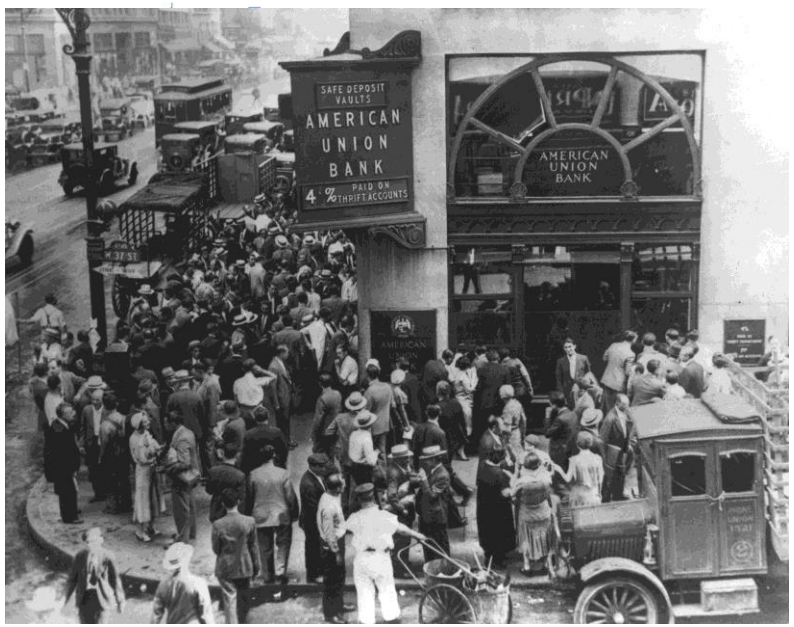
CHULALONGKORN
BUSINESS SCHOOL

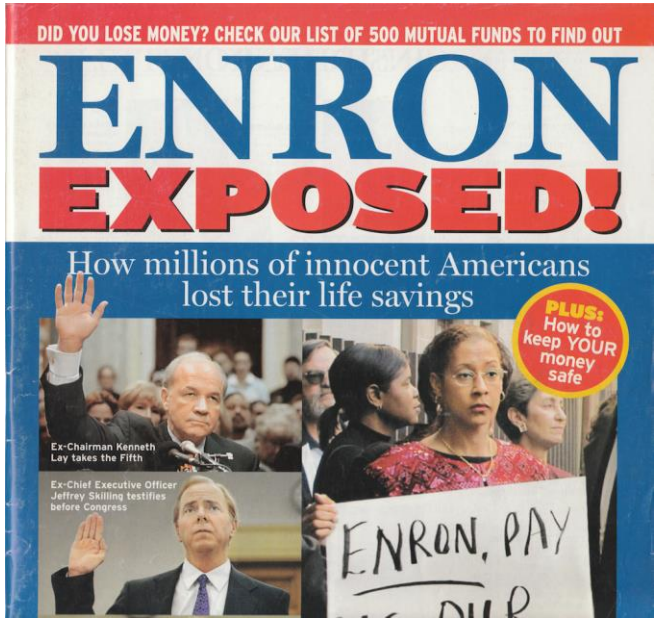
FLAGSHIP FOR LIFE

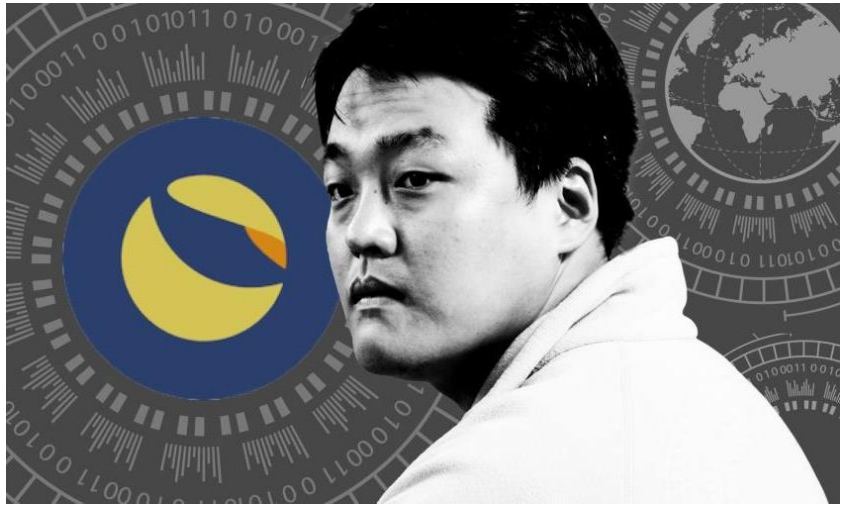
PIER Research Workshop 2025

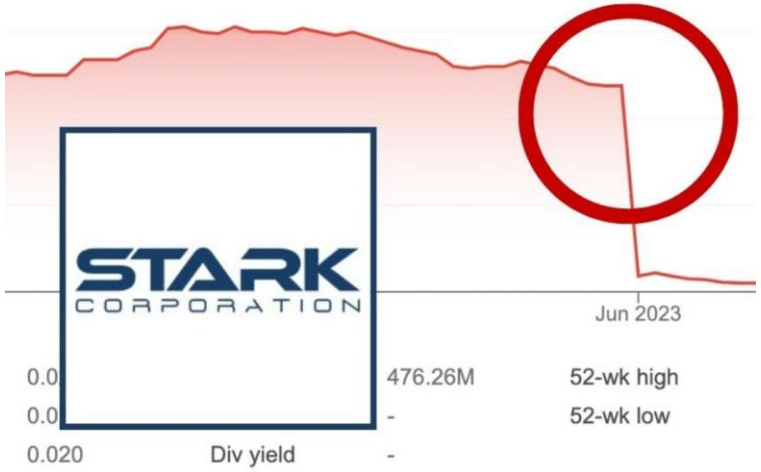
Financial Mismatches

Kanis Saengchote
Chulalongkorn Business School
dr-kanis.com









FINANCIAL MISMATCHES

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Finance Research Letters 64 (2024) 105435

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Digital money creation and algorithmic stablecoin run☆

Kanis Saengchote[a,*], Krislert Samphantharak[b]

[a] Chulalongkorn Business School, Thailand
[b] University of California San Diego, United States

ARTICLE INFO

Keywords:
Digital money
Algorithmic stablecoin
DeFi
Bank run
Regulation

ABSTRACT

This study examines the downfall of Iron Finance's algorithmic stablecoin in June 2021 and draws parallels with the Terra–Luna (UST) collapse in May 2022. Using transaction-level blockchain data, we dissect the events leading to Iron Finance's failure, unveiling algorithmic stablecoins' inherent vulnerabilities. We highlight the disproportionate impact on retail investors, a pattern also mirrored in UST, where confidence erosion led to a similar destabilizing 'bank run.' Our analysis contributes to the broader understanding of the fragility of DeFi ecosystems and sheds light on the risks of adopting permissionless blockchains and algorithmic stablecoins as payment infrastructures and forms of digital money.

1. Introduction

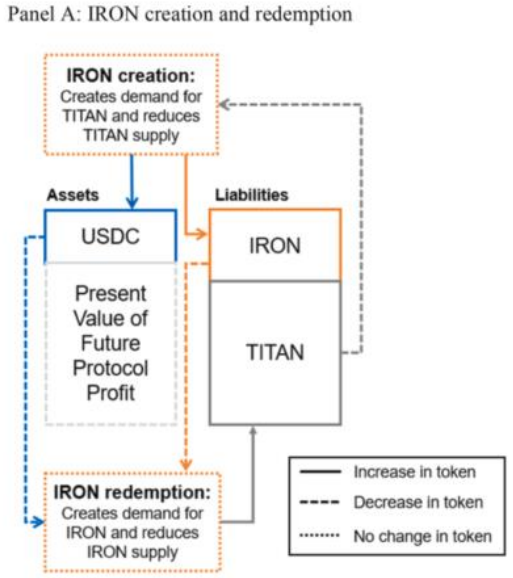
Stablecoins are digital tokens on blockchain networks. They are designed to peg their exchange rates to currencies, drawing comparisons to traditional money. With the global reach of permissionless blockchains, stablecoins issued on these open networks promise to revolutionize payments. In June 2019, Facebook unveiled its plan to create Libra, a digital currency on its blockchain network.[1] The growing size, usage, and interconnections of stablecoins and blockchain-based digital money alarmed monetary authorities and policymakers concerned about the potential impact on global financial stability and the risks of 'liquidity runs' that stablecoin issuers face, especially when backed by risky or opaque assets (G7 Working Group on Stablecoins, 2019; Arner et al., 2020; ECB Crypto-Assets Task Force, 2020; Adachi et al., 2021; Liao and Caramichael, 2022).

Tokens, digital information created by developers, can be programmed to specify their creation (minting), transfer, or destruction (burning). Typically, issuers can 'guarantee' token creation and redemption at a fixed exchange rate (e.g., $1 per unit), classifying them as stablecoins. These creations and redemptions are primary market transactions, and when secondary market prices differ from the peg, arbitrage opportunities exist.

A stablecoin is a new, privately issued money. In a paper that relates stablecoins to pre-Civil War U.S. private banknotes, Gorton, Ross and Ross (2022) began by quoting Hyman Minsky: "Everyone can create money; the problem is to get it accepted." Thus,

☆ We thank the editor and reviewers for their comments and helpful suggestions that improved and clarified this manuscript. This paper was previously circulated as "A DeFi Bank Run: Iron Finance, IRON Stablecoin, and the Fall of TITAN."
* Corresponding author at: Chulalongkorn Business School, Chulalongkorn University, Phayathai Road, Pathumwan, Bangkok 10330, Thailand.
E-mail address: kanis@cbs.chula.ac.th (K. Saengchote).
[1] See, for example, https://www.cnbc.com/2019/06/17/facebook-announces-libra-digital-currency-calibra-digital-wallet.html.

https://doi.org/10.1016/j.frl.2024.105435
Received 6 January 2024; Received in revised form 15 April 2024; Accepted 17 April 2024
Available online 18 April 2024



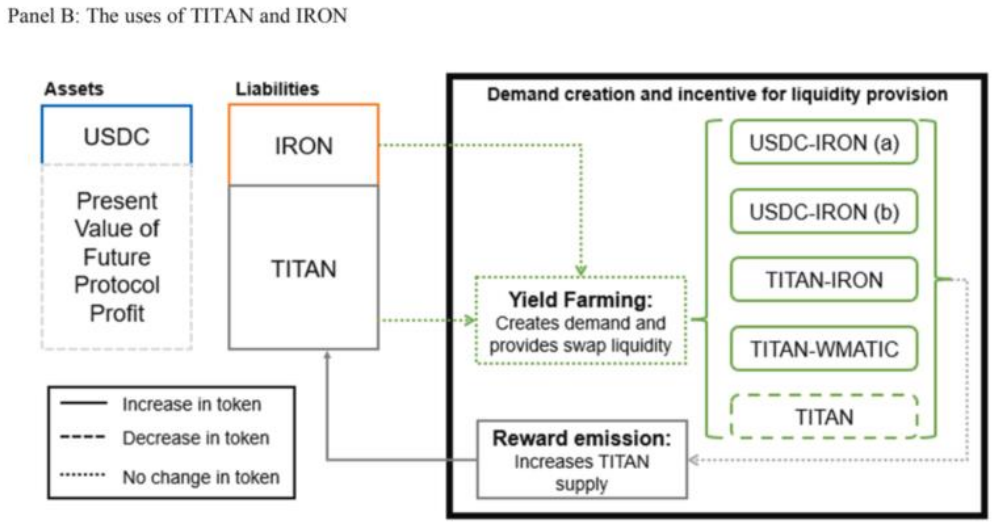


Fig. 3. Overview of iron finance protocol.
This figure illustrates the schematics of how different tokens in Iron Finance are created (minted), redeemed (burned), and used to provide a decentralized financial service (DeFi) via smart contract codes. IRON is the stablecoin, TITAN is the governance token, and USDC is another stablecoin not issued by the Iron Finance protocol. Panel A presents IRON's creation and redemption process from the protocol's view of asset liabilities. Panel B illustrates how IRON and TITAN can earn yield in the form of TITAN rewards, which in turn creates demand for IRON and TITAN.

Example: algorithmic stablecoin

Most of money in circulation today is debt, so stablecoins are prone to:

- Asset-liability mismatch
- Liquidity mismatch
- i.e., "bank run"

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

AIG's gallows humor gives bankers a laugh

By **Reuters**

October 12, 2008 3:53 AM GMT+7 · Updated October 12, 2008

Aa

WASHINGTON (Reuters) - Insurance giant American International Group, on the receiving end of a multi-billion dollar bailout from the Federal Reserve, was trying hard on Saturday to look on the bright side of life.

"Credit markets do not function. Why not, because the word credit comes from credibility," AIG Vice Chairman Jacob Frenkel told a group of top global bankers at a lively luncheon where he took a philosophical view of the upheaval in financial markets.

"The **left** side of the balance sheet has **nothing right**, and the **right** side of the balance sheet has **nothing left**.
But they are equal to each other. So, accounting-wise we are fine."

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

"ถ้าสตาร์คจะต้องใช้ระยะเวลาฟื้นฟู-แก้ปัญหาถึง 10 ปี ฉันคงไม่มีชีวิตอยู่แล้ว"

สภาองค์กรของผู้บริโภค

วัชชิรานนท์ ทองเทพ
ผู้สื่อข่าวบีบีซีไทย

23 มิถุนายน 2023

"พูดตรง ๆ นะ มีคนเขาถามฉันอยู่คำหนึ่งว่า ถ้าบริษัทสตาร์คจะต้องใช้ระยะเวลาในการฟื้นฟูหรือแก้ปัญหาถึง 10 ปี ฉันคงไม่มีชีวิตอยู่แล้ว" ผู้ถือหุ้นกู้สูงวัยรายหนึ่งบอกกับบีบีซีไทย

นี่คือข้อความจาก มาลี (นามสมมติ) หนึ่งในผู้ถือหุ้นกู้ของ บมจ. สตาร์ค คอร์ปอเรชั่น ที่ต้องการสื่อสารไปยังผู้บริหารของบริษัทที่เธอยอมรับว่า ครั้งหนึ่งเคยเชื่อมั่นและเชื่อใจที่จะนำเงินที่เธอเก็บหอมรอมริบมาตลอดชีวิต ไปลงทุนเพื่อให้ผลิดอกออกผลให้เธอได้นำมาใช้ในบั้นปลายชีวิตที่เหลืออยู่ของเธอ

ขณะที่ผู้เชี่ยวชาญทางการเงินและนักวิเคราะห์จากบริษัทหลักทรัพย์มองว่า ในกรณีที่เลวร้ายที่สุดหากไม่สามารถชำระหนี้ได้ มีความเป็นไปได้ที่ บมจ.สตาร์ค อาจจะขอยื่นต่อศาลล้มละลายกลาง เพื่อทำแผนฟื้นฟูกิจการ ซึ่งอาจจะต้องใช้ระยะเวลาในการดำเนินการมากกว่าระยะเวลาไถ่ถอน

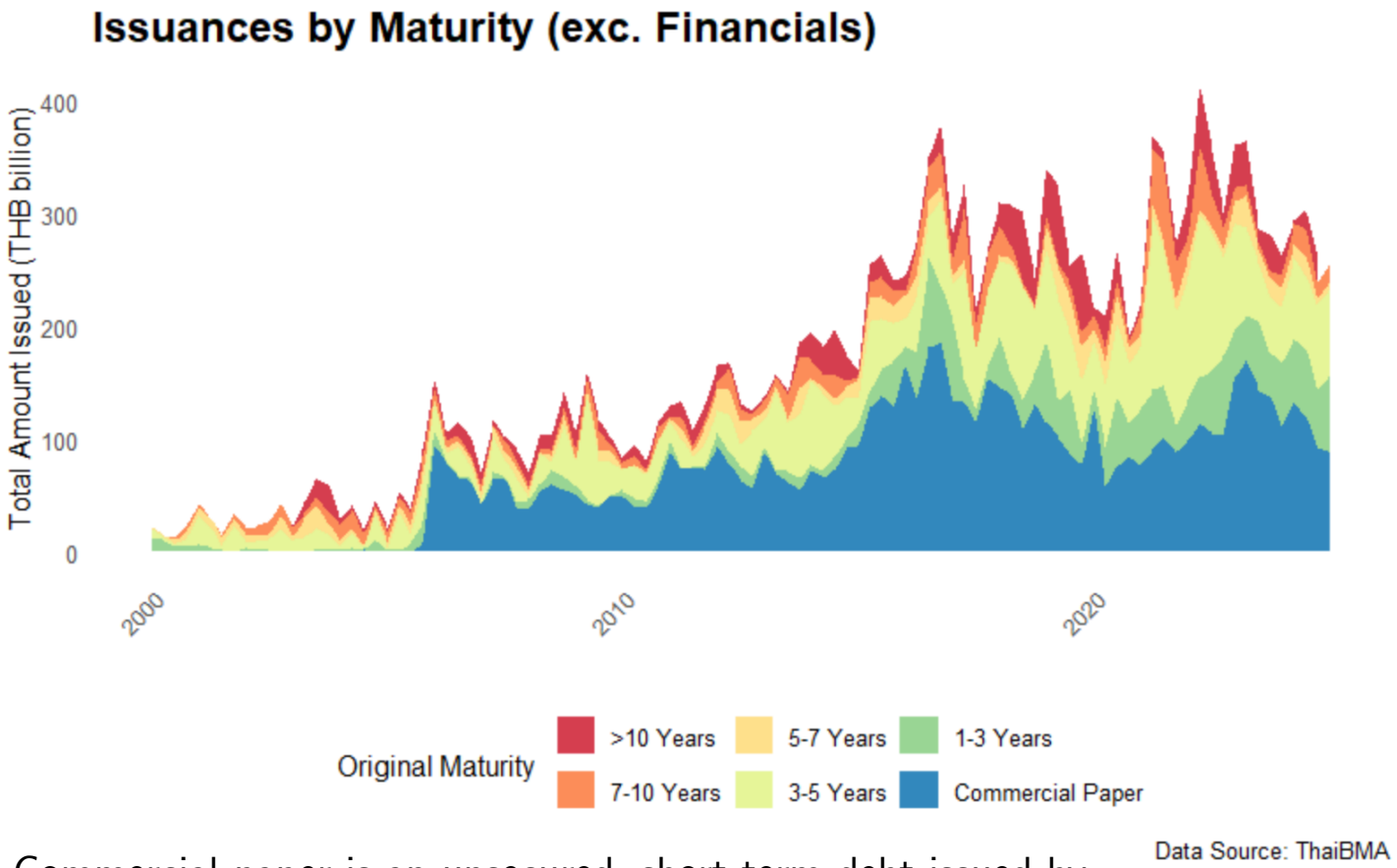
"ที่ตัดสินใจซื้อหุ้นกู้ ดิฉันไม่ได้พิจารณาเรื่องผลตอบแทนอย่างเดียว เพราะจริง ๆ แล้วดอกเบี้ยที่ได้ไม่สูงมากเกินไป และที่มองคือต้องการถือครองไม่ยาวมากนักไม่เกินสองปี แต่เน้นในเรื่องความน่าเชื่อถือของบริษัท เรตติ้งดี ๆ เพราะตอนนี้อายุดิฉันก็มากแล้ว 80 ปีแล้ว"

เธอตัดสินใจใช้เงินเก็บ 2 ล้านบาท ไปซื้อหุ้นกู้สองรุ่น คือ STARK242A และ STARK254A พร้อม ๆ กับพี่สาวของเธอสองคนที่มีอายุไล่เลี่ยกัน 82 ปี และ 84 ปี คนละ 2 ล้านบาท ทำให้ทุกวันนี้เธอต้องอาศัยยานอนหลับเพื่อทำให้เธอข่มตาหลับได้

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Mismatches in corporate debt structure?

Reliance on short-term commercial papers (CPs) by non-financial firms.



Commercial paper is an unsecured, short-term debt issued by a corporation, usually with maturity of less than 270 days.

- The rise in the use of short-term, unsecured debt has been documented in the U.S. by Custodio et al. (2013), Colla et al. (2013, 2020), Benmelech et al. (2020, 2025).
- This dependence on short-term debt by non-financial firms inherently creates (1) **duration/maturity mismatches** and (2) **rollover risk**.
- **Q1: What does the debt composition look like for listed Thai corporates?**
- **Q2: How does that influence their investment decisions?**

** This research is supported by PIER Research Grant 2023.*

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Preview of Key Findings

- **CP as a 'Gateway' to Higher Leverage**
  - Firms increase leverage following CP issuance, not just by substituting bank loans, but via net new borrowing.

- **Short-Term Debt for Long-Term Investment**
  - Firms use CP proceeds to fund CapEx and working capital.
  - → Leveraging rollovers (positive net CP issuance) are associated with higher CapEx and NWC growth.

- **Mutual Fund Demand Matters**
  - Firms whose CP is held more by money market mutual funds tend to invest more.
  - → Early evidence that 'soft' monitoring encourages financial mismatches.

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Q1. Debt Composition and Debt Clusters

Adapted from Colla, Ippolito, and Li (2013), who can identify 7 types of debt.

Data source: ThaiBMA (from 1993) and SETSMART (from 1996),
matched and manually screened for discrepancies, subsidiaries, mergers, and acquisitions

Final sample period: 2001Q1 to 2024Q4, aggregated to firm-quarter level

Exclude financial firms (I-SECTOR 2, 11, 16, 66) and property funds (I-SECTOR 33)

Five types of debt, calculated as shares.

- CP (commercial papers)
- STB (bonds with 1-3 years TTM)
- LTB (bonds with more than 3 years TTM)
- PERP (perpetual bonds)
- OTH (other interest-bearing debt).

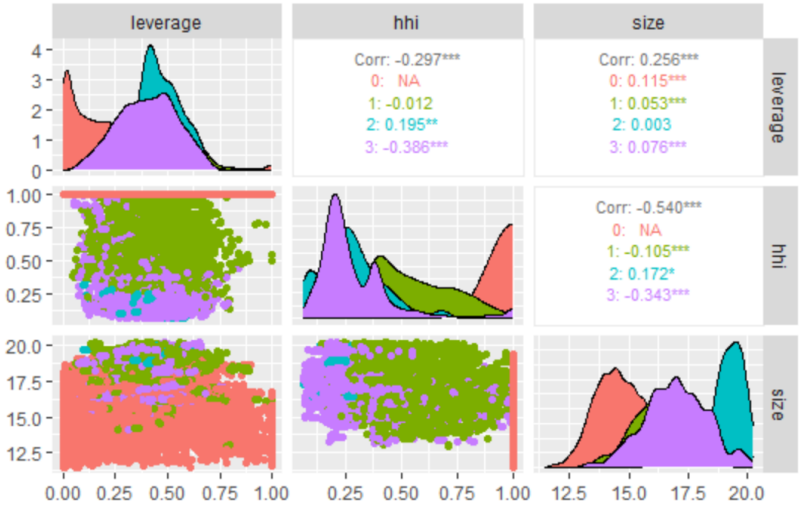
Normalized HHI to (between 0 and 1) to measure debt concentration (and specialization).

$$HHI_{i,t} = \frac{SS_{i,t} - 1/5}{1 - 1/5}$$

$$SS_{i,t} = \left(\frac{CP_{i,t}}{TD_{i,t}}\right)^2 + \left(\frac{STB_{i,t}}{TD_{i,t}}\right)^2 + \left(\frac{LTB_{i,t}}{TD_{i,t}}\right)^2 + \left(\frac{PERP_{i,t}}{TD_{i,t}}\right)^2 + \left(\frac{OTH_{i,t}}{TD_{i,t}}\right)^2$$

Three clusters are identified using K-means clustering.

Firms without capital market debt put in a separate cluster.



Cluster	Firms	Num Obs	Leverage	Size	HHI
Non-Issuer	848	35,029	25.4%	14.81	1.0000
Bank and CP	276	4,766	42.5%	16.96	0.5269
Perp Issuer	12	202	45.3%	18.60	0.2793
Bond Issuer	163	3,371	40.4%	16.98	0.2977

Cluster	Non-Rated	CP	ST Bonds	LT Bonds	Perpetual	Others
Non-Issuer	100.00%	0.0%	0.0%	0.0%	0.0%	100.0%
Bank and CP	57.57%	5.5%	9.9%	11.6%	0.1%	72.9%
Perp Issuer	18.32%	0.1%	13.2%	25.5%	11.9%	49.3%
Bond Issuer	45.89%	3.6%	32.6%	33.0%	0.1%	30.9%

- Firms with capital market debt has more debt. Consistent with Faulkender and Petersen (2006).
- Firms that issuer perpetual bonds tend to be larger (cluster 2).
- Firms with greater variety of capital market debt does not seem to have higher leverage.

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Next, we use multivariate regressions to look at leverage.

We use propensity score to match issuers to non-issuers based on tobins'q, size, roa, and leverage to reduce the selection bias. Winsorized at 1% and 99%.

FULL SAMPLE

Num Obs	43,370	Firms	884
		Issuer	293
Panel A		CP Issuer	185

Variable	Mean	Std Dev	5th pct	Median	95th pct
Leverage	28.5%	24.8%	0.2%	26.1%	64.6%
Investment	0.5%	3.8%	-2.4%	0.0%	5.8%
NWC growth	0.3%	5.1%	-7.2%	0.1%	8.4%

Panel B

Variable	Mean	Std Dev	5th pct	Median	95th pct
Non-rated	90.8%	29.0%	0.0%	100.0%	100.0%
CP Issuer	5.7%	23.2%	0.0%	0.0%	100.0%
Over all issuer	19.2%	39.4%	0.0%	0.0%	100.0%
CP issued/total assets	0.3%	1.6%	0.0%	0.0%	0.9%
Bond issued/total assets	0.3%	2.0%	0.0%	0.0%	0.0%
Net CP issued/total assets	0.0%	1.0%	0.0%	0.0%	0.0%
Net bond issued/total assets	0.1%	2.0%	0.0%	0.0%	0.0%
Share CP	0.9%	5.1%	0.0%	0.0%	4.0%
Share bond	7.6%	19.4%	0.0%	0.0%	56.2%

Panel C

Variable	Mean	Std Dev	5th pct	Median	95th pct
Tobin's q	1.32	1.42	0.20	0.94	3.73
Cash flow/total assets	6.2%	10.8%	-12.1%	6.2%	23.7%
Log(size)	15.22	1.56	13.10	14.99	18.20
Return on assets	3.2%	12.0%	-13.9%	3.9%	16.9%
Tangibility	35.6%	23.7%	2.0%	33.5%	78.1%
KZ Index	2.91	2.58	0.35	2.41	7.47
NWC/total assets	20.3%	21.6%	-5.4%	15.6%	64.3%

MATCHED SAMPLE

Num Obs	14,422	Firms	563
		Issuer	266
Panel A		CP Issuer	170

Variable	Mean	Std Dev	5th pct	Median	95th pct
Leverage	36.2%	20.7%	3.1%	36.7%	64.9%
Investment	0.7%	3.7%	-2.3%	0.0%	5.7%
NWC growth	0.3%	4.4%	-6.0%	0.0%	7.2%

Panel B

Variable	Mean	Std Dev	5th pct	Median	95th pct
Non-rated	75.7%	42.9%	0.0%	100.0%	100.0%
CP Issuer	15.0%	35.8%	0.0%	0.0%	100.0%
Over all issuer	50.0%	50.0%	0.0%	50.0%	100.0%
CP issued/total assets	0.7%	2.6%	0.0%	0.0%	4.6%
Bond issued/total assets	0.8%	2.9%	0.0%	0.0%	5.7%
Net CP issued/total assets	0.1%	1.5%	-0.7%	0.0%	1.0%
Net bond issued/total assets	0.3%	2.9%	-1.5%	0.0%	3.9%
Share CP	2.3%	7.9%	0.0%	0.0%	15.4%
Share bond	19.6%	27.0%	0.0%	0.0%	77.2%

Panel C

Variable	Mean	Std Dev	5th pct	Median	95th pct
Tobin's q	1.32	1.27	0.23	0.99	3.46
Cash flow/total assets	5.6%	9.7%	-10.4%	5.6%	21.4%
Log(size)	16.52	1.50	14.10	16.38	19.21
Return on assets	3.5%	8.7%	-8.3%	3.6%	14.8%
Tangibility	35.3%	25.5%	1.0%	33.6%	79.6%
KZ Index	3.21	2.42	0.69	2.70	7.53
NWC/total assets	17.8%	23.2%	-5.5%	9.7%	72.9%

Data source: ThaiBMA and SETSMART.
Date range: 2001 to 2024, aggregated to firm-quarter level.

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Firms in clusters 2 to 4 (issuers) do not appear to have different leverage. However, **CP issuers** tend to have **higher leverage** → further investigation.

VARIABLES	(1) Full	(2) Full	(3) Full	(4) Full	(5) Matched	(6) Matched	(7) Matched	(8) Matched
Debt HHI	-0.107***				-0.043**			
	(-5.955)				(-2.275)			
Bank and CP		-0.068***				-0.018		
		(-4.978)				(-1.154)		
Perp Issuer		0.005				0.013		
		(0.509)				(1.304)		
Bond Issuer		0.016				-0.018		
		(0.906)				(-1.430)		
CP Issuer			0.025***				0.036***	
			(2.735)				(3.849)	
Debt capital market issuer			0.065***				0.016	
			(5.454)				(1.188)	
Share CP				0.090**				0.030
				(2.581)				(0.785)
Share debt capital market				0.066***				-0.012
				(3.191)				(-0.547)
Non-rated	-0.027**	-0.026**	-0.026**	-0.043***	-0.040***	-0.040***	-0.041***	-0.052***
	(-2.487)	(-2.360)	(-2.334)	(-4.004)	(-3.468)	(-3.327)	(-3.300)	(-4.638)
Observations	43,368	43,370	43,370	43,368	14,422	14,422	14,422	14,422
Number of Firms	884	884	884	884	563	563	563	563
Adjusted R-squared	0.196	0.198	0.199	0.192	0.261	0.262	0.265	0.259

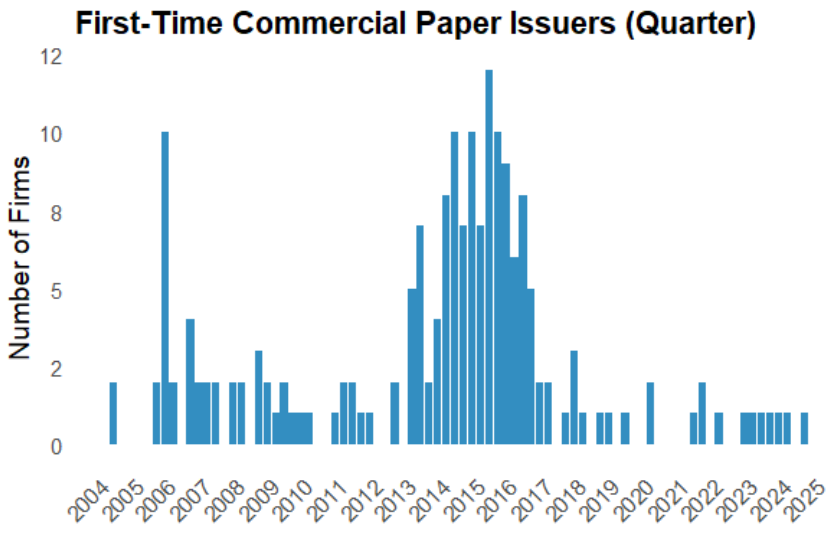
CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

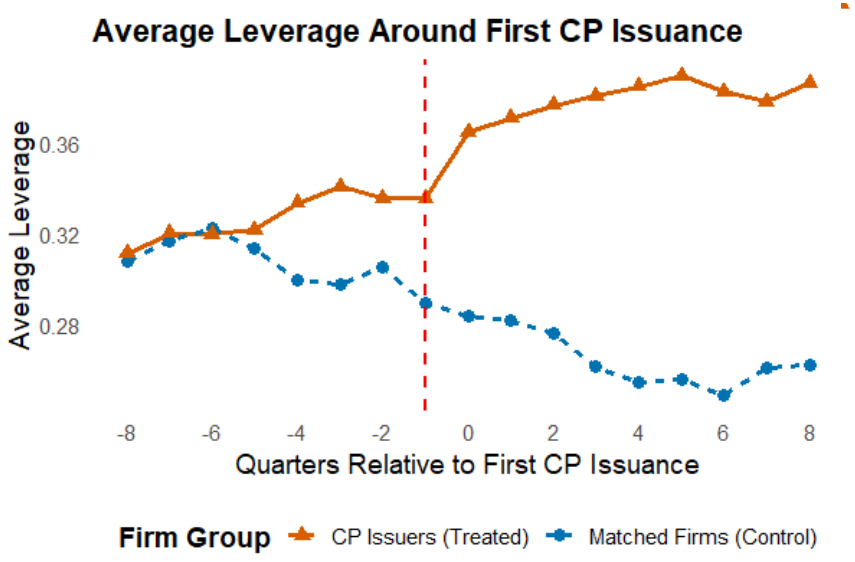
Firms tend to have higher leverage after CP issuances…

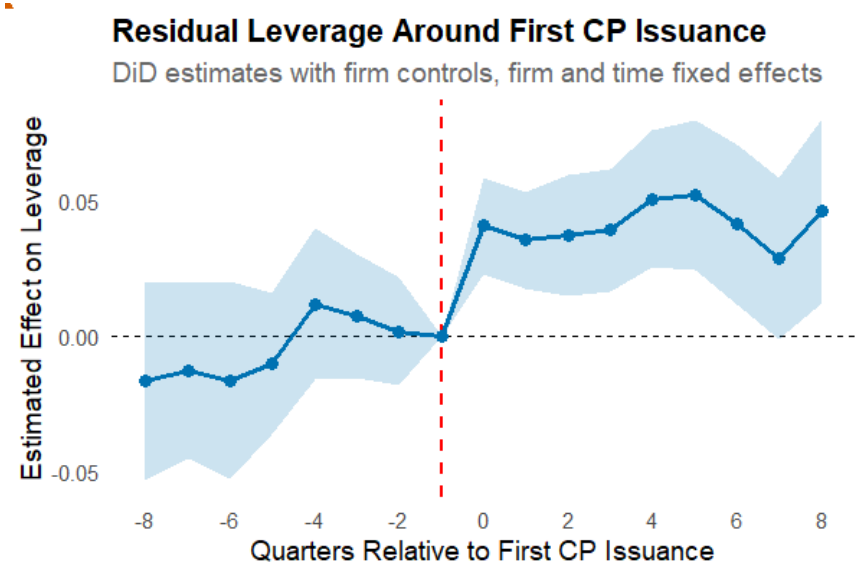
We look at the leverage before and after the *first* CP issuance.

- For each firm, the first date of CP issuance is identified (ThaiBMA data begins in 1993).
- We compute average leverage of issuers and matched non-issuers for 8 quarters, then plot the interactions from the event study "DiD" regression: (treatment not exogenous…)

$$Lev_{it} = Firm_i + Quarter_t + \boldsymbol{\alpha} \cdot Quarter_t \times CPIssuer_i + \beta \cdot LevControls_{it} + \varepsilon_{it}$$



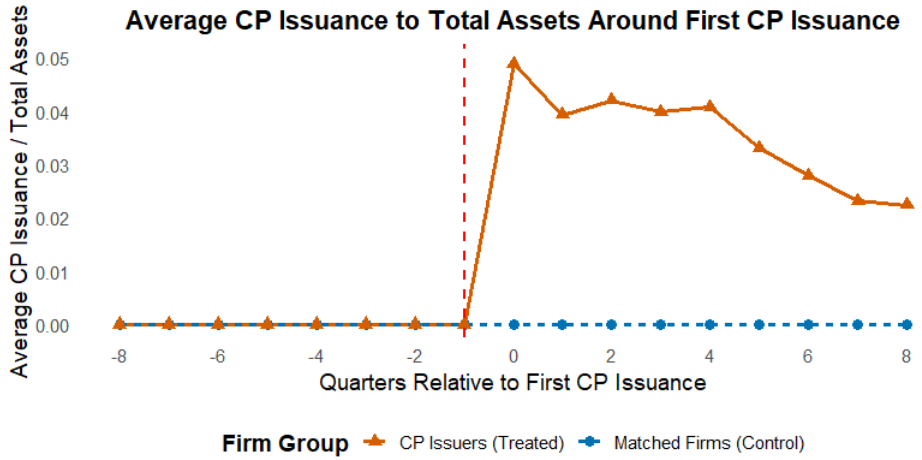


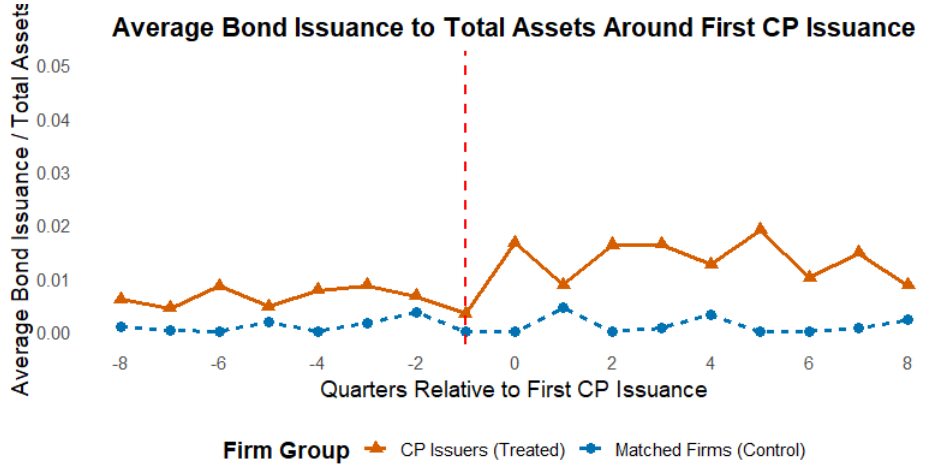


CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

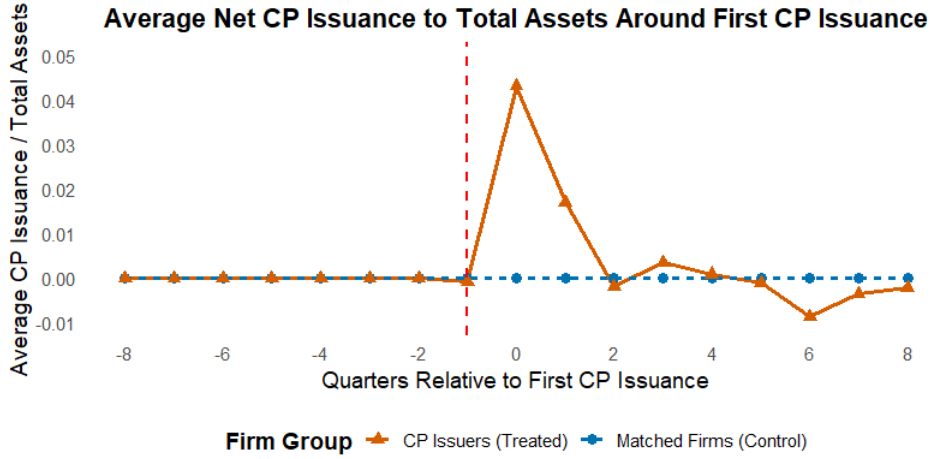
...and the leverage increase is from prolonged positive net issuances of both bonds and CPs. The 'gateway' effect.

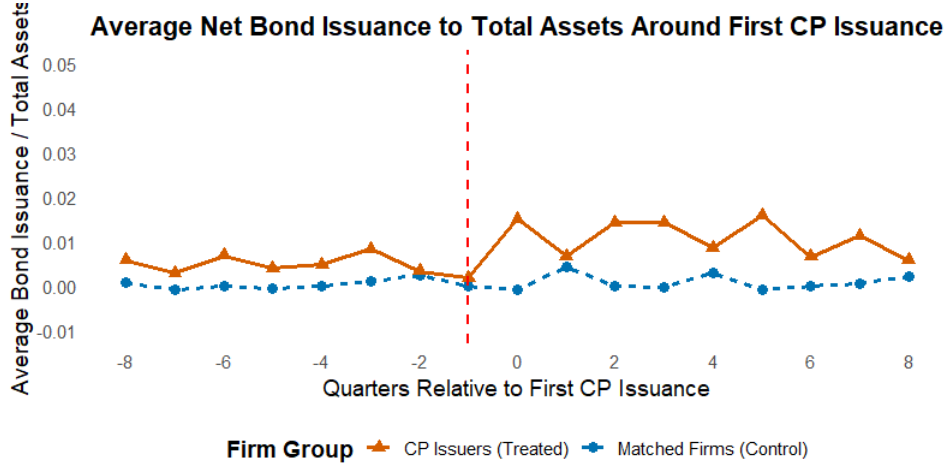
NEW ISSUES





NET ISSUES





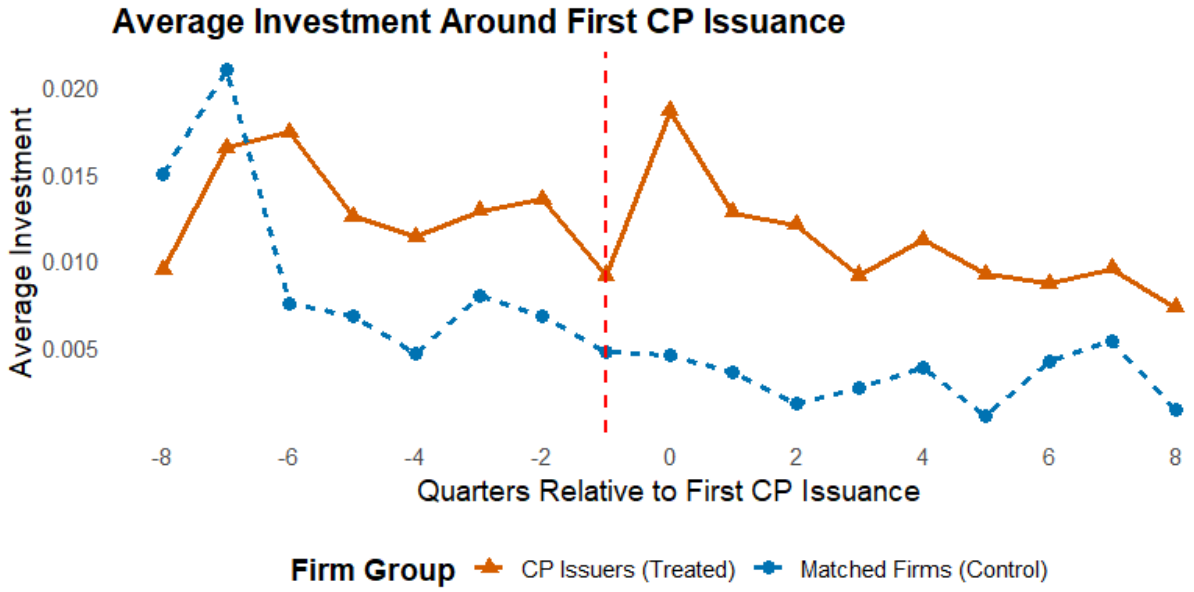
Q2: Debt Composition and Corporate Investment

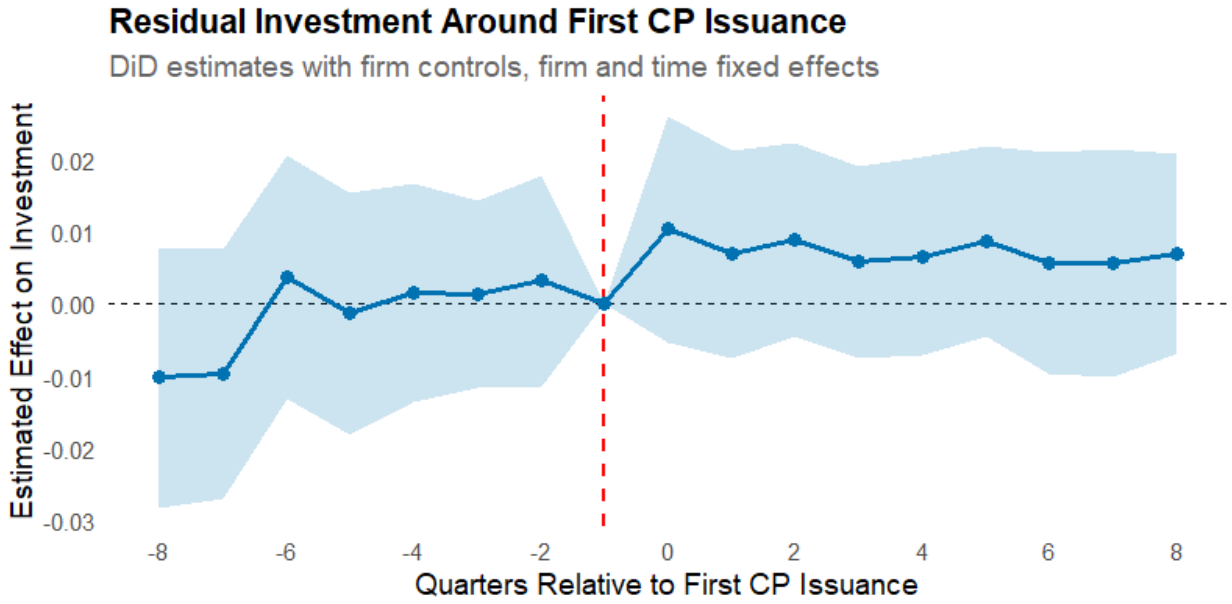
Biguri (2023) finds that firms with more unsecured debt tends to invest more.

- First, we motivate with the same event study residual plot.

$$Inv_{it} = Firm_i + \boldsymbol{\alpha} \cdot Quarter_t \times CPIssuer_i + \beta \cdot InvControls_{it} + \boldsymbol{\varepsilon_{it}}$$

- No evidence that the firm investment (CapEx/total assets) increases after the *first CP issuance*. But what about the longer-term effects?





CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

CP issuers (not just first-time) tend to invest more.

Matching is important because issuers and non-issuers are quite different.

$$Lev_{it} = Firm_i + Quarter_t + \beta \cdot DebtComposition_{it} + \gamma \cdot LevControls_{it} + \varepsilon_{it}$$

VARIABLES	(1) Full	(2) Full	(3) Full	(4) Full	(5) Full	(6) Matched	(7) Matched	(8) Matched	(9) Matched	(10) Matched
Debt HHI	0.001					0.004*				
	(0.385)					(1.698)				
CP Issuer		0.005***					0.005***			
		(3.612)					(3.687)			
Debt capital market issuer		-0.001					-0.003*			
		(-0.717)					(-1.940)			
Share CP			0.022***					0.021***		
			(3.270)					(2.881)		
Share debt capital market			-0.005*					-0.009***		
			(-1.904)					(-2.959)		
CP issued/total assets				0.083***					0.085***	
				(3.923)					(3.930)	
Bond issued/total assets				0.040***					0.049***	
				(2.818)					(3.109)	
Net CP issued/total assets					0.042					0.081***
					(1.227)					(3.214)
Net bond issued/total assets					0.038***					0.045***
					(2.765)					(2.809)
Observations	43,368	43,370	43,368	43,370	43,370	22,921	22,921	22,921	22,921	22,921
Number of Firms	884	884	884	884	884	707	707	707	707	707
Adjusted R-squared	0.036	0.036	0.037	0.037	0.036	0.039	0.040	0.041	0.042	0.040

Asset-liability matching in corporate finance.

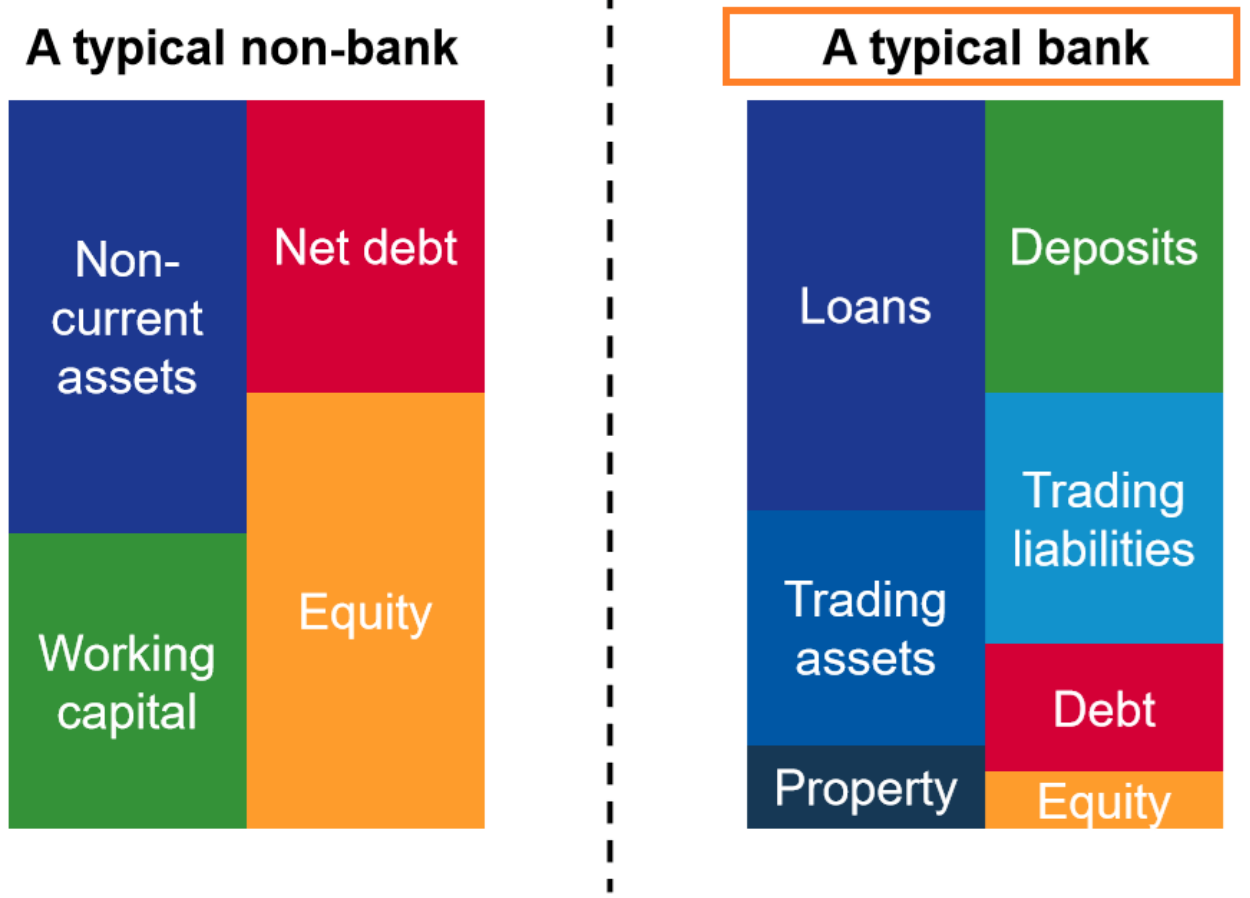
The same principle as in financial intermediaries. Rollover risk = bank run.

(Net) working capital typical (NWC)
typical financing sources

- Trade credit (accounts payable)
- Bank credit lines or revolvers
- **Commercial paper (CP)**
- Short-term bank loans or factoring
- Retained earnings / internal cash

Capital expenditure (CapEx)
typical financing sources

- Term loans
- **Corporate bonds or debentures**
- Leases (e.g., for equipment)
- Equity
- Project finance
- Retained earnings / internal cash



Source: Corporate Finance Institute

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Short-term debt for long-term investment?

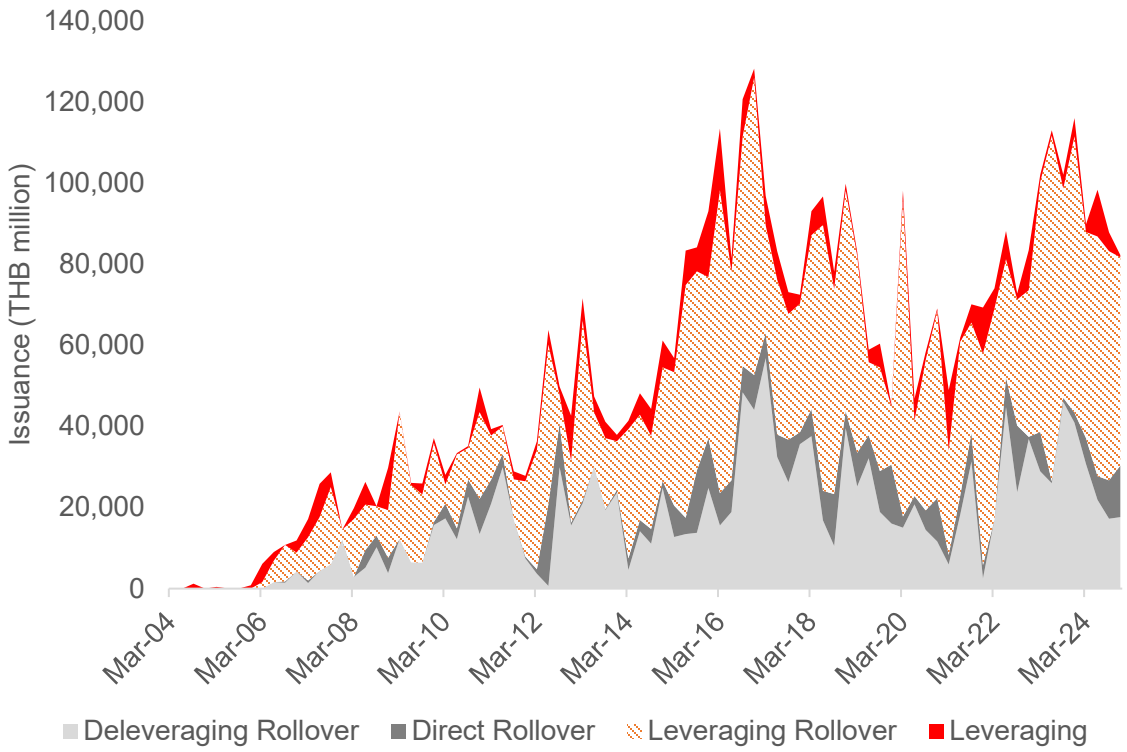
We look at ST (increase in NWC) and LT (CapEx) investments separately.
CP issuers tend to increase NWC more (but they also increase CapEx as well).

$$Inv_{it} = Firm_i + Quarter_t + \beta \cdot DebtIssuance_{it} + \gamma \cdot InvControls_{it} + \varepsilon_{it}$$

VARIABLES	(1) CapEx	(2) CapEx	(3) CapEx	(4) CapEx	(5) NWC	(6) NWC	(7) NWC	(8) NWC
CP Issuer	0.005***				0.005***			
	(3.687)				(2.926)			
Debt capital market issuer	-0.003*				-0.000			
	(-1.940)				(-0.018)			
Share CP		0.021***				-0.000		
		(2.881)				(-0.020)		
Share debt capital market		-0.009***				-0.005		
		(-2.959)				(-1.629)		
CP issued/total assets			0.085***				0.072**	
			(3.930)				(2.563)	
Bond issued/total assets			0.049***				0.003	
			(3.109)				(0.233)	
Net CP issued/total assets				0.081***				0.179***
				(3.214)				(3.929)
Net bond issued/total assets				0.045***				0.024*
				(2.809)				(1.878)
Observations	22,921	22,921	22,921	22,921	22,921	22,921	22,921	22,921
Number of Firms	707	707	707	707	707	707	707	707
Adjusted R-squared	0.040	0.041	0.042	0.040	0.053	0.053	0.053	0.055

ST debt for LT investment + LT use of ST debt?

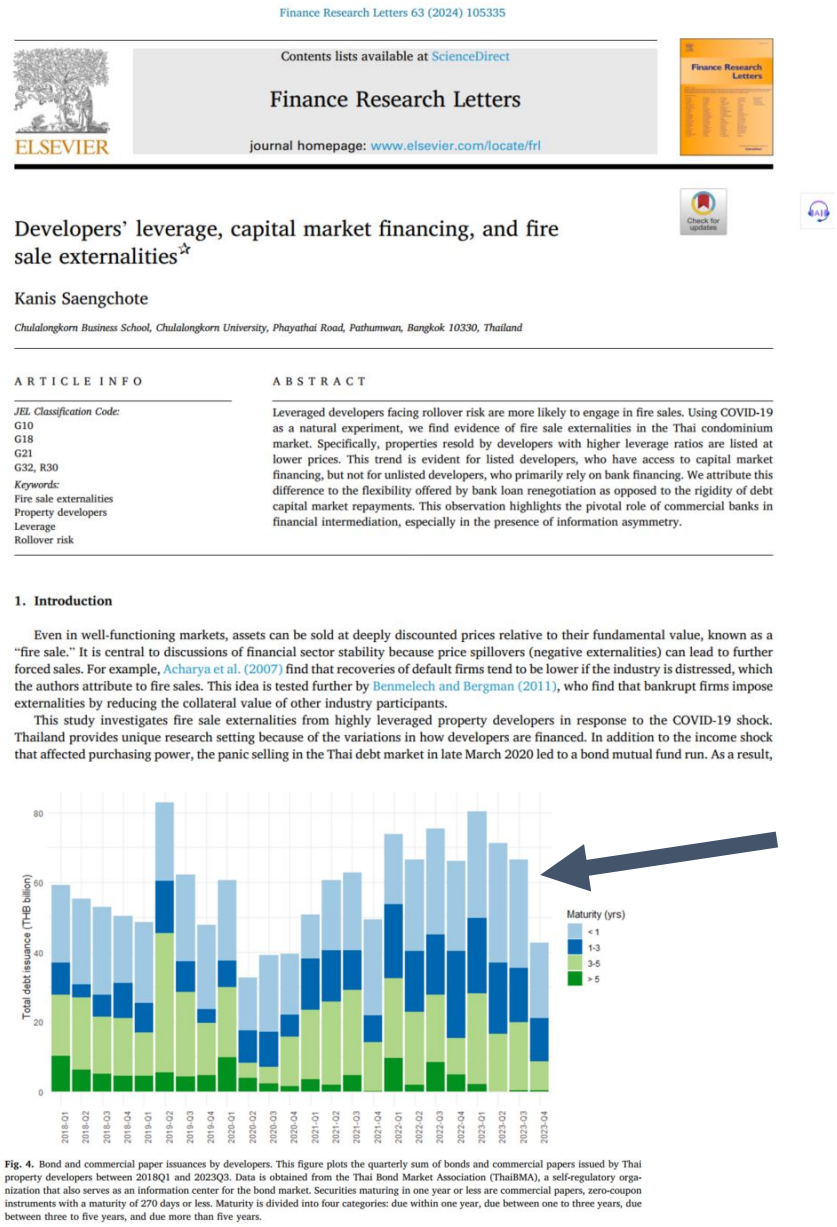
Around 90% of CP issuances are for rollovers, and they are funding investments.



- Direct rollover (zero net issuance) – indicator
- Deleveraging (negative net issuance) – indicator x …
- Leveraging (positive net issuance) – indicator x …

- Firms that directly rollover (around 12% of issuer-quarter invest more (CapEx, not NOWC).
- Leveraging issuances increase NWC *and CapEx*.
- Deleveraging issuances reduce NWC, *not CapEx*. Asymmetrical.

VARIABLES	(1) CapEx	(2) NWC
Direct rollover [zero net issuance]	0.004**	-0.001
	(2.412)	(-0.474)
Leveraging net issuance/total assets	0.144***	0.165***
	(3.735)	(2.691)
Deleveraging net issuance/total assets	-0.025	0.214***
	(-0.688)	(3.406)
Net bond issued/total assets	0.039**	0.023*
	(2.441)	(1.726)
Observations	14,422	14,422
Number of Firms	563	563
Adjusted R-squared	0.047	0.065
Controls	YES	YES
Firm FE	YES	YES
Quarter FE	YES	YES



Finance Research Letters 63 (2024) 105335

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Developers' leverage, capital market financing, and fire sale externalities☆

Kanis Saengchote

Chulalongkorn Business School, Chulalongkorn University, Phayathai Road, Pathumwan, Bangkok 10330, Thailand

ARTICLE INFO

JEL Classification Code:
G10
G18
G21
G32, R30
Keywords:
Fire sale externalities
Property developers
Leverage
Rollover risk

ABSTRACT

Leveraged developers facing rollover risk are more likely to engage in fire sales. Using COVID-19 as a natural experiment, we find evidence of fire sale externalities in the Thai condominium market. Specifically, properties resold by developers with higher leverage ratios are listed at lower prices. This trend is evident for listed developers, who have access to capital market financing, but not for unlisted developers, who primarily rely on bank financing. We attribute this difference to the flexibility offered by bank loan renegotiation as opposed to the rigidity of debt capital market repayments. This observation highlights the pivotal role of commercial banks in financial intermediation, especially in the presence of information asymmetry.

1. Introduction

Even in well-functioning markets, assets can be sold at deeply discounted prices relative to their fundamental value, known as a "fire sale." It is central to discussions of financial sector stability because price spillovers (negative externalities) can lead to further forced sales. For example, Acharya et al. (2007) find that recoveries of default firms tend to be lower if the industry is distressed, which the authors attribute to fire sales. This idea is tested further by Benmelech and Bergman (2011), who find that bankrupt firms impose externalities by reducing the collateral value of other industry participants.

This study investigates fire sale externalities from highly leveraged property developers in response to the COVID-19 shock. Thailand provides unique research setting because of the variations in how developers are financed. In addition to the income shock that affected purchasing power, the panic selling in the Thai debt market in late March 2020 led to a bond mutual fund run. As a result,

Fig. 4. Bond and commercial paper issuances by developers. This figure plots the quarterly sum of bonds and commercial papers issued by Thai property developers between 2018Q1 and 2023Q3. Data is obtained from the Thai Bond Market Association (ThaiBMA), a self-regulatory organization that also serves as an information center for the bond market. Securities maturing in one year or less are commercial papers, zero-coupon instruments with a maturity of 270 days or less. Maturity is divided into four categories: due within one year, due between one to three years, due between three to five years, and due more than five years.

** This research was supported by PIER Research Grant 2020.*

For real estate companies, NWC includes buildings developed for sale.

I-SECTOR 25, 68 and inventory days greater than 365.

Developers also use both bonds and CPs to finance construction of for-sale real estate. DCM financing has weaker monitoring than bank financing.

VARIABLES	(1) Developers	(2) Others
Direct rollover [zero net issuance]	0.005	-0.001
	(1.020)	(-0.345)
Leveraging net issuance/total assets	0.143*	0.193***
	(1.727)	(2.682)
Deleveraging net issuance/total assets	0.186*	0.211***
	(1.797)	(2.888)
Net bond issued/total assets	0.073*	0.007
	(1.944)	(0.569)
Observations	2,643	11,779
Number of Firms	67	496
Adjusted R-squared	0.103	0.078
Controls	YES	YES
Firm FE	YES	YES
Quarter FE	YES	YES

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Roadmap: include ownership data or placement type (PO, II, HNW)

หุ้น

ลุ้น ‘รายใหญ่อสังหาฯ’ คืนหนี้ จับตาความสำเร็จ ‘ขายตราสารหนี้’ หรือ ‘หุ้นกู้’ เพื่อนำเงินมารีไฟแนนซ์

By อัญชลี สบายสุข | sabuysuk@gmail.com | 24 ก.ค. 2025 เวลา 6:00 น.

Monetary Policy and Risk-Taking:
Evidence from Thai Corporate Bond Markets*

Warinthip Worasak Nuwat Nookhwun
Pongpitch Amatyakul†

Bank of Thailand‡
15 August 2022

Abstract

This paper examines the risk-taking channel of monetary policy in the context of Thai corporate bond market. Based on newly-issued non-financial corporate bonds from 2001 to the third quarter of 2020, we find that low interest rates are associated with greater issuance of bonds with worse risk ratings, which is more pronounced for bonds from the property sector. In addition, these bonds tend to have longer maturity. However, we do not find evidence of compression of risk premium or underpricing of risks during these low-rate periods. We then examine whether any types of bond investors are prone to the search-for-yield behaviour. Using the Bank of Thailand's confidential debt securities holding dataset from 2013 onward, our results show that individuals, rather than banks and institutional investors, are the prime holder of high-risk bonds. Conditional on bond risk ratings, only two groups of bondholders appear to bias toward higher-yield bonds. These include individuals and other depository financial institutions, namely saving cooperatives and money market mutual funds. Our results point toward weak evidence of risk-taking among corporate bond investors during the low-rate environment.

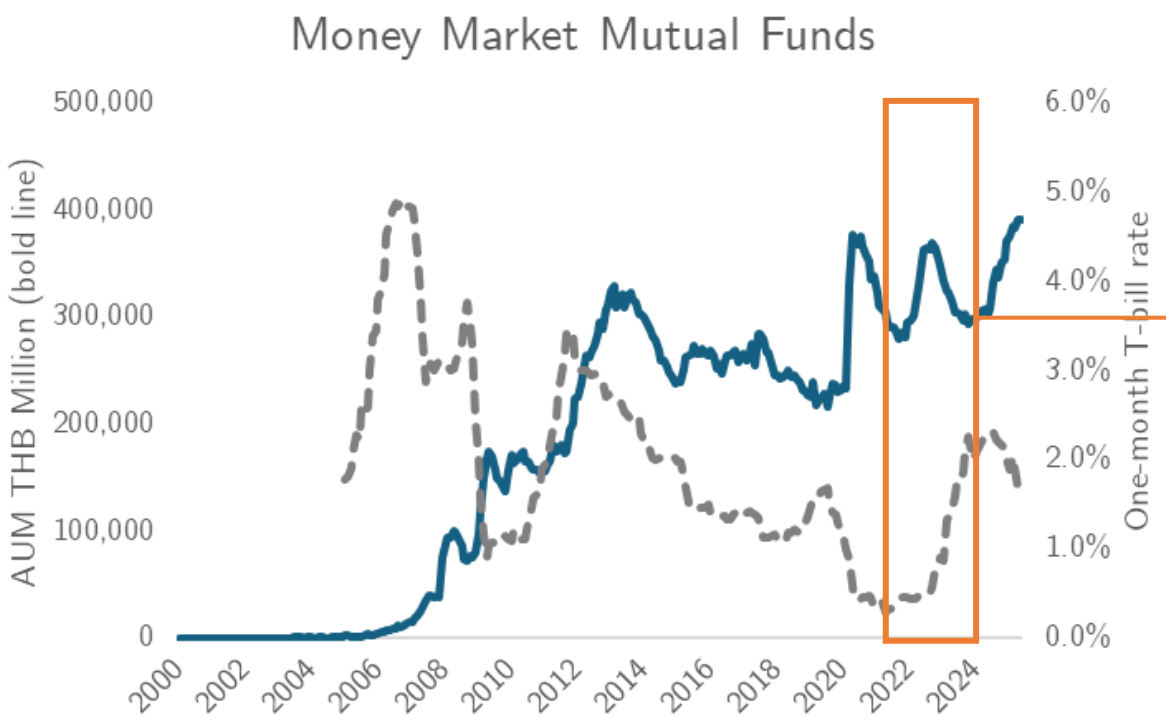
Keywords: monetary policy, interest rate, risk taking, search for yield, corporate bond, underpricing of risk, excess bond premium

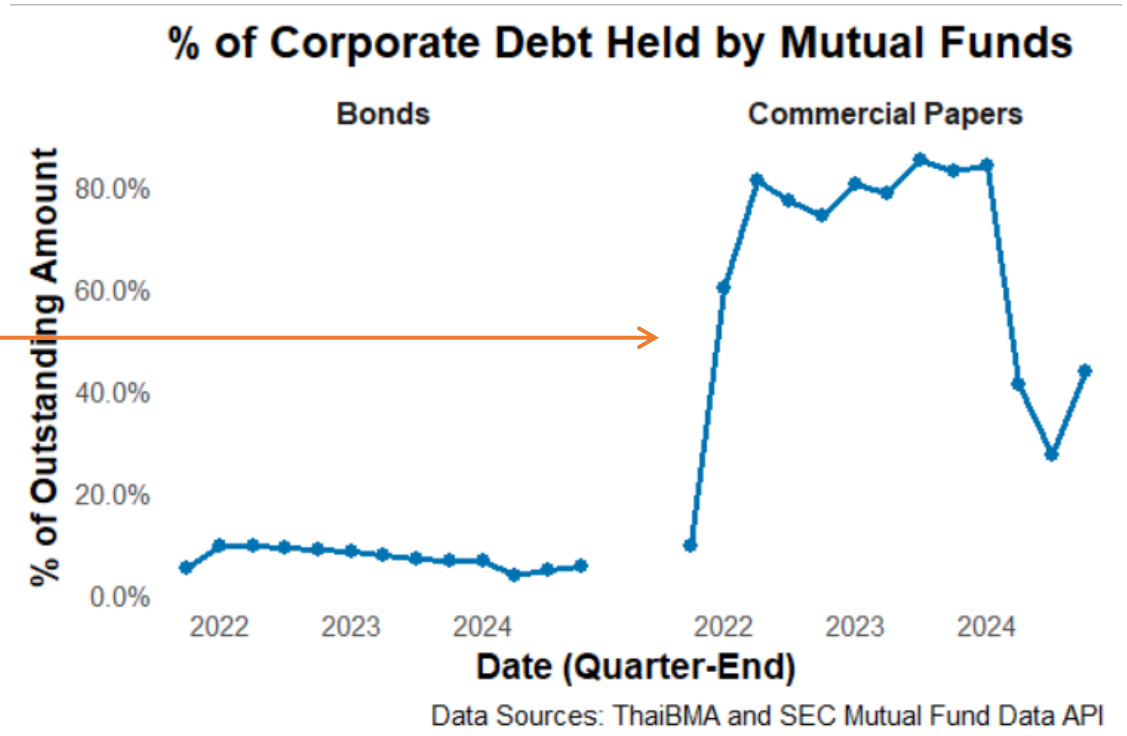
JEL Classifications: E44, E52, G11, G12.

CPs often end up in money market mutual funds.

CP issuances are influenced by MMF demand + MMF 'soft' monitoring.

Limitation: SEC data API only available for 2021Q3 to 2024Q3. We can only cover a small portion of our full sample.





Source: EC˙MB˙004˙S2 : Monetary Aggregates and Components and FM˙RT˙001˙S2 : Interest Rates in Financial Market

Smoother for bonds, more variation for CPs.

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

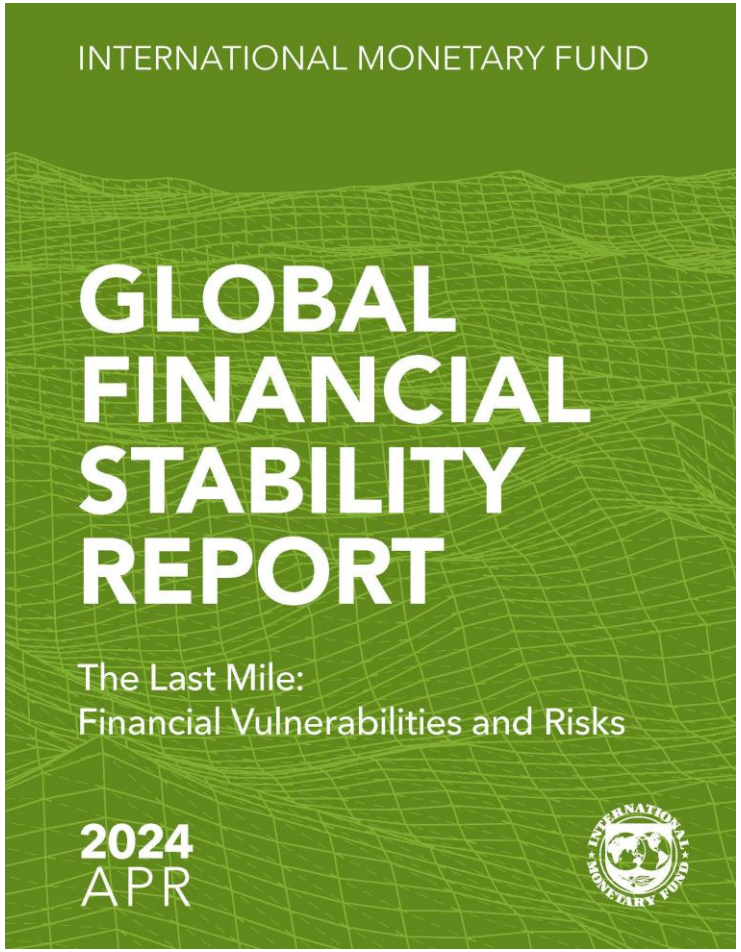
There is some evidence that demand from MMF can influence corporate investment. MMFs as 'shadow banks.'

VARIABLES	(1) CapEx	(2) CapEx	(3) NWC	(4) NWC
Share CP held by funds		0.005*		0.009**
		(1.790)		(1.992)
Share bond held by funds		-0.000		-0.002
		(-0.005)		(-0.445)
Net CP issued/total assets	0.104	0.067	0.332	0.219*
	(1.615)	(1.077)	(1.334)	(1.743)
Net bond issued/total assets	0.007	0.006	0.077	0.061***
	(0.328)	(0.276)	(1.436)	(2.950)
Observations	3,166	3,166	892	3,166
Number of Firms	380	380	97	380
Adjusted R-squared	0.036	0.036	0.061	0.138
Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES

- However, our sample has been reduced to 2021Q3 to 2024Q3 due to SEC API data limitation.
- Roadmap: extend fund ownership data and perhaps use MMF net inflow as an instrument for share of CP held by fund.

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Related research area: shadow banking and the transmission of monetary shock.
E.g., Pozsar et al. (2010), Chernenko and Sunderam (2014), Xiao (2020).
Risk taking can be exacerbated by reaching for yield (can also happen in MMFs) in low-rate environment (La Spada, 2018).



Chapter 2 at a Glance

- The chapter assesses vulnerabilities and potential risks to financial stability in corporate private credit, a rapidly growing asset class—traditionally focused on providing loans to midsize firms outside the realms of either commercial banks or public debt markets—that now rivals other major credit markets in size.
- Private credit creates significant economic benefits by providing long-term financing to firms too large or risky for banks and too small for public markets. However, credit migrating from regulated banks and relatively transparent public markets to the more opaque world of private credit creates potential risks.
- Firms borrowing private credit tend to be smaller and riskier than their public market counterparts, and the sector has never experienced a severe economic downturn at its current size and scope. Such an adverse scenario could see a delayed realization of losses followed by a spike in defaults and large valuation markdowns.
- The chapter identifies vulnerabilities arising from relatively fragile borrowers, increased exposure of pensions and insurers to the asset class, a growing share of semiliquid investment vehicles, multiple layers of leverage, stale valuations, and unclear interconnections between participants.
- Assessing overall financial stability risks of this asset class is challenging because the data needed to fully analyze these risks are unavailable. Despite these limitations, such risks appear contained at present.
- However, given private credit's size and role in credit creation—now large enough to compete directly with public markets—it may become macro-critical and amplify negative shocks to the economy.
- The rapid growth of private credit, coupled with increasing competition from banks on large deals and pressure to deploy capital, may lead to a deterioration in pricing and nonpricing terms, including lower underwriting standards and weakened covenants, raising the risk of credit losses in the future.
- If the asset class remains opaque and continues to grow exponentially under limited prudential oversight, the vulnerabilities of the private credit industry could become systemic.

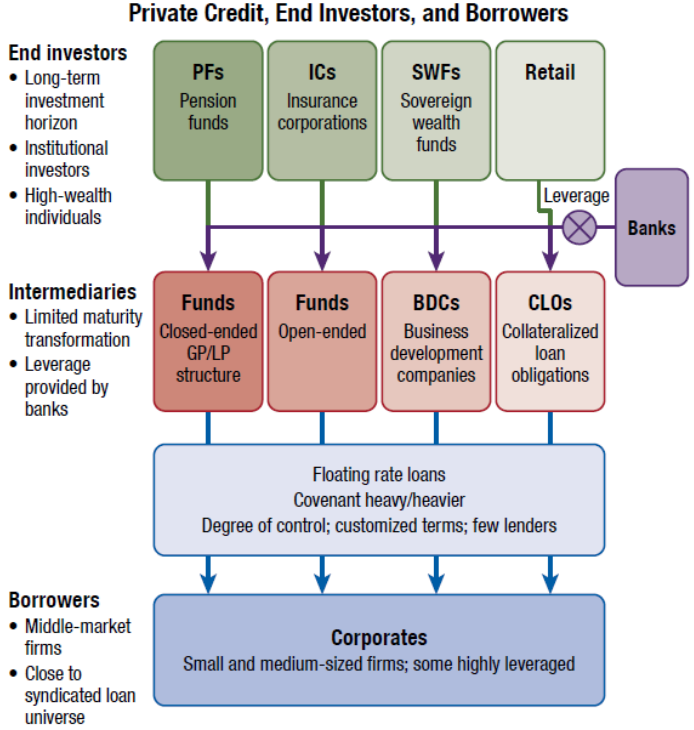
Policy Recommendations

- Encourage authorities to consider a more intrusive supervisory and regulatory approach to private credit funds, their institutional investors, and leverage providers.
- Close data gaps so that supervisors and regulators may more comprehensively assess risks, including leverage, interconnectedness, and the buildup of investor concentration. Enhance reporting requirements for private credit funds and their investors, and leverage providers to allow for improved monitoring and risk management.
- Closely monitor and address liquidity and conduct risks in funds—especially retail—that may be faced with higher redemption risks. Implement relevant product design and liquidity management recommendations from the Financial Stability Board and the International Organization of Securities Commissions.
- Strengthen cross-sectoral and cross-border regulatory cooperation and make asset risk assessments more consistent across financial sectors.

* private credit funds and BDCs perform more monitoring than MMFs

Figure 2.1. Private Credit Structure

Private credit funds are intermediaries between end investors and corporate borrowers that offer floating rate loans to middle-market firms.



Source: IMF staff.
Note: GP = general partners; LP = limited partners.

CHULALONGKORN BUSINESS SCHOOL
FLAGSHIP FOR LIFE

Key Takeaways & Implications

- **CP Use Reflects Financial Mismatches**
  - Thai listed firms increasingly rely on short-term debt (CP) to fund long-term investment, prone to asset-liability mismatches seen in banks.
  - Over 90% of CP issuance is rollover but leveraging rollovers are strongly associated with higher CapEx and NWC growth.
- **Capital Market Access Raises Leverage**
  - CP issuance adds to total leverage. Matched-sample and event study analyses show firms become structurally more indebted after entering CP markets.
  - This supports a "gateway" effect of capital market funding.
- **Mutual Fund Involvement May Weaken Discipline**
  - Preliminary evidence: firms whose CP is more heavily held by mutual funds invest more, even after controlling for fundamentals.
  - The suggests soft monitoring, especially from money market funds, may encourage procyclical and possibly inefficient investment.

CHULALONGKORN
BUSINESS SCHOOL
FLAGSHIP FOR LIFE

THANK YOU!