Financial Innovation via Sustainable Lending

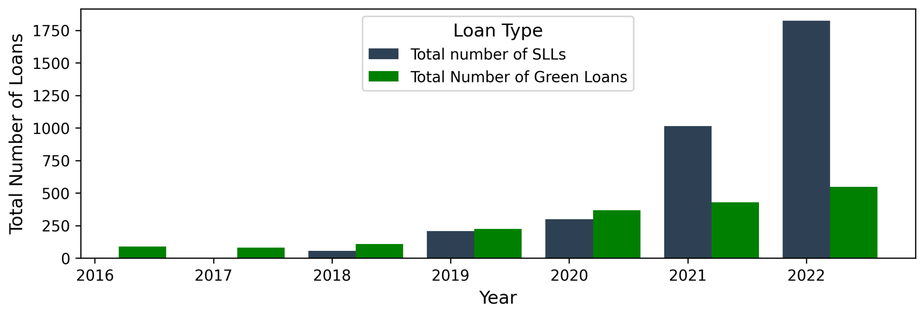
Anya Kleymenova [1] Xi Li [2] Yinan Li [2]

[1]Board of Governors of the Federal Reserve System [2]London School of Economics and Political Science

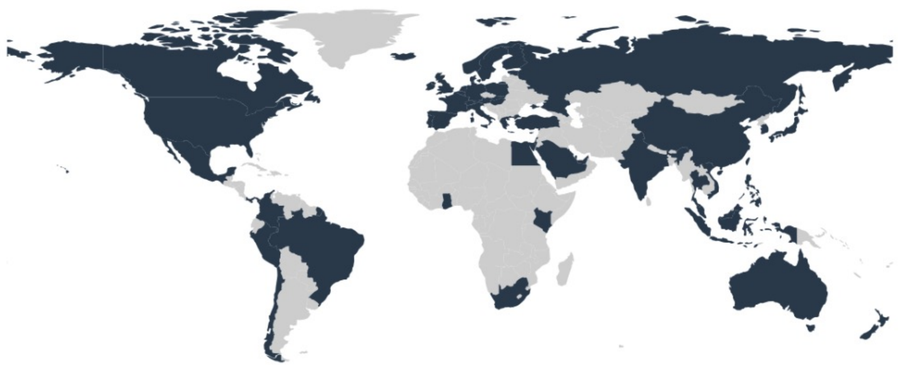
Introduction

We examine the incentives driving banks to introduce **Sustainability-Linked Loans (SLLs)** as an innovative financial product. By analyzing a comprehensive dataset of banks leading these deals, we find that multinational banks, especially the top players in the global syn- dicated markets, are more likely to offer SLLs than domestically-focused banks. Although multinational banks are more likely to offer SLLs in their home markets, their international expansion strategies favor markets already familiar with SLL products and with higher con- centration. Furthermore, banks prefer credit markets where they assume leading positions and have larger economic exposures. Additionally, sustainability reporting requirements and prior involvement in SLLs encourage banks to lead future SLL deals. Leading an SLL trans- action, particularly by assuming a significant role as a sustainability agent, enhances a bank's market share in the local syndicated loan market. However, this advantage is primarily en- joyed by multinational banks operating in international markets. Our findings highlight the strategic motivations behind banks' introduction of SLL products, aiming to strengthen their competitive position in global syndicated markets.

SLLs and Green Loans over Years



Countries with SLLs



Research objectives

The present study investigates the following objectives:

- **Objective 1:** To understand banks' incentives for issuing SLLs
- **Objective 2:** To provide evidence on the consequences of banks participating in the SLL market

SLL Example

CMS Energy Corporation (Utilities, United States)

	Traditional Syndicated Loan	Sustainability-linked Loan
Issue date	27-May-15	5-Jun-18
Loan amount	$550 million	$550 million
Lead arrangers	Barclays Bank PLC, JPMorgan Chase Bank, MUFG Union Bank, Mizuho Bank, Merrill Lynch, Pierce, Fenner & Smith Incorporated, Bank of America,	Barclays Bank PLC, JPMorgan Chase Bank, MUFG Union Bank, Mizuho Bank, Merrill Lynch, Pierce, Fenner & Smith Incorporated, Bank of America
Sustainability Agent	None	Barclays Bank PLC
Financial Covenants	Debt/EBITDA >=6.0	Debt/EBITDA >=6.25 until Dec 31. 2021 then 6.0
	Revolving	Revolving
Performance Pricing	None	None
Sustainability Adjustment		Yes

Details of sustainability adjustments to margins:

- Sustainability Percentage >= Baseline AND: Sustainability Amount > 105% of Baseline Sustainability Amount, margin reduced by 0.025% Sustainability Amount > 110% of Baseline Sustainability Amount, margin reduced by 0.05%
- Sustainability Percentage < Baseline AND:
  Sustainability Amount <= 95% of Baseline Sustainability Amount, margin increased by 0.025%
  Sustainability Amount <= 90% of Baseline Sustainability Amount, margin increased by 0.05%

"Sustainability Amount" refers to the total renewable energy generation and supply by the Company and its subsidiaries, expressed in gigawatt hours (GWh) for a specified period.

Data and Sample

- Data Sources:
  - Refinitiv LoanConnector DealScan
  - Thomson Refinitiv
  - FR Y-14Q
  - Call Reports
- Sample Characteristics:
  - Sample period: 2016–2022
  - 1,238 distinct SLLs
  - 13,078 bank-country-year observations

Bank	Bank home country	Total number of SLL led	Total volume of SLL led ($ billions)	Total number of times acted as sustainability agent	Total number of non-ESG loans led	Total volume of non-ESG loans led ($ billions)	Number of foreign countries led SLL	Number of foreign SLL led
BNP Paribas SA	France	1019	81.514	134	9889	840.253	42	801
Credit Agricole Corporate & Investment Bank SA	France	768	53.553	182	6305	406.787	37	492
BofA Securities	United States	632	87.818	117	18523	2722.654	32	338
HSBC Banking Group	United Kingdom	627	56.921	112	7012	643.713	42	552
ING Group	Netherlands	624	44.792	126	5907	352.626	37	544
Societe Generale SA	France	587	42.526	38	5194	365.546	36	412
Mizuho Financial Group Inc	Japan	550	51.374	34	4969	638.954	40	463
JP Morgan	United States	539	70.773	79	16756	2611.320	31	287
Sumitomo Mitsui Financial Group Inc	Japan	532	44.512	85	4384	420.564	41	484
Banco Santander SA	Spain	500	38.539	102	4482	245.880	27	254

Research Design and Results

Determinants Results

	Full Sample	Full Sample
	(1)	(2)
prior_sll_exp	0.169***	0.138***
	(0.020)	(0.022)
prior_green_loan_exp	0.061***	-0.013
	(0.014)	(0.017)
rel_per	0.034***	0.004
	(0.012)	(0.012)
bank_home_regulation	0.036**	0.005
	(0.014)	(0.045)
country_year_sll_indicator	0.050***	0.049***
	(0.023)	(0.024)
total_hhi	0.476***	0.399***
	(0.141)	(0.137)
loan_leader	0.247***	0.196***
	(0.028)	(0.021)
loan_leader_x_hhi	-0.885***	-0.723***
	(0.149)	(0.129)
exposure	0.024	0.118***
	(0.024)	(0.027)
multinational_foreign	-0.005	-0.037
	(0.024)	(0.025)
multinational_home	0.111***	0.101***
	(0.022)	(0.025)
top_20_foreign	0.055***	-0.016
	(0.017)	(0.037)
top_20_home	0.203***	0.097*
	(0.041)	(0.059)
Observations	13,078	13,078
Bank FE	NO	YES
Country, Year FE	YES	YES
Mean sll_lead_t1	0.214	0.214

- Determinants Design
- $Y_{i,j,t+1} = \alpha + \beta M_{j,t} + \gamma X_{i,j,t} + \eta_j + \delta_{t+1} + \epsilon_{i,j,t+1}$
- $Y_{i,j,t+1}$ = Indicator if bank i leads an SLL in country j in year $t+1$; zero if bank i leads a non-SLL in country j in year $t+1$.
- $M_{j,t}$ = Loan market-level variables lagged by one year, including market concentration (*total_hhi*) and an indicator for any SLLs in country j in year t (*country_year_esg_indicator*).
- $X_{i,j,t}$ = Bank characteristics: size, origin, relationship lending, sustainability experience, ESG regulation, and exposure.
- δ_{t+1} and η_j are *year* and *country* fixed effects.
- Clustered standard errors by country and bank.
- Consequence Design
- $Consequence_{i,j,t+1} = \alpha + \beta M_{j,t} + \gamma X_{i,j,t} + \theta_i + \eta_j + \delta_{t+1} + \epsilon_{i,j,t+1}$
- $Consequence_{i,j,t+1}$ = Bank i market share ($first\_time\_market\_share_{t1}$), capturing new lending, or ($repeat\_borr\_market\_share_{t1}$), capturing relationship lending; similar for non-first-time borrowers switching banks ($switch\_borr\_market\_share$) and portfolio return ($portfolio\_return_{t1}$)
- $M_{j,t}, X_{i,j,t} + \theta_i + \eta_j\ \delta_{t+1}$ are the same as those in determinants model.

Consequences Results

	Full	Full	Full	Multinational Foreign	Multinational Foreign	Multinational Foreign
	first time mkt_shr t1	repeat borr mkt_shr t1	switch borr mkt_shr t1	first time mkt_shr t1	repeat borr mkt_shr t1	switch borr mkt_shr t1
	(1)	(2)	(3)	(4)	(5)	(6)
sll_lead	0.161	0.265***	0.729	0.245	0.277***	0.967
	(0.224)	(0.089)	(0.606)	(0.244)	(0.088)	(0.772)
sll_foreign_lead	0.378*	0.094	0.129	-0.034	0.104	0.125
	(0.226)	(0.102)	(0.537)	(0.239)	(0.112)	(0.539)
sustainability_agent	2.224**	1.074***	1.326	1.992**	0.748***	1.973*
	(0.957)	(0.245)	(0.875)	(0.846)	(0.224)	(1.111)
sustainability_agent_foreign	0.245	-0.076	-1.115	0.109	-0.048	-1.514
	(0.315)	(0.129)	(0.901)	(0.312)	(0.130)	(1.139)
Observations	13,078	13,078	13,078	10,687	10,687	10,687
Bank FE	NO	NO	NO	NO	NO	NO
Country, Year FE	YES	YES	YES	YES	YES	YES
Mean Dependent Variable	1.764	1.030	1.953	1.276	0.977	1.787

Conclusions

- Banks issue Sustainability-Linked Loans (SLLs) to signal a commitment to sustainability and attract socially conscious clients but face costs related to ESG metric complexity and monitoring.
- Expertise in SLLs offers banks a first-mover advantage, enabling international client expansion.
- Large multinational banks with economies of scale and strong local borrower relationships are more likely to offer SLLs, especially in markets where they hold a leading position and significant exposure.
- While local competition discourages SLL issuance, ESG regulations in a bank's home country encourage it.
- Foreign banks improve their market share by leading SLL deals, particularly by attracting new borrowers, enhancing reputation and market presence.
- The study contributes to SLL literature by examining economic incentives for banks to issue SLLs and highlighting cross-market differences in their decisions.

What is already known about this subject?

The literature on financial innovation provides a foundation for understanding banks' incentives to introduce Sustainability-Linked Loans (SLLs). Frame and White (2002) define financial innovation as something that reduces costs, mitigates risks, or enhances services to better meet market demand. Building on this, banks' offering of SLLs can be seen as an effort to cater to the rising demand for sustainable finance. Prior research shows that innovation allows banks to capture new market segments, secure reputational benefits, and potentially increase profitability by charging a premium for sustainability-linked features (e.g., Du et al., 2022; Homanen, 2022). However, the introduction of SLLs also entails costs, especially related to information acquisition and monitoring due to the complex and often opaque nature of ESG metrics (Kim et al., 2022). This challenge aligns with the theoretical insights of Gale and Hellwig (1992) and Thakor (2012), who highlight the unique risks and costs associated with innovative financial products.

What do we add ?

- **Interesting setting** to examine whether banks innovate in sustainable space relevance showing **potential incentives and tradeoffs** for banks to innovate when they enter new markets

 anya.kleymenova@frb.gov