
Capital Inflow Liberalization and Bank Credit Risk

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Motivation

- Domestic stability in the banking system can be threatened by global shocks, through the liberalization of capital inflows
- We explore the effect of de jure capital inflow liberalization on bank credit risk and discuss the mechanism through which this impact happens
- Non-performing loans have impaired banking stability (Partovi and Matousek, 2019) and caused the onset of the 2010-2012 banking crisis (Louzis et al., 2012)
- Emphasizing non-performing loans to manage bank credit risk and maintain financial stability is very important
- However, given data limitations, the literature on non-performing loans is limited (Ari et al., 2021)

Motivation

- Financial liberalization has two main dimensions, domestic financial liberalization and openness to foreign markets
- With capital inflow liberalization, we mean openness to foreign markets
- Some studies (Cubillas and González, 2014; and Tanna et al., 2017) emphasize the role of overall financial liberalization
- However, the overall definition cannot differentiate between changes in the domestic financial system and openness to the international capital markets

Motivation

- The attention is also drawn to international capital inflows
- Dinger and te Kaat (2020) and Giannetti (2007) empirically and theoretically confirm that capital inflows increase loan supply but decrease loan quality
- However, capital inflow is the outcome of capital account openness
- The relaxation of capital controls can weaken financial stability and increase the probability of a financial crisis (Catão and te Kaat, 2021)
- Capital liberalization:
 - Increases individual bank insolvency risk (Cubillas and González, 2014)
 - Poses a threat of a banking crisis (Daniel and Jones, 2007, Giannetti, 2007, Misati and Nyamongo, 2012)
- The presence of foreign banks is an example of global financial openness

Related Literature

- Daniel and Jones (2007) argue that the entry of foreign banks increases the competition in the banking system
- The intense competition decreases the marginal revenue of banking capital and increases banks' risk appetite
- Barajas et al. (2000), based on the experience of Colombia, empirically conclude that foreign banks' entry improves competition and deteriorates loan quality, especially among domestic banks
- Banking crises, which result from financial liberalization, damage bank productivity growth (Tanna et al., 2017)
- However, the studies regarding the impact of capital inflow liberalization on bank risk-taking are rare

Related Literature

- Our study is related to Dinger and te Kaat (2020)
- Dinger and te Kaat (2020) limit their sample to 10 countries from the Euro area and focus on the effect of the de facto measurement of capital account liberalization, which is proxied using cross-border capital inflows
- They do not use non-performing loans or loan loss provisions given data availability
- Thus, we focus on the problem of non-performing loans

Related Literature

- From the “competition-fragility” view on financial liberalization and financial stability (Beck et al., 2013; Jiménez et al., 2013)
- We infer a relation between capital inflow liberalization and bank credit risk
- The increasing competition because of capital inflow liberalization improves bank risk appetite
- First, firms’ financing channels are extended after liberalization
- Foreign banks’ entry eases firms’ financial constraints
- Moreover, firms can get funding from international credit markets (Prati et al., 2012) rather than limit their credit on traditional bank loans

Related Literature

- The domestic stock market responds positively to capital inflow liberalization
- It witnesses an increase in firms' capital returns, especially for financial constrained firms (Ding et al., 2020)
- The competition from international financial markets erodes banks' market power and decreases banks' market share and interest rates on loans
- Banks may lend to risky borrowers, which results in high default risk (Giannetti, 2007)

Related Literature

- Second, capital inflow liberalization leads to low interest rates, and profit losses motivate banks to take on risks
- In other words, liberalization decreases banks' risk aversion
- Catão and te Kaat (2021) show that capital inflow liberalization changes the structure of bank liabilities

The relationship

- Furthermore, we discuss this relationship
- Competition contributes to the positive relationship
- Capital inflow liberalization expands financing channels for firms, who rely heavily on bank credit before liberalization
- By disaggregating the overall liberalization index into sub-categories, we find that the liberalization of financial markets, including bond, money, and financial credit markets that broaden firms' financing channels, has an evident positive impact on bank credit risk
- We divide the sample into high and middle and low economies and show that the middle and low economies drive this positive shock

The relationship

- After capital inflow liberalization, we argue that banks have a lower growth rate in credit and a higher ratio of non-interest income to operating revenues than before
- This finding suggests that the increased competition caused by capital account liberalization impairs banks' traditional revenues and increases banks' demand for risky assets

The relationship

- We also test for the distributional effects caused by bank size and conclude that large banks are less affected by capital inflow liberalization
- This result supports our competition argument, since large banks have more market power than small banks in the credit markets
- Finally, we account for the mitigating effect of macroprudential policies
- The implementation of tight macroprudential policies helps to mitigate the positive shock of liberalization on bank credit risk

Contributions

- **First**, previous studies rely on the overall financial liberalization (Cubillas and González, 2014, Tanna et al., 2017)
- We focus on the narrow definition of financial liberalization to the global markets (namely, capital inflow liberalization)
- We use the index constructed by Fernández et al. (2016)
- Concentrating on the effect of capital inflow liberalization rather than on the overall financial liberalization, is important
- Since the overall definition cannot differentiate between changes in the domestic financial system and openness to the international capital markets

Contributions

- The de jure measure captures the official policy on capital flows
- The de facto measure (namely, capital flow indicators) is the result of capital inflow liberalization
- The de facto measure is the amount of capital that flows into a country during a period of time

Contributions

- **Second**, we explore the mechanism
- **On the liberalization side**, we use the sub-categories of capital inflows and examine their heterogeneous effects
- This heterogeneity analysis helps us to understand which account should be used to mitigate bank credit risk
- **On the bank side**, we explore potential channels, such as:
 - The decreasing credit growth and interest rate margin and
 - The increasing non-interest income through which capital inflow liberalization influences bank credit risk

Contributions

- **Finally**, we offer new evidence on the effectiveness of macroprudential policies
- Macroprudential policies have been widely used to sustain financial stability
- We confirm that macroprudential policies can mitigate the positive effect of capital inflow liberalization on bank credit risk

Research hypotheses

- **Hypothesis 1:** Capital inflow liberalization positively effects bank credit risk
- Competition shrinks traditional profits from loans and enhances banks' incentive to take risks
- Moreover, profit losses force banks to invest in other risky assets
- Furthermore, liberalization extends firms' financing channels and intensifies competition in bank credit
- Hence, liberalization has an evident positive influence on bank credit risk
- The discussion motivates our first hypothesis

Research hypotheses

- **Hypothesis 2:** Tight macroprudential policies help to mitigate the positive shock of capital inflow liberalization on bank credit risk
- The effectiveness of macroprudential policies on stabilizing the financial system has been discussed by the previous literature (for instance Ali and Iness, 2020)
- Tight macroprudential policies smoothen domestic credit expansion and international lending (Ahnert et al., 2021; Alam et al., 2019)

Sample and Methodology

- Our bank-level variables are from Bankscope
- We produce an unbalanced panel of non-performing loans and loan loss provisions for 5,660 banks over the period 1998–2018, across 71 economies and every continent
- 24 high-income economies and 47 middle and low-income economies
- The ratio variables are winsorized at the 5% level in both tails of the distribution, this helps to replace outliers and the most extremely misreported data

Sample and Methodology

- To test our first hypothesis, we run the following regression:

$$risk_{ijt} = \alpha + \beta open_{jt-1} + \gamma \sum bank_{ijt-1} + \delta \sum country_{jt-1} + \lambda_i + \theta_t + \varepsilon_{ijt} \quad \text{Eq.(1)}$$

We expect β to be positive, according to H1

- To test our second hypothesis, we run the following regression:

$$risk_{ijt} = \alpha + \beta_1 open_{jt-1} + \beta_2 mp_{jt-1} + \beta_3 open_{jt-1} mp_{jt-1} + \gamma \sum bank_{ijt-1} + \delta \sum country_{jt-1} + \lambda_i + \theta_t + u_{ijt} \quad \text{Eq.(2)}$$

- We expect β_3 to be negative, according to H2

Sample and Methodology

- **Dependent variable:** bank credit risk
- To construct the bank credit risk measure, we follow Dinger and te Kaat (2020) and Hirtle et al. (2020) and use non-performing loans and loan loss reserves
- The dependent variable is proxied using four variables:
 - Non-performing loans to gross loans ratio (npl)
 - Non-performing loans to total assets ratio (npl1)
 - Loan loss reserves to gross loans ratio (llr)
 - Loan loss reserves to total assets ratio (llr1)

Sample and Methodology

- **Independent variable**
- We measure capital inflow liberalization following Fernández et al. (2016)
- The Fernández inflow index takes values between 0 and 1, and the larger the index is, the tighter the de jure controls on capital inflows are
- We take 1 minus the Fernández inflow index as our main independent variable (openness), following Catão and te Kaat (2021)
- A higher value of openness represents less capital inflow controls and more capital inflow liberalization

Sample and Methodology

- **Control Variables--Bank level variables**
- Following Dinger and te Kaat (2020) and Jiménez et al. (2013)
- Logarithm of total assets (asset) → proxy for bank size
- Return on total assets (ROA) → proxy for bank profitability
- Loans to total assets ratio (lta) → proxy for bank liquidity
- Capital to total assets ratio (cap) → proxy for capital structure

Sample and Methodology

- **Control Variables--Country level variables**
- Real GDP per capita growth rate (gdppg) → Non-performing loans should increase in bad times (Jiménez et al., 2013)
- Monetary policy (bmgdp) → the ratio of broad money to current GDP following Guo et al. (2020)
- Macroprudential policies (mp), calculated as the sum of 17 macroprudential policy instruments from Alam et al. (2019) database

Empirical Results

Table 2. Main results.

	(1)	(2)	(3)	(4)
	<i>npl</i>	<i>npl1</i>	<i>llr</i>	<i>llr1</i>
<i>L.open</i>	2.828*** (3.10)	1.243*** (2.85)	1.319*** (2.99)	0.579** (2.19)
<i>Bank level variables</i>				
<i>L.asset</i>	-0.228 (-0.81)	0.084 (0.53)	-0.035 (-0.32)	0.023 (0.43)
<i>L.roa</i>	-0.400*** (-3.53)	-0.206*** (-3.06)	-0.243*** (-5.64)	-0.110*** (-4.10)
<i>L.lta</i>	0.027*** (3.51)	0.034*** (7.63)	0.009* (1.80)	0.019*** (7.94)
<i>L.cap</i>	-0.000 (-0.02)	0.001 (0.14)	0.013* (1.68)	0.003 (0.81)
<i>Country level variables</i>				
<i>L.gdppg</i>	-0.148** (-2.39)	-0.077** (-2.61)	-0.070*** (-2.69)	-0.029** (-2.30)
<i>L.bmgdp</i>	-0.021 (-1.35)	-0.013 (-1.64)	-0.014** (-2.09)	-0.007* (-1.77)
<i>L.mp</i>	-0.098*** (-3.32)	-0.050*** (-3.43)	-0.024 (-1.44)	-0.011 (-1.30)
<i>_cons</i>	8.621 (1.58)	-0.363 (-0.12)	3.616 (1.53)	0.390 (0.39)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
<i>N</i>	21109	21115	24123	24123
Adjusted R2	0.025	0.045	0.025	0.044
# of banks	4943	4945	5605	5605
# of countries	71	71	71	71

Robustness checks-Heterogeneity across different accounts

- We discuss which liberalization measure of capital inflows has a higher impact on bank risk
- The Fernández et al. (2016) dataset considers restrictions on capital inflows over the following categories: equity, bonds, money market, financial credit, and commercial credit
- In other words, the variable (Open) includes five sub-categories: equity market openness, bond market openness, money market openness, financial credits market openness, and commercial credits market openness

Robustness checks-Heterogeneity across different accounts

Table 3. The effect of different capital inflow liberalizations on non-performing loans.

	<i>npl</i>					<i>npll</i>				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	<i>eq</i>	<i>bq</i>	<i>mm</i>	<i>fc</i>	<i>cc</i>	<i>eq</i>	<i>bq</i>	<i>mm</i>	<i>fc</i>	<i>cc</i>
<i>L.open</i>	1.352 (1.66)	1.912*** (4.15)	1.046** (2.05)	1.259** (2.03)	0.502 (1.62)	0.515 (1.33)	0.720*** (3.53)	0.422* (1.94)	0.530** (2.21)	0.249 (1.33)
	<i>Bank level variables</i>									
<i>L.asset</i>	-0.185 (-0.64)	-0.194 (-0.67)	-0.230 (-0.81)	-0.205 (-0.72)	-0.240 (-0.85)	0.102 (0.64)	0.099 (0.61)	0.083 (0.52)	0.094 (0.59)	0.078 (0.49)
<i>L.roa</i>	-0.404*** (-3.57)	-0.402*** (-3.53)	-0.397*** (-3.50)	-0.401*** (-3.57)	-0.402*** (-3.54)	-0.208*** (-3.08)	-0.207*** (-3.06)	-0.205*** (-3.04)	-0.207*** (-3.08)	-0.207*** (-3.06)
<i>L.lta</i>	0.026*** (3.43)	0.027*** (3.48)	0.027*** (3.54)	0.026*** (3.44)	0.026*** (3.47)	0.034*** (7.55)	0.034*** (7.56)	0.035*** (7.61)	0.034*** (7.58)	0.034*** (7.62)
<i>L.cap</i>	0.000 (0.02)	-0.000 (-0.01)	-0.001 (-0.06)	-0.000 (-0.02)	-0.002 (-0.12)	0.001 (0.16)	0.001 (0.14)	0.001 (0.10)	0.001 (0.14)	0.000 (0.05)

Robustness checks-Heterogeneity across different accounts

Table 3 continued. The effect of different capital inflow liberalizations on non-performing loans¹

	<i>npll</i>					<i>npll</i>				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	<i>eq</i>	<i>bo</i>	<i>mm</i>	<i>fc</i>	<i>cc</i>	<i>eq</i>	<i>bo</i>	<i>mm</i>	<i>fc</i>	<i>cc</i>
<i>Country level variables</i>										
<i>L.gdppg</i>	-0.153**	-0.149**	-0.146**	-0.151**	-0.145**	-0.079***	-0.077**	-0.076**	-0.078***	-0.076**
	(-2.47)	(-2.42)	(-2.37)	(-2.51)	(-2.34)	(-2.68)	(-2.64)	(-2.60)	(-2.71)	(-2.55)
<i>L.bmgdp</i>	-0.019	-0.019	-0.019	-0.020	-0.019	-0.013	-0.013	-0.013	-0.013	-0.013
	(-1.24)	(-1.27)	(-1.21)	(-1.33)	(-1.29)	(-1.55)	(-1.58)	(-1.53)	(-1.61)	(-1.60)
<i>L.mp</i>	-0.100***	-0.106***	-0.106***	-0.112***	-0.101***	-0.051***	-0.053***	-0.054***	-0.056***	-0.051***
	(-3.47)	(-3.80)	(-3.64)	(-3.98)	(-3.47)	(-3.63)	(-3.88)	(-3.73)	(-4.01)	(-3.54)
<i>_cons</i>	8.807	8.372	9.657*	9.222*	10.284*	-0.209	-0.368	0.136	-0.084	0.382
	(1.60)	(1.50)	(1.77)	(1.69)	(1.90)	(-0.07)	(-0.12)	(0.04)	(-0.03)	(0.13)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	21109	21109	21106	21109	21109	21115	21115	21112	21115	21115
Adjusted R2	0.024	0.026	0.024	0.024	0.023	0.044	0.045	0.044	0.044	0.044
# of banks	4943	4943	4943	4943	4943	4945	4945	4945	4945	4945
# of countries	71	71	71	71	71	71	71	71	71	71

Robustness checks-Heterogeneity across different accounts

- Bonds (bo), money market (mm), and financial credit (fc) are significant, while equity (eq), and commercial credit (cc) are insignificant
- Firms can get finance from the equity markets only through an initial public offering
- Commercial credit is directly linked with international trade transactions (Fernández et al., 2016)
- Hence, the commercial credit that firms can get is constrained and limited
- Bond markets, money markets, and financial credit are the instruments that firms can directly use to get finance and pose a direct threat on banks' traditional businesses

Robustness checks-Heterogeneity across economies

Table . Capital inflow liberalization and income levels.

	High-income economies				Middle and low-income economies			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>npl</i>	<i>npl1</i>	<i>llr</i>	<i>llr1</i>	<i>npl</i>	<i>npl1</i>	<i>llr</i>	<i>llr1</i>
<i>L.open</i>	-3.980 (-1.26)	-1.479 (-1.02)	-0.384 (-0.20)	-0.227 (-0.24)	3.453*** (3.72)	1.429*** (3.18)	1.326*** (2.85)	0.576** (2.08)
<i>Bank level variables</i>								
<i>L.asset</i>	-0.453 (-1.49)	-0.102 (-0.50)	-0.159 (-1.13)	-0.141** (-2.09)	-0.222 (-0.67)	0.087 (0.43)	-0.053 (-0.33)	0.066 (0.92)
<i>L.roa</i>	-0.500*** (-3.82)	-0.217*** (-3.02)	-0.300*** (-5.46)	-0.121*** (-3.92)	-0.353*** (-2.87)	-0.190** (-2.52)	-0.212*** (-4.52)	-0.102*** (-3.21)
<i>L.lta</i>	0.006 (0.48)	0.026*** (3.42)	0.008 (0.96)	0.022*** (5.10)	0.039*** (5.09)	0.039*** (7.74)	0.011 (1.62)	0.018*** (5.93)
<i>L.cap</i>	0.027 (1.33)	0.011 (0.98)	0.018 (1.07)	0.005 (0.86)	-0.006 (-0.35)	-0.001 (-0.16)	0.011 (1.16)	0.002 (0.42)
<i>Country level variables</i>								
<i>L.gdppg</i>	-0.174*** (-3.56)	-0.076** (-2.69)	-0.091** (-2.34)	-0.030 (-1.56)	-0.115 (-1.58)	-0.059* (-1.71)	-0.049 (-1.60)	-0.022 (-1.51)
<i>L.bmgdp</i>	0.002 (0.23)	0.001 (0.16)	-0.006 (-1.19)	-0.001 (-0.28)	-0.041 (-1.49)	-0.026* (-1.81)	-0.020* (-1.73)	-0.014** (-2.05)
<i>L.mp</i>	-0.010 (-0.28)	0.008 (0.45)	-0.001 (-0.06)	0.003 (0.36)	-0.054 (-1.63)	-0.035 (-1.53)	0.015 (0.70)	0.006 (0.49)
<i>_cons</i>	17.540** (2.38)	4.645 (0.98)	5.683 (1.59)	2.944* (1.76)	10.066 (1.57)	0.517 (0.13)	6.247* (1.92)	0.921 (0.67)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9344	9345	10465	10465	11765	11770	13658	13658
Adjusted R2	0.065	0.107	0.038	0.075	0.032	0.048	0.035	0.048
# of banks	1800	1800	1978	1978	3143	3145	3627	3627
# of countries	24	24	24	24	47	47	47	47

Robustness checks-Large versus small banks

- Large banks are less susceptible to capital inflow liberalization than small banks
- Bank size is measured in three ways, with total assets, with the number of branches, and the listing status
- We include bank size and its interaction with liberalization into Eq. (1) to control for bank size

Robustness checks-Large versus small banks

Table 7. Distributional effect due to bank size.

	<i>npl</i>			<i>npll</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>L.open</i>	21.574*** (3.94)	10.036*** (2.81)	3.303*** (3.73)	11.617*** (3.64)	4.984*** (2.92)	1.568*** (3.91)
<i>L.open#L.asset</i>	-0.896*** (-3.54)			-0.496*** (-3.39)		
<i>L.open#L.bran</i>		-1.527*** (-2.78)			-0.754*** (-2.87)	
<i>L.open#L.list</i>			-2.225* (-1.67)			-1.526** (-2.01)
<i>L.bran</i>		1.163*** (2.68)			0.550** (2.58)	
	<i>Bank level variables</i>					
<i>L.asset</i>	0.290 (0.87)	0.132 (0.30)	-0.220 (-0.77)	0.371** (2.08)	0.209 (0.83)	0.090 (0.57)
<i>L.roa</i>	-0.401*** (-3.54)	-0.757*** (-4.56)	-0.400*** (-3.53)	-0.207*** (-3.07)	-0.461*** (-5.19)	-0.206*** (-3.06)
<i>L.lta</i>	0.026*** (3.51)	0.013 (0.80)	0.026*** (3.49)	0.034*** (7.61)	0.032*** (4.31)	0.034*** (7.62)
<i>L.cap</i>	0.001 (0.05)	0.043 (1.24)	0.000 (0.01)	0.002 (0.20)	0.021 (1.30)	0.001 (0.17)

Robustness checks-Large versus small banks

- The coefficients of the interaction terms (L.open#L.asset, L.open#L.bran, L.open#L.list) on non-performing loans are negative and significant indicating that bank credit risk following capital inflow liberalization decreases with bank size
- This finding is in line with Delis and Kouretas (2011)
- In other words, banks with high assets, many branches, or listing status can absorb the positive impact of capital inflow liberalization on credit risks

Robustness checks-The global financial crisis

- We drop the years (2007 and 2008) when the global financial crisis occurred
- We also, divide the sample into two subsamples: before 2008 and after 2008
- The positive influence of capital inflow liberalization still holds when the positive shock from the global financial crisis has been controlled

Robustness checks

- **Alternative measures**
- We use loan loss provisions to measure bank credit risk and Z-score to proxy for bankruptcy risk
- Loan loss provisions are divided by gross loans (llp) or total assets ($llp1$)
- Z-score is the standard deviation of return on assets (sd_ROA) divided by the return on assets (ROA) plus the capital-asset ratio (cap)
- We also use the standard deviation of return on assets (sd_ROA) to account for bank profitability risk
- The positive impact of capital inflow liberalization on bank risk remains

Robustness checks-Political institutions

- **Right-wing vs Left-wing governments**
- A more right-wing (conservative) government is prone to liberalize capital inflows (Furceri and Loungani, 2018)
- Thus, we expect that political institutions (pol) will increase capital inflow liberalization and bank risk
- We construct a variable pol. that takes value 1, 2, and 3 for left, center, and right-wing governments, respectively (Furceri and Loungani, 2018)
- The positive impact of capital inflow liberalization on bank risk remains

Robustness checks-Nonlinear relationships

- The heterogeneous effect of capital inflow liberalization on bank risk across high and middle and low economies may be from a potential nonlinear effect
- Because the advanced economies have relatively higher capital liberalization and lower bank risk
- We find that there is not a nonlinear relation between capital inflow liberalization and bank credit risk
- Hence, the heterogeneity between high and middle and low economies is unlikely to be driven by nonlinearity

Bank competition

- Capital inflow openness may increase competition among banks, which encourages banks to take on risks (Cubillas and González, 2014; Jiménez et al., 2013)
- Two channels, through which capital inflow liberalization effects bank risks
 - Firms' financing channel, and banks' risk aversion channel
 - Firms' financing channels are expanded after liberalization
- Thus, increasing competition in the loan market decreases banks' profitability (Giannetti, 2007)
- The growth rate of loans measures the dynamics of bank loan volumes (Dinger & te Kaat, 2020)
- The decrease in bank loan volumes reflects falling market shares of banks

Bank competition

- We use the growth rate of gross loans (*loang*) and the net interest-rate margin (*inma*) to proxy the competition in the credit market
- Capital account openness also increases risk appetite for banks
- Banking revenues include interest and non-interest revenues
- Williams (2016) argues that banks with higher non-interest revenues are riskier
- Thus, we use the ratio of non-interest income to operating revenues (*noin*) as revenue risk

Bank competition

Table 6. Bank competition effect.

	(1)	(2)	(3)
	<i>loang</i>	<i>inma</i>	<i>noin</i>
<i>L.open</i>	-13.864*** (-2.66)	-0.318 (-1.41)	5.613* (1.80)
<i>Bank level variables</i>			
<i>L.asset</i>	-13.918*** (-7.17)	-0.434*** (-3.08)	-1.531** (-2.18)
<i>L.roa</i>	0.455 (1.42)	0.080*** (3.06)	-0.175 (-1.25)
<i>L.lta</i>	-0.652*** (-11.57)	0.017*** (6.09)	-0.162*** (-6.60)
<i>L.cap</i>	-0.063 (-0.75)	0.019*** (2.80)	-0.119*** (-3.17)
<i>Country level variables</i>			
<i>L.gdppg</i>	-0.729** (-2.24)	-0.008 (-0.69)	0.165 (1.44)
<i>L.bmgdp</i>	0.004 (0.07)	-0.006* (-1.85)	0.065* (1.78)
<i>L.mp</i>	0.763* (1.73)	0.019 (1.65)	-0.350*** (-3.05)
<i>_cons</i>	348.711*** (8.42)	13.509*** (5.00)	68.811*** (4.62)
Bank FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
<i>N</i>	26559	26450	26626
Adjusted R2	0.227	0.040	0.023
# of banks	6073	6046	6092
# of countries	71	71	71

Bank competition

- Column (1) shows that banks, after openness, have a lower growth rate in credit
- So, the competition caused by capital flow liberalization weakens traditional banking activities and promotes non-traditional businesses
- Column (3) indicates that banks' non-interest income significantly increases after liberalization
- Capital inflow liberalization lowers traditional banking revenues and increases banks' demand for risky assets

The mitigating role of macroprudential policies

- Macroprudential policies have been implemented to maintain financial stability since the global financial crisis of 2008 (Edwards, 2021; Martinez Peria et al., 2018)
- Tight macroprudential regulations, such as high capital conservation buffers mitigate the positive influence of capital inflow liberalization on bank credit risk
- We add macroprudential policy and its interaction with capital inflow openness into Eq. (2) to test our second hypothesis

The mitigating role of macroprudential policies

Table 8. Mitigating effect of macroprudential policies.

	(1) <i>npl</i>	(2) <i>npl1</i>
<i>L.open</i>	3.215*** (3.58)	1.425*** (3.18)
<i>L.open#L.mp</i>	-0.201* (-1.87)	-0.095* (-1.67)
<i>Bank level variables</i>		
<i>L.asset</i>	0.012 (0.28)	0.002 (0.08)
<i>L.roa</i>	-0.231 (-0.82)	0.083 (0.53)
<i>L.lta</i>	-0.396*** (-3.54)	-0.204*** (-3.07)
<i>L.cap</i>	0.026*** (3.46)	0.034*** (7.55)
<i>Country level variables</i>		
<i>L.gdppg</i>	-0.000 (-0.00)	0.001 (0.15)
<i>L.bmgdp</i>	-0.020** (-2.12)	-0.010** (-2.07)
<i>L.mp</i>	-0.020 (-1.32)	-0.013 (-1.64)
<i>_cons</i>	8.252 (1.49)	-0.538 (-0.18)
Bank FE	Yes	Yes
Year FE	Yes	Yes
<i>N</i>	21109	21115
Adjusted R2	0.026	0.046
# of banks	4943	4945
# of countries	71	71

The mitigating role of macroprudential policies

- We find as expected a negative sign of the interaction coefficient (L.open#L.mp)
- The negative sign implies that a tightening of macroprudential policy helps to reduce the positive shock of capital inflow liberalization on bank credit risk

Policy Implications

- Authorities, especially in middle and low economies, should monitor individual bank credit risk when they liberalize the capital inflows
- More attention should be paid to bonds, money markets, and markets for financial credit
- Our results call for measures to smoothen the competition in credit market among financial institutions and constrain banks' non-traditional businesses
- Implementing tight macroprudential policies provides another macroeconomics toolkit to mitigate global shocks
- Our results suggest a supervision on small banks as they are more susceptible to liberalization

Conclusions

- We study the effect of de jure capital inflow liberalization on bank credit risk
- Bank credit risk proxied by non-performing loans
- Capital account openness, which expands firms' financing channels, positively impacts bank credit risk
- We also conduct heterogeneity tests
- We test which sub-account influences bank credit risk
- We test which group of countries (based on income levels) influences bank credit risk
- Middle and low economies drive this positive effect

Conclusions

- Capital inflow liberalization intensifies banks' competition and risk appetite and increases bank credit risk
- The positive effect is mitigated within large banks, banks with more assets, branches, or banks that are listed in the stock market
- Tightening macroprudential policies helps to mitigate the positive shock of capital inflow liberalization on bank credit risk

Questions

- Thank You very much

