they anticipate future changes in underwriting spread in the local market
- Effects hold when
  - #1: Consider only scenarios where the consolidation-affected markets account for a small fraction of the total underwriting businesses of the merging underwriters (Garmaise and Moskowitz, 2006; Dafny et al., 2012; Sunderam and Scharfstein, 2017)
  - #2: Consider only M&As for which the rationales, according to news articles, are unrelated to the local economy (Romer and Romer, 2010)

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CSA	Significance of CSA for RBC Bank	Significance of CSA for Dain Bosworth	
Minneapolis-St. Paul, MN-WI	10.6%	9.5%	✗
Albuquerque-Santa Fe-Los Alamos, NM	5.4%	3.9%	✗
Milwaukee-Racine-Waukesha, WI	2.2%	1.9%	✓
Brownsville-Harlingen-Raymondville, TX	2.1%	1.8%	✓
Omaha-Fremont, NE-IA	1.0%	1.0%	✓

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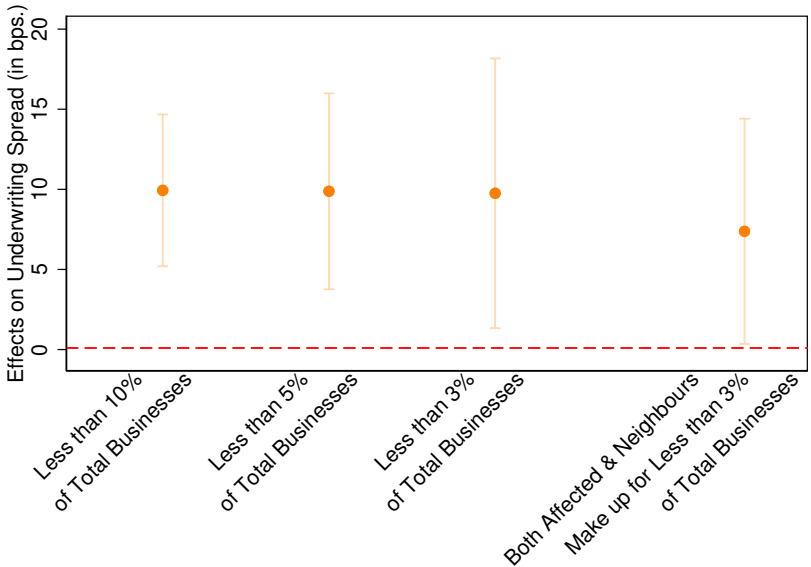

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Main Findings: Addressing Endogeneity Concerns

PNC Bank & Midlantic Bank, 1995

The Morning Call: *"The move, along with PNC Bank's pending acquisition of 84 branches of Chemical Bank New Jersey, will strengthen PNC Bank's position in the New Jersey and Philadelphia markets, placing it second in those areas."*

⇒ **The acquiror's desire to gain local/regional dominance**

Main Findings: Addressing Endogeneity Concerns

Stifel Nicolaus & City Securities, 2016

Indianapolis Business Journal: *"'Post Dodd-Frank, one of the effects that it had on the entire industry was to lay a lot of additional regulatory costs on everybody—probably disproportionately on smaller firms,' Bosway (City Securities CEO Mike Bosway) said. 'So that was clearly a factor in considering this more so than I had in the past. The need for scale today, because of that, is greater than it ever had been.'"*

$\Rightarrow$ **Synergy from cost management**

Main Findings: Addressing Endogeneity Concerns

Morgan Stanley & Dean Witter Reynolds, 1997

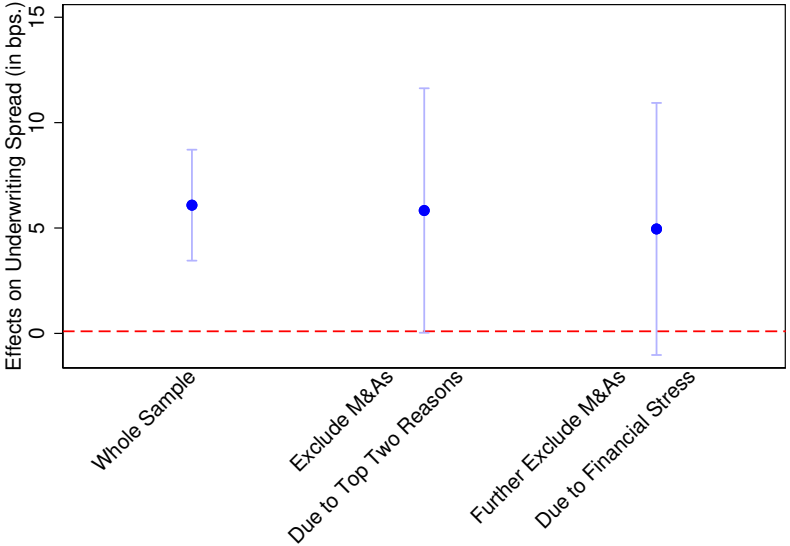
The New York Times: *"In recent years, as the securities markets have changed, however, both firms started to covet what the other had. Dean Witter's 9,300 brokers needed more products to sell to the firm's Main Street customers, specifically the initial public offering stocks and municipal bonds that Morgan Stanley frequently underwrites. Morgan Stanley, meanwhile, wanted to broaden its customer base beyond its corporate clients and large institutions to the individual investors who have been flocking to the market."*

$\Rightarrow$ **Synergy from combining different lines of business**

Main Findings: Addressing Endogeneity Concerns

Reason for M&A	Count
The acquiror's desire to gain local/regional dominance	24
The acquiror's desire to expand geographically	19
The acquiror's desire to gain industry-wide dominance	15
Synergy from combining different lines of business	14
Financial stress of the target	13
Synergy from cost management	12
The acquiror's desire to diversify its revenue sources	12
Acquiror or target's desire to fend off a hostile takeover	1

Main Findings: Addressing Endogeneity Concerns



Main Findings: Placebo Tests

Effects are absent for

- #1: Cross-market underwriter M&As
  - $\Rightarrow$ Results are not driven by factors that lead to M&A activities of underwriters in general
- #2: Within-market (purely) commercial bank M&As
  - $\Rightarrow$ Results are not driven by factors that lead to within-market consolidation of financial institutions in general
- #3: Within-market withdrawn underwriter M&As
  - $\Rightarrow$ Results are not driven by factors that lead to both successful and withdrawn M&As

Main Findings: Placebo Tests

	Market Share >= 10%		Market Share > 0%	
	(1)	(2)	(3)	(4)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	-3.01	-0.26	-0.22	1.19
	(-1.36)	(-0.13)	(-0.14)	(0.67)
Observations	33,997	54,052	118,497	113,959
Year FE	Yes	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year	CSA & Year
If Similar Population	No	Yes	No	Yes
Adjusted R-squared	0.607	0.608	0.588	0.580

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Main Findings: Placebo Tests

Trace out geographical distribution of CBs using Summary of Deposits (Cetorelli and Strahan, 2006; Kundu, Park, and Vats, 2022)

	Predicted $\Delta_{CB\ HHI}$ >= 100	*Predicted* $\Delta_{CB\ HHI}$ >= 50	*Predicted* $\Delta_{CB\ HHI}$ >= 20
	(1)	(2)	(3)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	1.45	3.76	3.33
	(0.55)	(1.41)	(1.44)
Observations	10,969	15,883	20,014
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.521	0.535	0.547

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Main Findings: Placebo Tests

	Predicted Δ_{HHI} >= 50	*Predicted* Δ_{HHI} >= 20	*Predicted* Δ_{HHI} >= 10
	(1)	(2)	(3)
	Underwriting Spread (bps.)	Underwriting Spread (bps.)	Underwriting Spread (bps.)
Treated × Post	-5.80	-9.85	6.02
	(-0.49)	(-1.71)	(0.58)
Observations	129	1,358	3,972
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.168	0.471	0.384

Efficiency Gains

Two major themes of M&A research: Market power and efficiency gains (Berger et al., 1999)

- Do issuers benefit from efficiency gains that could compensate for the rise in the underwriting spread?

I examine potential efficiency gains on two fronts:

- Lower bond yield?
- Reduced need for other issuer-paid services?
  - Bond insurance, credit ratings, and financial advisors

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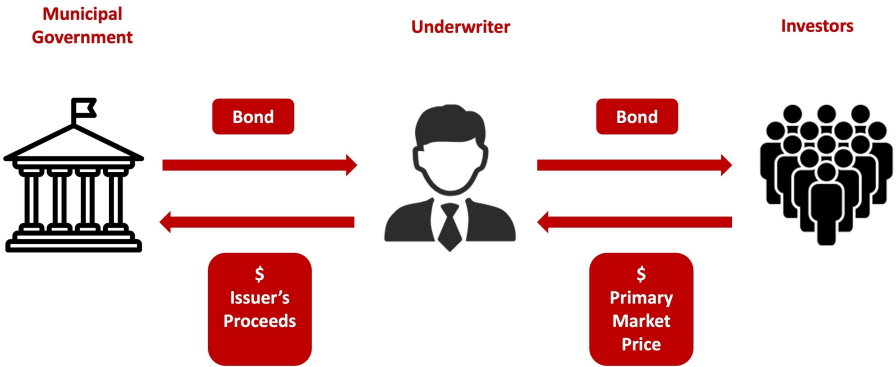


- Underwriters might gain stronger abilities to market and distribute the bonds
  - Higher primary market price, i.e., lower bond yield at initial offering
- However, under Negotiated Sales, powerful underwriters might instead precipitate higher yield at initial offering Back

Efficiency Gains: Bond Yield

Outcome variables:

- Yield at Initial Offering: Yield-to-maturity based on the price at which the underwriter resells the bond to initial investors
  - Mean = 351.0 bps.
- Yield Spread: Spread between municipal bond and U.S. treasury securities at the initial offering
  - Mean = 90.1 bps.
- Initial Underpricing: Day 15-30 trading price minus initial trading price
  - Mean = \$0.4 per \$100 face value

Efficiency Gains: Bond Yield

	(1) Yield at Initial Offering (bps.)	(2) Yield Spread over Treasury (bps.)	(3) Yield Spread over Treasury (bps.)	(4) Initial Underpricing ($)	(5) Initial Underpricing ($)
Treated × Post	-4.69	-2.72		0.09**	
	(-0.78)	(-1.14)		(2.61)	
Treated × Post × Competitive Bidding			-5.37		-0.02
			(-1.24)		(-0.30)
Treated × Post × Negotiated Sales			-1.70		0.15***
			(-0.84)		(3.37)
Observations	157,522	143,905	143,905	33,248	33,248
Year FE	Yes	Yes	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.693	0.393	0.406	0.131	0.140

Efficiency Gains

Two major themes of M&A research: Market power and efficiency gains (Berger et al., 1999)

- Do issuers benefit from efficiency gains that could compensate for the rise in the underwriting spread?

I examine potential efficiency gains on two fronts:

- Lower bond yield?
- Reduced need for other issuer-paid services?
  - Bond insurance, credit ratings, and financial advisors

Efficiency Gains: Other Issuer-Paid Services

Outcome variables:

- If using bond insurance
  - Mean = 18.7%, average cost = 80.4 bps.
- If using credit ratings
  - Mean = 15.4%, average cost = 12.4 bps.
- If using financial advisors
  - Mean = 49.2%, average cost = 49.8 bps.

- I can observe *if* any issuance is using these three services, but their costs are only available for California and Texas
  - I predict expected costs for all issuances following Cornaggia et al. (2022)

Efficiency Gains: Other Issuer-Paid Services

	(1) Has Rating (%)	(2) Insured Ratio (%)	(3) Has Advisor (%)
Treated × Post × Bank not in M&A	-1.40	-1.24	-1.12
	(-0.89)	(-0.76)	(-1.06)
Treated × Post × Bank is in M&A	-2.31	-2.36	-1.98
	(-1.46)	(-1.63)	(-1.45)
Observations	249,168	249,168	249,168
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.401	0.413	0.625

Efficiency Gains: Overall Measure

- Total issuing cost = underwriting spread + three kinds of other fees

VARIABLES	(1) Total Issuing Cost (bps.)	(2) Total Issuing Cost (bps.)	(3) Total Issuing Cost (bps.)
Treated × Post	5.15**	3.40**	4.07*
	(2.48)	(2.31)	(1.93)
Observations	78,549	146,195	73,388
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.497	0.479	0.481

- Consistent findings using a "Modified True Interest Cost" Findings

Local Government Finances

- Data: The Annual Survey of State and Local Government Finances conducted by the U.S. Census Bureau
- Motivation:
  - Validate findings from issuance-level outcomes
  - Fully quantify the total effects of M&As on local government financing costs
    - Municipal bond issuances can have complex features beyond the underwriting spread and yield at initial offering (Brancaccio and Kang, 2024)
  - Examine the quantity effects
- Outcome variables:
  - Interest Paid/Total Expenditures » Interpretation
  - New Issuance/Total Expenditures

Local Government Finances

I estimate

$$y_{l,t,c} = \beta_1 Post_{c,t} + \beta_2 Treated_{a,c} \times Post_{c,t} + \theta_{l,c} + \theta_t + e_{l,t,c},$$

where

- l is for each local government
- a is for each Combined Statistical Area (CSA)
- c is for each cohort of treated and control CSAs
- t is for the calendar year
- Double-cluster SEs at CSA and year levels

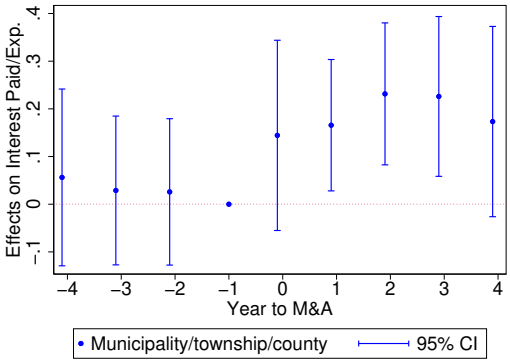
Local Government Finances

	(1) Interest Paid/ Exp. (in %)	(2) New Issuance/ Exp. (in %)
Panel A: Municipality/township/county		
Treated × Post	0.16*	−0.31
	(1.84)	(−1.14)
Panel B: School district		
Treated × Post	−0.02	−1.20***
	(−0.53)	(−2.70)
Government × Cohort FE	Yes	Yes
Year FE	Yes	Yes
Clustering	CSA & Year	CSA & Year

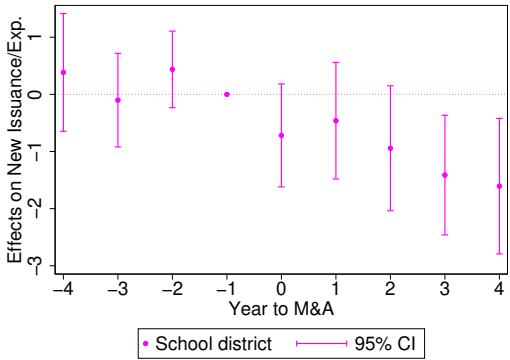
- Municipalities/townships/counties: Interest paid rises by 5.4% of the sample mean
- School districts: New issuance drops by \$178.9 (t = -2.19) and expenditure changes by -\$279.7 (t = -1.60) per student

Local Government Finances

Panel A: Interest paid/exp.



Panel B: New issuance/exp.



Conclusion

- The underwriting spread for municipal bonds rises after underwriter consolidation
- Cross-sectional heterogeneities are consistent with a market power interpretation
- Effects hold in scenarios where endogeneity concerns are less likely
- Efficiency gains, if any, are insufficient to offset the rise in the underwriting spread
- Census data confirm increased financing costs and show reduced new issuance

- The findings provide a novel perspective on bank antitrust regulations
  - The investment banking industry demands antitrust attention
  - Narrower market definition in settings with geographical segmentation
  - Regulators can adopt simple rules based on historical data
  - Arguments for consumer benefits from M&As require evidence

⏩ More Discussion

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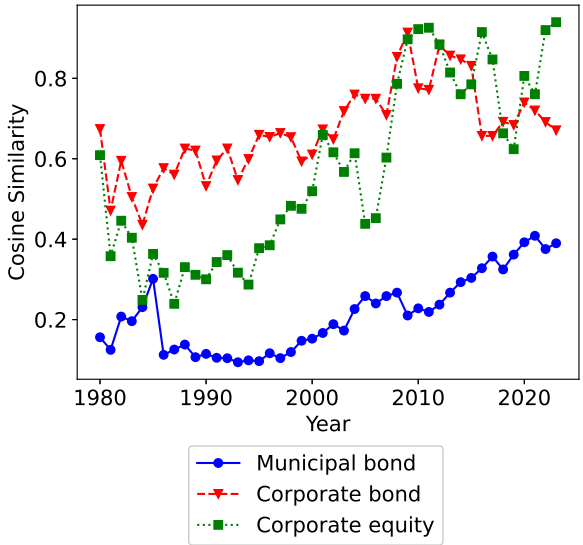
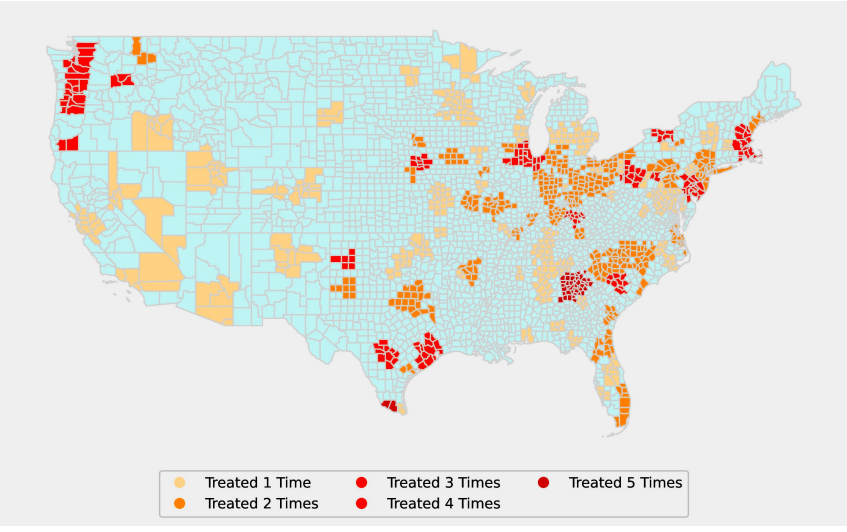
Data and Sample: Geographic Fragmentation



Data and Sample: Frequency of Treatments



Back

Main Findings: Effects on Underwriting Spread

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)
Treated × Post	5.79*	3.69**	3.91*	5.22***
	(1.98)	(2.32)	(2.00)	(3.21)
Observations	79,552	78,417	57,112	79,642
Year FE			Yes	Yes
Issuer × Cohort FE	Yes	Yes		Yes
State × Year FE	Yes			
Underwriter × Year FE		Yes		
Issuer × Underwriter × Cohort FE			Yes	
Clustering	CSA & Year	CSA & Year	CSA & Year	CSA & Year
Weights	None	None	None	Wing et al. (2024)
Adjusted R-squared	0.540	0.621	0.671	0.553

Table: Robustness Tests to Alternative Regression Specifications, Part I Back

Main Findings: Effects on Underwriting Spread

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)
Treated × Post	3.84**	4.50***	4.41***
	(2.21)	(2.82)	(2.78)
If Commercial Banks Eligible			-15.92***
			(-8.17)
Observations	79,641	64,664	79,642
Controls		Yes	
Year FE		Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Taxable × Year FE	Yes		
Method of Sale × Year FE	Yes		
Source of Repayment × Year FE	Yes		
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.548	0.577	0.533

Table: Robustness Tests to Alternative Regression Specifications, Part II Back

Main Findings: Effects on Underwriting Spread

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)	(5) Underwriting Spread (bps.)
Treated × Post	4.03**	3.84**	3.80***	3.90***	3.36**
	(2.63)	(2.51)	(2.79)	(2.89)	(2.52)
Observations	103,956	123,364	76,104	79,527	1,000,870
Year FE	Yes	Yes	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year	CSA & Year	CSA & Year
Number of Matches	2	3	1	1	Unlimited
Matching Co-variates	Local Income and Population	Local Income and Population	Local Income and Population plus Demographics Dynamics	Local Income and Population plus Issuance Outcomes	None
Adjusted R-squared	0.513	0.511	0.535	0.529	0.537

Table: Robustness Tests to Alternative Matching Back

Main Findings: Effects on Underwriting Spread

	(1) *Predicted* Δ_{HHI}	(2) $1_{Predicted\ \Delta_{HHI} \geq 100}$ ×100	(3) Underwriting Spread (bps.)	(4) Underwriting Spread (bps.)
Treated × Post			5.12***	4.60**
			(3.16)	(2.49)
Prior HHI	-0.0016	-0.0012***	0.00	0.00
	(-0.84)	(-4.13)	(1.28)	(1.46)
Population	0.0001	-0.0000		-0.01**
	(0.12)	(-0.17)		(-2.47)
Population Growth Rate	324.0629	68.8836*	-4.13	40.94
	(1.65)	(1.98)	(-0.05)	(0.55)
Income	0.0185	0.0820		0.00
	(0.02)	(0.56)		(0.01)
Income Growth Rate	-18.6023	-5.8455		-32.58
	(-0.20)	(-0.36)		(-1.01)
Age	2.1907	-0.0606		-2.37
	(1.19)	(-0.20)		(-0.68)
Minority Ratio	64.4586	2.8297		232.36
	(1.03)	(0.34)		(1.58)
Past Issuance Per Capita	-0.0022	0.0000		-0.00
	(-1.30)	(0.01)		(-0.57)
Observations	8,357	8,357	79,109	79,109
Year FE	Yes	Yes	Yes	Yes
CSA × Cohort FE			Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.064	0.082	0.529	0.529

Main Findings: Effects on Underwriting Spread

VARIABLES	(1) Underwriting Spread (bps.)
Treated × Post	6.02***
	(4.23)
Observations	71,247
Year FE	Yes
Issuer × Cohort FE	Yes
Clustering	CSA & Year
Number of Matches	1
Matching Co-variates	Propensity Score
Adjusted R-squared	0.524

Table: Robustness to Matching on Propensity Score Back

Main Findings: Effects on Underwriting Spread

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)
Treated × Post	4.94	4.31*
	(1.19)	(1.98)
Observations	17,419	70,402
Year FE	Yes	Yes
Issuer × Cohort FE	Yes	Yes
Clustering	CSA & Year	CSA & Year
Number of Matches	1	1
Matching Co-variates	Local Income and Population	Local Income and Population
Restrictions	Treated Once	Requiring No Prior Treatment
Adjusted R-squared	0.492	0.522

Table: Robustness Tests to Addressing Concerns in Baker et al. (2022) Back

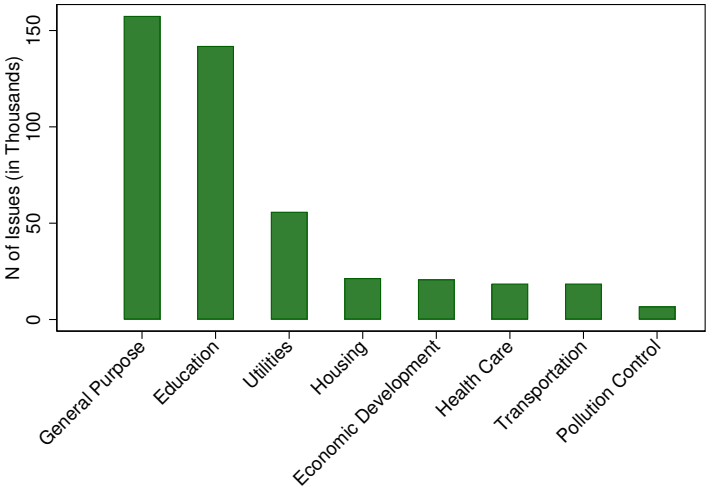
Main Findings: Effects on Underwriting Spread

	(1) Underwriting Spread (bps.)	(2) Underwriting Spread (bps.)	(3) Underwriting Spread (bps.)
Treated × Post	7.04***	5.84***	7.71***
	(4.18)	(3.79)	(4.81)
Observations	76,821	125,303	63,450
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CBSA & Year	CBSA & Year	CBSA & Year
Adjusted R-squared	0.536	0.528	0.531

Table: Robustness Tests to Defining Markets at the CBSA Level Back

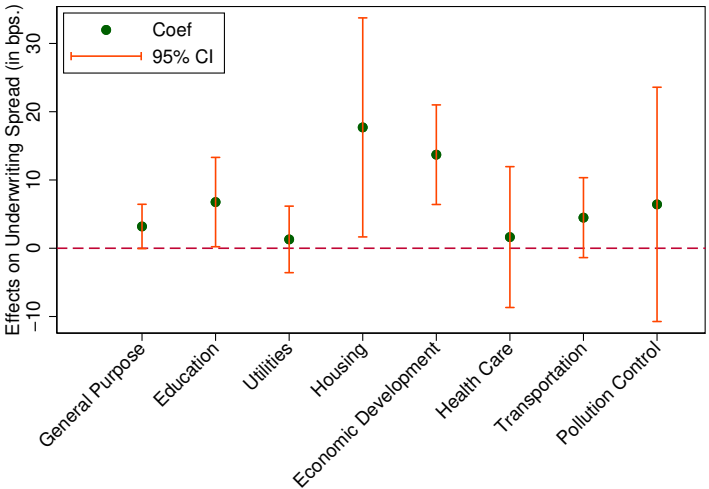
Main Findings: Effects on Underwriting Spread

Figure: Effects by the Main Use of Proceeds



Main Findings: Effects on Underwriting Spread

Figure: Effects by the Main Use of Proceeds Back



Main Findings: Addressing Endogeneity Concerns

PNC Bank & Midlantic Bank, 1995

The Morning Call: *"The move, along with PNC Bank's pending acquisition of 84 branches of Chemical Bank New Jersey, will strengthen PNC Bank's position in the New Jersey and Philadelphia markets, placing it second in those areas."*

⇒ **The acquiror's desire to gain local/regional dominance**

Back

Main Findings: Addressing Endogeneity Concerns

RBC Bank & Dain Bosworth, 2000

The Wall Street Journal: *"The acquisition, which is subject to approval by regulators and Dain Rauscher shareholders, would give Royal Bank the toehold it has long sought in the U.S. wealth-management market."*

⇒ **The acquiror's desire to expand geographically**

Back

Main Findings: Addressing Endogeneity Concerns

JP Morgan & Banc One, 2004

The New York Times: *"The merger would create a financial behemoth and a true rival to the world's largest banking company, Citigroup , with $1.1 trillion in assets and 2,300 branches in 17 states."*

⇒ **Acquiror's desire to gain industry-wide dominance**

Back

Main Findings: Addressing Endogeneity Concerns

Morgan Stanley & Dean Witter Reynolds, 1997

The New York Times: *"In recent years, as the securities markets have changed, however, both firms started to covet what the other had. Dean Witter's 9,300 brokers needed more products to sell to the firm's Main Street customers, specifically the initial public offering stocks and municipal bonds that Morgan Stanley frequently underwrites. Morgan Stanley, meanwhile, wanted to broaden its customer base beyond its corporate clients and large institutions to the individual investors who have been flocking to the market."*

⇒ **Synergy from combining different lines of business**

Back

Main Findings: Addressing Endogeneity Concerns

Wells Fargo & First Security, 2000

The New York Times: *"(First Security) operates similar to a savings institution, with a business that is generally weighted toward low-return products like mortgage and car loans. 'The mortgage business has gotten really crushed in this rate environment,' Mr. Ryan (of the research firm Byrne-Ryan) said. 'But Wells Fargo is one of the top operators in the mortgage business and is well positioned to resuscitate First Security.'"*

⇒ **Financial stress of the target (vulnerability to the rate environment)**

Back

Main Findings: Addressing Endogeneity Concerns

Capital One Financial & North Fork Bank, 2008

The New York Times: "*'With North Fork, Capital One will be more balanced and more diversified and my growth prospects will be enhanced,' Mr. Fairbank said during a conference call today with investors and analysts. 'That is a very important milestone in a journey that started many years ago.'*"

⇒ **Acquiror's desire to diversify its revenue sources**

Back

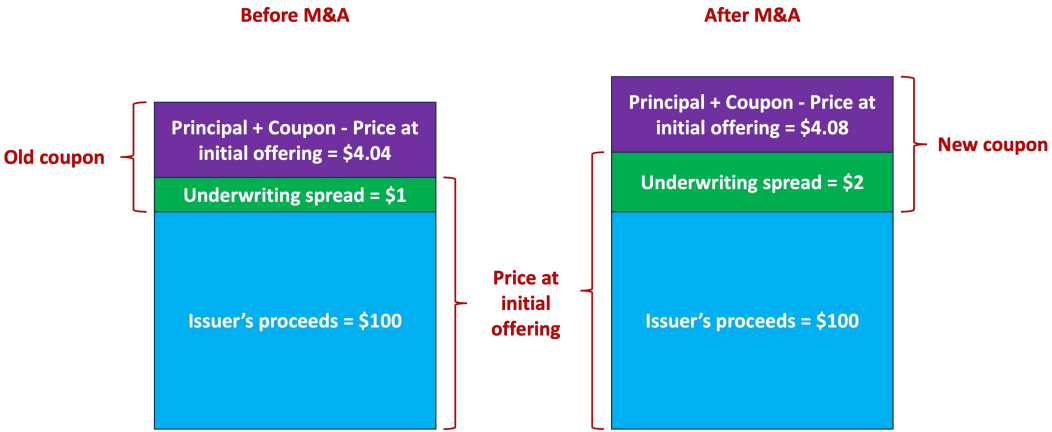
Main Findings: Effects on Underwriting Spread

- "Modified True Interest Cost" accounts for
  - Underwriting spread
  - Bond yield at initial offering
  - Costs of three other kinds of issuer-paid services

	Predicted Δ_{HHI} >= 100	Market Share >= 5%	*Predicted* $\Delta_{Top\ 5\ Share}$ >= 5%
	(1)	(2)	(3)
	Modified TIC Spread (bps.)	Modified TIC Spread (bps.)	Modified TIC Spread (bps.)
Treated × Post	8.22*	10.41**	9.83**
	(1.70)	(2.09)	(2.31)
Observations	55,132	99,728	50,860
Year FE	Yes	Yes	Yes
Issuer × Cohort FE	Yes	Yes	Yes
Clustering	CSA & Year	CSA & Year	CSA & Year
Adjusted R-squared	0.410	0.390	0.407

Back

Local Government Finances



- "Interest paid" reflects coupon amount rather than yield at initial offering

Back

Discussion

- My findings echo research on market power in corporate security underwriting
  - Staffs in corporations might have more effective financial training
  - However, potential collusive benefits per deal is greater for corporate securities
  - I call for future research building on the contribution of Chen and Ritter (2000) and Manconi et al. (2019)
- My findings are not at odds with the secular trend in underwriting spread
  - In a counterfactual absent consolidation, the underwriting spread would be lower
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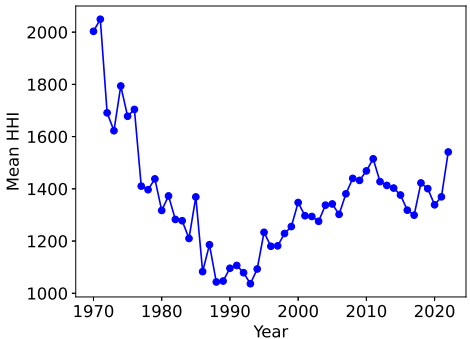
Local Government Finances

Panel A: HHI



Panel B: Underwriting spread

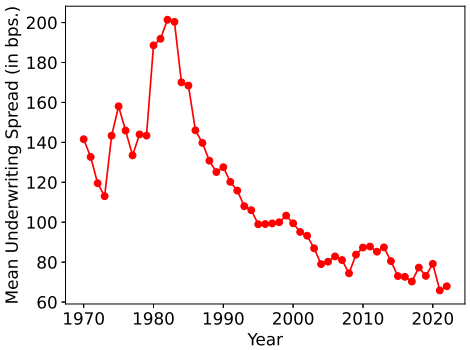


Figure: Time trends, 1970-2022

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  - In a counterfactual absent consolidation, the underwriting spread would be lower
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Discussion

- My findings echo research on market power in corporate security underwriting
  - Staffs in corporations might have more effective financial training
  - However, potential collusive benefits per deal is greater for corporate securities
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