

What Drives Global Syndication of Bank Loans? Effect of Capital Regulations

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Syndicate Loan Markets: Banks are Global Players

- ▶ 59% of syndicated loans are issued globally (i.e., with one or more participant banks outside lead lender's country)
- ▶ Participation in global syndicated loans varies by country

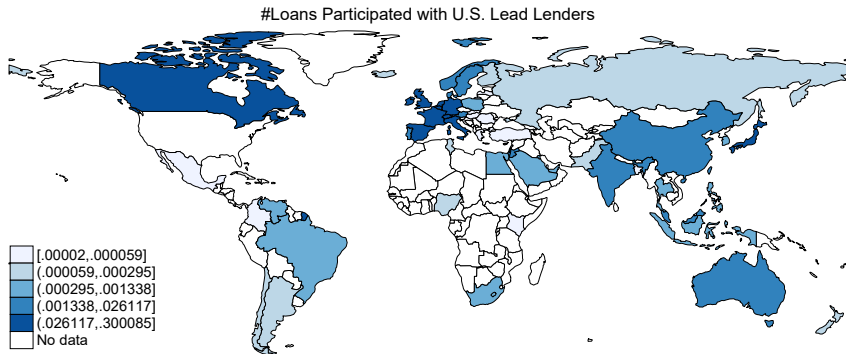
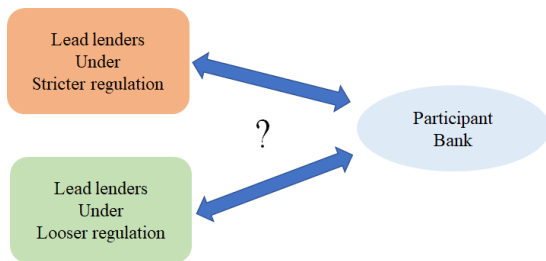


Figure 2. Participation of Foreign Banks in U.S. Syndicated loans

Regulatory Differences and Global Syndications

- ▶ What incentives drive banks to form such syndicate structure?
- ▶ We examine the role of cross-country differences in capital regulations
 - ▶ Regulatory stringency directly affects individual banks' risk tolerance and lending capacity
 - ▶ Capital regulation and its implementation vary widely across countries
- ▶ Can banks exploit regulatory differences by partnering with foreign banks who have different risk appetite?



Regulatory Differences and Global Syndications

Cross-country differences in capital regulations have conflicting implications on syndication structure

▶ Regulatory Arbitrage

- ▶ Banks circumvent strict regulations in home countries by acquiring subsidiaries and investing in loosely regulated countries [Barth et al. (2004), Houston, Lin, and Ma (2012), Karolyi and Taboada (2015)]

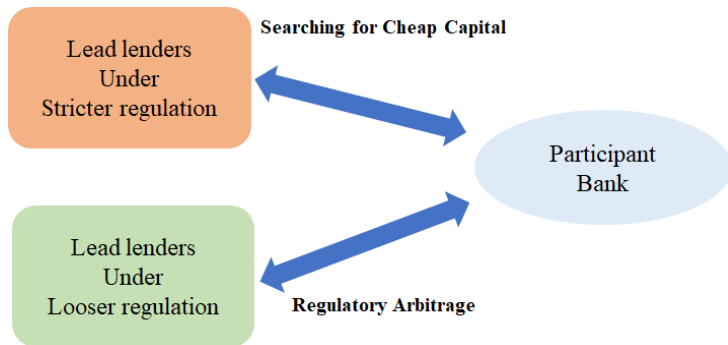
⇒ Prediction: Banks participate in loan syndicates with lead arrangers under *looser* regulation

▶ Alternatively Searching for Cheap Capital

- ▶ As capital stringency increases banks' cost of capital, lead arrangers want cheaper capital from banks in less regulated countries [Kashyap, Stein, and Hanson (2010), Baker and Wurgler (2015)]

⇒ Prediction: Banks participate in loan syndicates with lead arrangers under *stricter* regulation

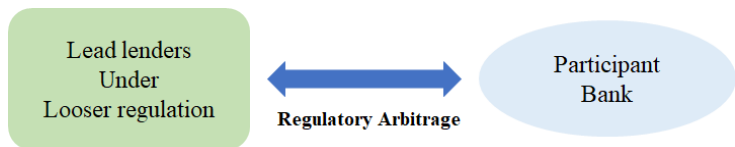
Regulatory Differences and Global Syndications



This Paper

How does cross-country differences in capital stringency affect the pairing between participant and lead banks?

- ▶ Examine the syndicate formation by banks from 44 countries
- ▶ Results consistent with predictions of **Regulatory Arbitrage**: Strictly regulated banks seek to circumvent capital regulation by participating in loans led by loosely regulated banks



This Paper

Does regulation-driven syndication generate economic consequences for borrowers and lenders?

- ▶ Focus on globally syndicated loans extended to U.S. firms
- ▶ Participants from strictly regulated countries tend to select borrowers that are smaller, unrated, and have less tangible assets
- ▶ Those loans also have higher spreads and higher default likelihood
- ▶ Risky borrowers experience greater growth in investment, employment, and sales

Regulatory Arbitrage

- ▶ Regulators face higher information asymmetry in assessing the risk level of foreign loans
 - ▶ Under Basel Accords, the calculation of risk-weighted assets only depends on broad risk categories; Banks have discretion to report lower credit risks within categories [Begley, Purnanandam, and Zheng (2017), Plosser and Santos (2017)]
 - ▶ Our findings: Effects are weaker for banks with sufficient capital reserves, countries with high quality of law enforcement, and banks with high-quality accounting
- ▶ Why syndicate instead of direct lending? Banks can rely on a loosely-regulated lead arranger who has expertise to prospect, screen, and monitor
 - ▶ Reduce adverse selection in a pool of high-risk borrowers
 - ▶ Participants can thus access high-yield loans outside home country

Data

- ▶ Syndicated loans issued in 44 countries 1995-2016 from Dealscan
 - ▶ Countries with ≥ 5 banks and ≥ 100 average loans issued per year
 - ▶ 114,992 loans initiated by 1,108 lead banks and participated by 3,487 banks
- ▶ Data sources:
 - ▶ Bank regulations: Barth, Caprio, and Levine (2013)
 - ▶ Country-level macro indices: World Bank
 - ▶ Bank characteristics: Bankscope
- ▶ Identify regulations based on the locations of ultimate parents
 - ▶ Bank merger information from SDC and NIC

Summary Statistics by Country

Country	Capital Stringency	#Loans	Loan Amount (\$US Bil)	%Globally Syndicated Loans	% Total Value Contributed by Foreign Banks
Australia	6.3	2,030	753.1	89.9	27.2
Brazil	3.0	614	198.1	89.3	27.1
Canada	2.8	5,101	2,297.4	82.4	35.7
China	4.0	2,507	272.3	44.6	20.2
France	4.5	1,803	1,323.0	92.7	32.5
Germany	5.3	1,309	1,247.8	94.8	32.2
Hong Kong	4.7	1,539	203.9	97.4	14.3
India	4.5	1,519	138.8	31.6	13.8
Italy	3.1	784	541.6	91.1	24.4
Japan	3.0	22,644	219.0	23.1	30.4
Netherlands	4.5	680	568.1	99.2	32.4
Singapore	6.0	625	214.5	98.7	22.8
South Korea	4.0	1,407	161.5	67.0	21.0
Spain	6.0	921	668.6	89.8	23.5
Sweden	2.0	297	157.5	99.1	27.4
United Kingdom	5.3	2,517	2,414.1	97.3	20.7
USA	4.8	58,366	27,313.9	67.4	34.9

Variables: Syndication Activities

Syndication activities measures:

$$\begin{aligned} \text{Syndicate}_{i,j,t} &= \max_{k \in K_{i,t}} 1_{i,j,k} \\ \% \text{Syndicate}_{i,j,t} &= \frac{\sum_{k \in K_{i,t}} 1_{i,j,k}}{\sum_{j \in B} \sum_{k \in K_{i,t}} 1_{i,j,k}} \end{aligned}$$

- ▶ i a lead bank; j a participant bank; t a year
- ▶ k a syndicated loan deal
- ▶ $K_{i,t}$ the collection of syndicated loans initiated by the lead bank i in year t including both domestically and globally syndicated loans
- ▶ B the collection of potential participant banks
- ▶ **Bank-pair-year panel sample:** 865,087 observations of 64,259 bank pairs

Baseline Analyses

Dependent Var:	<i>Syndicate</i>		<i>%Syndicate</i>	
	(1)	(2)	(3)	(4)
Δ <i>Capital Stringency</i> (Part–Lead)	0.005*** (2.99)	0.005*** (2.59)	0.027 (1.54)	0.051*** (3.02)
Δ <i>GDP per Capita</i> (Part–Lead)	0.018 (1.49)	0.011 (0.98)	0.066 (0.47)	0.072 (0.58)
Δ <i>GDP Growth</i> (Part–Lead)	0.121*** (2.60)	0.137*** (2.89)	-0.461 (-0.69)	0.108 (0.17)
<i>Log(Distance)</i>	-0.024*** (-10.89)	-0.061*** (-22.42)	-0.471*** (-11.23)	-0.688*** (-17.18)
<i>Common Language</i>	0.005 (0.53)	0.021** (2.03)	0.176 (1.55)	0.135 (1.25)
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	Yes	No
Lead, Participant Bank FE	No	Yes	No	Yes
Observations	766,686	766,439	766,686	766,439
Adjusted R^2	0.0596	0.226	0.0332	0.149

Regulatory Arbitrage: Seeking Risks?

- ▶ Do strictly regulated banks actually invest in “risky” loans through global syndication?
 - ▶ U.S. loan-level sample: 28,494 loan packages
 - ▶ Compare across loans syndicated by **strictly regulated** participants to those with **loosely regulated** participants

- ▶ Borrower base: strictly regulated banks lend to riskier borrowers

Participant Capital Regulation	Strict	Loose	Difference (Strict – Loose)
<i>Borrower Size</i>	6.952	7.418	-0.467***
<i>Borrower Tangibility</i>	0.321	0.337	-0.016***
<i>Borrower Rating</i>	0.352	0.437	-0.085***

Loan Spreads and Performance

- ▶ Strictly-regulated banks participate in loans that have higher spreads, but worse performance
- ▶ Consistent with regulatory arbitrage incentives

Dependent Var:	<i>Loan Spread</i>	<i>Loan Default</i>
<i>Lead Stringency</i>	2.528 (0.63)	0.020 (0.69)
<i>Participant Stringency</i>	1.297*** (3.86)	0.011** (2.49)
Firm Chars & Loan Chars	Yes	Yes
Borrower Industry FE	Yes	Yes
Year FE	Yes	Yes
Lead Country FE	Yes	Yes
Observations	25,288	25,198
Adjusted R^2	0.496	0.0934

Access to Credit and Corporate Policies

- ▶ We examine the real effects of regulatory arbitrage on borrowers
 - ▶ Look at how firms' investment, employment, and sales respond to capital stringency of foreign participant lenders

Dep. Var.:	(1) <i>Investment</i>	(2) <i>Employment</i>	(3) <i>Log(Sales)</i>
<i>Participant Stringency</i>	0.006** (1.98)	0.065* (1.95)	0.046** (2.18)
Borrower Char	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Observations	18,589	18,262	18,657
Adjusted R^2	0.75	0.98	0.99

Access to Credit and Corporate Policies

- ▶ The effect of regulatory arbitrage incentives of participant lenders are concentrated on risky borrowers (unrated or speculative grade)

Dep. Var.:	<i>Investment</i>	<i>Employment</i>	<i>Sales</i>
<i>Participant Stringency</i>	0.006** (2.15)	0.020 (0.55)	-0.002 (-0.08)
<i>High Risk</i>	-0.005 (-1.23)	-0.156*** (-2.82)	-0.172*** (-4.51)
<i>Participant Stringency</i> × <i>High Risk</i>	-0.000 (-0.52)	0.027** (2.46)	0.029*** (3.79)
Borrower Char	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Observations	18,589	18,262	18,657
Adjusted R^2	0.75	0.98	0.99

Additional Analyses

- ▶ Controlling for borrowers' time-varying conditions [Details](#)
- ▶ Cross-sectional analyses [Details](#)
- ▶ Instrumental-variable estimation [Details](#)
- ▶ Event study of IRB adoption
- ▶ Competing hypothesis
- ▶ Other robustness [Details](#)

[Conclude](#)

Controlling for Borrower Conditions

- Results could be driven by unobservable, time-varying borrower conditions (e.g., credit demand, investment opportunities, etc.)

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Dep. Var.: <i>Participate</i>	(1)	(2)	(3)	(4)
<i>Capital Stringency</i>	0.004*** (32.32)	0.001*** (5.18)	0.004*** (32.74)	0.001*** (5.92)
<i>GDP Growth</i>		-0.003*** (-54.21)		-0.003*** (-53.22)
<i>GDP per Capita</i>		1.110*** (71.68)		1.094*** (71.25)
<i>Log(Distance)</i>		-0.033*** (-51.63)		-0.035*** (-53.12)
<i>Common Language</i>		0.035*** (56.81)		0.036*** (56.81)
<i>Borrower × Year FE</i>	Yes	Yes	Yes	Yes
<i>Lead Country × Year FE</i>	No	No	Yes	Yes
Observations	1,972,105	1,968,742	1,972,016	1,968,654
Adjusted R^2	0.08	0.11	0.08	0.11

Cross-sectional Test

- ▶ We explore bank or country characteristics that could alter the regulatory arbitrage incentives, and thus banks' participation in global syndicates
 - ▶ **Capital adequacy**
 - ▶ Banks with sufficient capital are less likely to engage in regulatory arbitrage
 - ▶ **Quality of legal institution** (country-level)
 - ▶ Higher quality of governance can inhibit regulatory arbitrage
 - ▶ Measure: Worldwide Governance Indicators [Kaufmann et al. (2011)]
 - ▶ **Accounting quality** of the banking system (country-level):
 - ▶ Standardized, transparent accounting reduces regulatory arbitrage, likely because it reduces information asymmetry with regulators
 - ▶ Measure: Survey-based index on the informativeness of bank accounting [Barth et al. (2013)]

Addressing Concerns of Reverse Causality

- ▶ Concern: Global syndication can influence the differences in capital regulations across countries
- ▶ We alleviate this concern using an IV-based estimation, selecting instruments that have been shown to predict banking regulation [Houston, Lin, and Ma (2012); Karolyi and Toboaba (2015)]
 - ▶ Latitude
 - ▶ Ethnic fractionalization
 - ▶ Income inequality
 - ▶ The percentage of years that a country has been independent since 1776
 - ▶ An indicator for whether the central bank is the only supervisor in a given country.

Results from IV Estimation

- IV-base estimation suggests that strict regulation leads banks to participate in global syndication originated by less regulated banks

Dep. Var.:	<i>Syndicate</i>		<i>%Syndicate</i>	
	(1)	(2)	(3)	(4)
$\Delta \widehat{Capital\ Stringency}$	0.019*** (2.79)	0.020** (2.49)	0.085 (1.31)	0.120* (1.79)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	Yes	No
Lead, Participant Bank FE	No	Yes	No	Yes
Hansen's <i>J</i> -statistics (<i>p</i> -value)	0.93	0.97	0.24	0.92
<i>F</i> -statistics (<i>p</i> -value)	< 0.01	< 0.01	< 0.01	< 0.01
Observations	514,363	514,155	514,363	514,155
Adjusted R^2	0.06	0.24	0.03	0.14

Additional Analyses

- ▶ Controlling for borrower conditions
- ▶ Cross-sectional analyses
- ▶ Instrumental-variable estimation
- ▶ Event study of IRB adoption
 - ▶ We perform an event study to reflect the exact timing of bank regulation changes
- ▶ Competing hypotheses
 - ▶ Lead banks' choice? Not supported by data
- ▶ Other robustness [Details](#)

Other Robustness

- ▶ Other risk-inducing bank regulations: entry requirement and funding insured
 - ▶ Regulations that induce banks' risk-taking behaviors increase global syndication
- ▶ Leading vs. Participating
- ▶ Controlling for existence of foreign subsidiaries
- ▶ Subset of loans where borrowers and lead banks are located in the same country

Other Bank Regulation Index

Conclusion

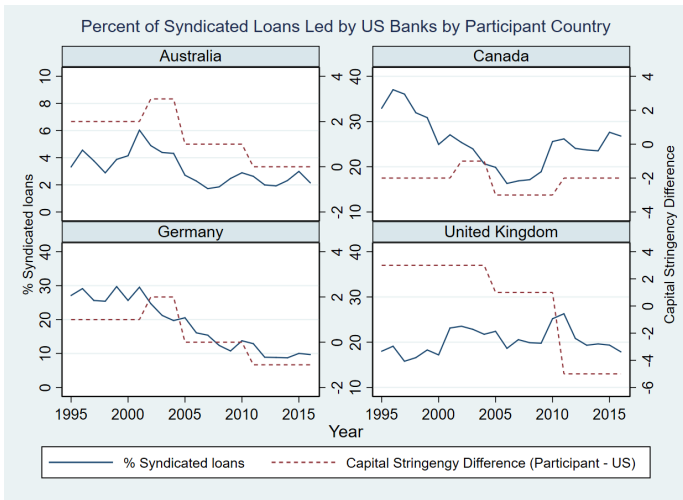
- ▶ The syndicated lending market is highly globalized
- ▶ Our paper documents that cross-country differential in banking regulation is an important determinant of global syndicate formation
 - ▶ Literature on debt contracting takes given the structure of lending syndicates
- ▶ Participation in global syndicates is an alternative, and perhaps a less costly way of conducting regulatory arbitrage
 - ▶ Studies documenting regulatory arbitrage suggests that banks acquire foreign subsidiaries [Karolyi and Toboaba (2015)]; they focus on choice of borrowers and do not consider partnership between banks [e.g., Houston et al. (2012), Ongena et al. (2013)]
- ▶ Our findings shed light on how regulatory arbitrage incentives can affect the access to credit by foreign corporate borrowers

Global Syndication Example

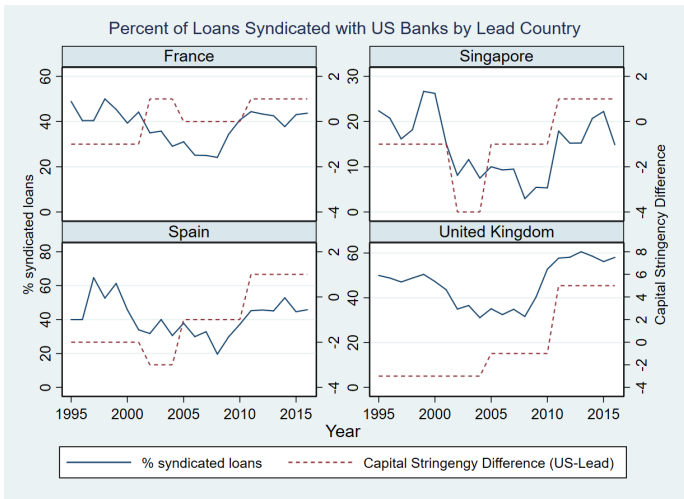
- ▶ In March 2007, Cathay Pacific Airways Ltd received a term loan of 400 million USD led by Hong Kong and Australian banks

Syndicate Members	Country	llocation	Role
Chong Hing Bank	Hong Kong	4.5%	Lead arranger
Westpac Banking Corp	Australia	4.5%	Lead arranger
Malayan Banking Bhd+	Malaysia	6.6%	Senior arranger
Banco Bilbao Vizcaya Argentaria SA+	Spain	6.6%	Senior arranger
Mizuho Financial Group Inc	Japan	20.0%	Coordinating arranger
Sumitomo Mitsui Financial Group Inc	Japan	20.0%	Coordinating arranger
DZ Bank AG+	Germany	11.1%	Coordinating arranger
KBC Group	Belgium	6.6%	Coordinating arranger
BayernLB+	Germany	6.6%	Coordinating arranger
Mega Financial Holding Co Ltd^	Taiwan	6.6%	Coordinating arranger
Banca Monte dei Paschi di Siena SpA+	Italy	2.3%	Arranger
Hua Nan Financial Holdings Co Ltd+	Taiwan	2.3%	Arranger
Intesa Sanpaolo SpA^	Italy	2.3%	Arranger

Country-level Results: US Led Loans



Country-level Results: Foreign Loans Participated by US



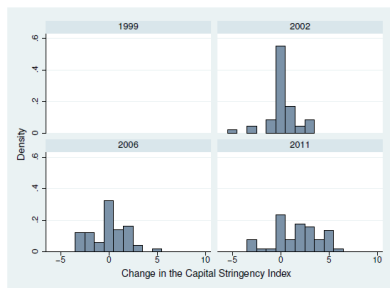
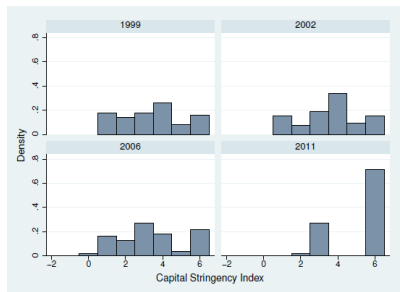
Capital Stringency

Capital Stringency Questions	Australia	USA	Japan	Sweden
1. What is the minimum capital to asset ratio requirement?	8%	8%	8%	8%
2. Does the minimum ratio vary as a function of an individual bank's credit risk?	Yes	Yes	No	No
3. Does the minimum ratio vary as a function of market risk?	n/a	Yes	No	Yes
4. Before minimum capital adequacy is determined, which of the following are deducted from the book value of capital?				
A. Market value of loan losses not realized in accounting books?	n/a	No	No	No
B. Unrealized losses in securities portfolios?	Yes	Yes	Yes	No
C. Unrealized foreign exchange losses	Yes	No	Yes	No
5. What fraction of revaluation gains is allowed as part of capital?	45%	45% Tier 2	45%	Tier 2

Capital Stringency

Despite of efforts to standardize bank regulations globally, how those regulations are actually implemented in each country varies

- ▶ Actual risk-adjusted capital ratio
 - ▶ Using 1988 Basel Accord definitions, as of year-end 2005, China 4.91%, US 12.33%, Singapore 15.8%, Italy 10.6%



Risk-inducing Bank Regulations

1. *Entry Requirement*: the level of legal procedures to obtain a banking license
 - ▶ **Higher** value implies **lower** competition and **less** incentive to take risks (e.g., Ruckes (2004))
2. *Funding Insured*: the percentage of assets funded with insured deposit license
 - ▶ **Higher** value implies moral hazard and **more** incentive to take risks (e.g., Laeven (2002))

Risk-inducing Bank Regulations

Regulation:	<i>Entry Requirement</i>		<i>Funding Insured</i>	
	Syndicate	%Syndicate	Syndicate	%Syndicate
Dependent Var:	(1)	(2)	(3)	(4)
Δ Regulation	-0.004* (-1.90)	-0.135*** (-4.52)	0.034** (2.18)	0.584*** (3.33)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Bank FE	Yes	Yes	Yes	Yes
Observations	864,837	864,837	203,827	203,827
Adjusted R^2	0.218	0.144	0.265	0.136

- ▶ Regulations that induce banks' risk-taking behaviors increase global syndication

Entry Requirement

- ▶ Which of the following are legally required to be submitted before issuance of the banking license?
 - ▶ Draft bylaws
 - ▶ Intended organization chart
 - ▶ Financial projections for first three years
 - ▶ Financial information on main potential shareholders
 - ▶ Background/experience of future directors, etc
- ▶ More restrictions on bank entry that limit competitions make incumbent banks syndicate domestically

Funding Insured

- ▶ What percent of the commercial banking system's assets is funded with insured deposits?
- ▶ Generous deposit insurance distorts incentives to monitor banks' activities
- ▶ In a country with generous deposit insurance, moral hazard problems are intensified and banks can take excess risks

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