

Discussion of
Corporate Bond Use in Asia and the U.S.
Duffee and Hördahl

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Research Questions

- What determines a firm's decision to issue public debt?
 - Extensive margin
 - Intensive margin
- How well do firm-specific variables explain differences in bond leverage between U.S. and Asian firms?
- How do variations in various uses of funds determine whether firms issue bank loans or public debt?

What Does it Find?

- Asian firms are significantly less likely to issue public debt.
- Firm characteristics account for little of the difference between bond leverage of U.S. and Asian firms. Other unobserved factors matter a great deal.
- Firms use bank debt to fund variations in operating cash flows.
- Asian firms use relatively more bank debt to fund capital expenditures. Banks play an important role in firm financing.

Disentangling Supply From Demand

- How important is access to bond markets in a firm's decision to issue public debt?
- If firms in Asia have less public debt, then is it because of:
 - Supply frictions: “infrastructure problem”
 - Demand considerations: given the characteristics of firms and their environment, bank financing adds more value.
 - Corporate governance
 - Limited and low quality information about firms
 - Inefficient liquidation during bankruptcy
 - Information frictions and monitoring efficiency

Comments: Sample, Outcome Variable, and Explanatory Variables

- We can make cleaner inferences if we:
 - Restrict the sample to firms in Asia that are similar to US firms (matched samples).
 - Use $Mix = \text{Bonds} / (\text{bank loans} + \text{bonds})$ instead of $\text{Bank Debt} / \text{Assets}$ and $\text{Bond} / \text{Assets}$
 - *Explanatory variables*: Firm age, R&D intensity, Rated?, variability of cash flows.
- Omitted variables bias
 - Include firm fixed effects. LRZ show that not including firm fixed effects could significantly bias the coefficient estimates in leverage regressions.
 - Include Industry \times Country, Industry \times Year, Country \times Year effects.

Table 4: Bond Leverage Dummy

	U.S.		Asia		Asia ex China	
largest size	0.81*** (0.02)	0.68*** (0.02)	0.65*** (0.02)	0.58*** (0.02)	0.76*** (0.03)	0.70*** (0.03)
Size Q1	-0.36*** (0.03)	-0.30*** (0.03)	-0.60*** (0.02)	-0.59*** (0.02)	-0.69*** (0.02)	-0.67*** (0.02)
Size Q2	-0.43*** (0.04)	-0.38*** (0.03)	-0.50*** (0.02)	-0.48*** (0.02)	-0.57*** (0.03)	-0.56*** (0.03)
Size Q3	-0.48*** (0.03)	-0.42*** (0.03)	-0.47*** (0.02)	-0.45*** (0.02)	-0.49*** (0.03)	-0.49*** (0.03)
Size Q4	-0.34*** (0.03)	-0.32*** (0.03)	-0.36*** (0.03)	-0.35*** (0.02)	-0.34*** (0.03)	-0.33*** (0.03)
$(MA/BA)_{t-1}$	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
$(NI/MA)_{t-1}$	-0.17* (0.09)	-0.06 (0.09)	-0.43*** (0.07)	-0.32*** (0.06)	-0.50*** (0.07)	-0.42*** (0.07)
$(PPE/MA)_{t-1}$	0.23*** (0.05)	0.00 (0.05)	0.05** (0.02)	-0.06** (0.02)	-0.02 (0.02)	-0.09*** (0.02)
$(Debt/MA)_{t-1}$		0.81*** (0.06)		0.34*** (0.03)		0.25*** (0.03)
R^2	0.17	0.24	0.19	0.21	0.22	0.24

Comments: Profitability and Bond Issuance Decisions

- Profitability results are consistent with costly adjustment (Frank and Goyal (2015)).
- Firms don't fully adjust profitability shocks because of adjustment costs.
- This results in a negative relation between leverage and profitability.
- We expect adjustment costs to be greater for firms in Asia. The coefficient on profitability is greater for firms in Asia.

Importance of Information Frictions: Index Membership and Bond Issuances

Goyal, Urban and Zhao (2018) DID Setting

Model	1	2	3	4	5	6	7
Window (years)	[-1,1]	[-2,2]	[-3,3]	[-3,3]	[-3,3]	[-3,3]	[-3,3]
Sample			Stock inclusions				Stock deletions
Dep. variable	Market leverage		Book leverage		Public debt ratio	Private debt ratio	Market leverage
Treated x Post	0.011** (0.004)	0.015*** (0.005)	0.017*** (0.006)	0.019*** (0.005)	0.011** (0.005)	0.001 (0.007)	-0.004 (0.010)
Post	-0.003 (0.004)	-0.005 (0.004)	-0.010** (0.005)	-0.010** (0.005)	-0.008** (0.004)	-0.001 (0.005)	0.019 -0.018
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,460	38,433	51,439	51,439	56,412	56,412	6,531
Treated	11,816	20,587	29,277	29,277	37,659	37,659	3,754
Adjusted R ²	0.91	0.881	0.843	0.837	0.740	0.790	0.896

Index Membership: International Variation

Goyal, Urban and Zhao (2018)

Model	1		2		3		4		5		6	
Window (years)	[-3,3]											
Dep. variable:	Market leverage											
Sample split	Disclosure				Accounting				CR			
	Low		High		Low		High		Low		High	
Treated x Post	0.027*** (0.009)	0.004 (0.009)	0.021** (0.009)	0.003 (0.007)	-0.002 (0.007)	0.042*** (0.011)						
Post	-0.015** (0.007)	0.018** (0.009)	-0.015* (0.008)	0.011* (0.007)	0.001 (0.005)	-0.026*** (0.009)						
Observations	27,739		8,679		16,344		13,278		32,572		18,867	
Control variables	Yes		Yes		Yes		Yes		Yes		Yes	
Firm FE	Yes		Yes		Yes		Yes		Yes		Yes	
Year x Industry FE	No		No		No		Yes		Yes		Yes	

Index Membership: Country Regressions

Goyal, Urban and Zhao (2018)

Country	China	France	Germany	Greece	Hong Kong	India	Japan	Singapore	South Korea	United Kingdom	United States
Treated x Post	-0.016 (0.013)	0.029* (0.016)	0.043* (0.024)	0.018 (0.044)	0.045 (0.034)	0.084*** (0.020)	-0.006 (0.026)	0.051 (0.036)	0.044* (0.023)	-0.005 (0.021)	<0.000 (0.009)
Post	0.012 (0.008)	-0.029* (0.017)	-0.018 (0.019)	-0.029 (0.040)	-0.030 (0.035)	-0.05*** (0.016)	0.090** (0.038)	-0.049 (0.037)	-0.025 (0.027)	0.012 (0.016)	0.007 (0.009)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,936	3,868	3,103	2,409	7,860	1,333	1,373	2,181	1,064	3,374	6,498
Adjusted R ²	0.839	0.807	0.738	0.775	0.792	0.843	0.934	0.716	0.879	0.652	0.822

Supply Frictions are Important

- Disclosure standards
- Rating standards
- Protection of property rights

Persistence, Measurement Errors, and Adjustment Costs

Table 6

	U.S.	Asia	Asia ex China
largest size	0.37*** (0.04)	0.21*** (0.03)	0.25*** (0.04)
I_{t-1}	0.59*** (0.05)	0.72*** (0.03)	0.70*** (0.05)
Size Q1	-0.17*** (0.05)	-0.18*** (0.03)	-0.21*** (0.04)
Size Q2	-0.27*** (0.05)	-0.14*** (0.03)	-0.16*** (0.04)
Size Q3	-0.28*** (0.05)	-0.15*** (0.03)	-0.15*** (0.04)
Size Q4	-0.24***	-0.12***	-0.12***

- Measurement errors
- Adjustment speeds: transactions cost differences between Asia and US

Do firms finance their cash deficits with bank loans or bonds?

- Benefits and costs of bank debt versus corporate debt:
 - Information frictions and monitoring
 - Ease of renegotiation. Inefficient liquidation
 - Managing liquidity
- We expect firms in Asia to rely more on bank financing if:
 - Asian firms face more information frictions, i.e., they are small, unrated, have more volatile cash flows, information intensive assets, and less analyst following
 - Liquidation is inefficient and costly.
 - Moral hazard problems are more severe in Asia.
- **Exploit cross-sectional heterogeneity**

Empirical Approach

Accounting Cash Flow Identity

$$\begin{aligned} DEF_t &= DIV_t + I_t + \Delta W_t - C_t \\ &\equiv \Delta D_t + \Delta E_t \end{aligned}$$

Does the identity hold?

The paper estimates:

$$\begin{aligned} \frac{\Delta Bank_{i,t}}{S_{i,t}} &= b_0 + b_1 \frac{\Delta Cash_{i,t}}{S_{i,t}} + b_2 \frac{-CashOps_{i,t}}{S_{i,t}} + b_3 \frac{\Delta PPE_{i,t}}{S_{i,t}} \\ &+ b_4 \frac{\Delta Intan_{i,t}}{S_{i,t}} + e_{i,j,t} \end{aligned}$$

Table 10

Region (Obs)	Debt Type	Component of Demand for Cash				R^2
		Change in Cash	Negative Cash from Operations	Change in PPE	Change in Intang Assets	
China (453)	Bank	0.22** (0.10)	0.27*** (0.09)	0.43*** (0.07)	0.37*** (0.14)	0.27
	Bond	0.12** (0.05) [-0.95]	0.13** (0.06) [-1.29]	0.12** (0.05) [-3.58]	0.08 (0.15) [-1.42]	0.06
Other Asia (2451)	Bank	0.14*** (0.04)	0.22*** (0.03)	0.33*** (0.02)	0.27*** (0.04)	0.19
	Bond	0.18*** (0.04) [0.66]	0.08*** (0.02) [-3.70]	0.14*** (0.02) [-6.22]	0.17*** (0.03) [-1.90]	0.07
US (5722)	Bank	0.05* (0.03)	0.16*** (0.02)	0.24*** (0.03)	0.22*** (0.02)	0.16
	Bond	0.20*** (0.03) [3.70]	0.06*** (0.02) [-3.85]	0.26*** (0.02) [0.56]	0.18*** (0.02) [-1.35]	0.16

Comments on Table 10

- Cash flow from operations includes changes in working capital.
 - Variation in working capital to be largely absorbed by bank debt.
- Financing of long-term assets and use of bank loans versus bonds.
 - How do we understand this result? What frictions are driving it?
- Financing of PPE versus intangible assets
 - Intangible assets include acquired R&D and patents. Information intensive assets.
 - Expected to be financed largely through bank debt.
- Financing of cash buildup: Saving cash out of cash flow versus opportunistic issue of corporate bonds
- **Cross-sectional heterogeneity:** Which U.S. firms are financing long-term assets via bank debt?

Comments: Transaction Costs

- How volatile are the cash flows? And, deficits?
 - Could higher bank debt volatility be a result of greater variability of cash flows.
- Relative differences in bond issuance costs?
- What do firms do with proceeds of bond issues? Account for all of the uses.

Table 2: Country?

Table 2. Summary Statistics for Leverage Ratios by Country

The table reports means and medians for bond and bank leverage of non-financial firms with publicly traded equity. The text describes the sample in detail. The observations are firm-years, where fiscal years range from 2003 to 2016. Bond leverage is total bond debt to assets. Bank leverage is total bank debt to assets. Assets are either book value of assets or market value of assets, measured as book liabilities plus the market value of equity.

	Number of obs.	Leverage using book equity				Leverage using market equity			
		Bond		Bank		Bond		Bank	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
China	19803	0.02	0.00	0.22	0.20	0.01	0.00	0.14	0.10
Hong Kong	6258	0.03	0.00	0.16	0.13	0.03	0.00	0.18	0.13
India	23797	0.01	0.00	0.26	0.24	0.01	0.00	0.28	0.25
Indonesia	1870	0.04	0.00	0.26	0.23	0.03	0.00	0.24	0.19
Malaysia	8074	0.02	0.00	0.20	0.17	0.02	0.00	0.22	0.18
Philippines	1003	0.03	0.00	0.17	0.14	0.02	0.00	0.15	0.11
Singapore	3441	0.01	0.00	0.20	0.17	0.01	0.00	0.20	0.16
South Korea	10348	0.06	0.00	0.18	0.15	0.05	0.00	0.19	0.14
Thailand	4458	0.04	0.00	0.22	0.19	0.04	0.00	0.20	0.15
all Asia	79052	0.03	0.00	0.22	0.19	0.02	0.00	0.21	0.16
United States	29102	0.13	0.04	0.15	0.08	0.09	0.02	0.10	0.05

Conclusion

- The paper is asking an important question:
 - “Why do firms in Asia use less corporate debt than firms in the U.S.?”
- Important to understand if the low use of corporate bonds by Asian firms reflects:
 - Supply frictions: Do firms face greater supply frictions that prevent firms from issuing corporate bonds.
 - Demand factors: Other frictions make bank debt relatively cheaper for Asian firms.
- Have made some suggestions to sharpen inferences.