



CONCENTRATION IN ASIA'S CROSS-BORDER BANKING: DETERMINANTS AND IMPACTS

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INTRODUCTION

- Cross-border bank credit is characterized by a small number of very sizeable links between banks in one country and borrowers in another, whereby largest-sized cross-border banking links are mainly between major advanced economies (Aldasoro and Ehlers, BIS, 2019).
- To date, there remains a lack of empirical literature on the causes and consequences of high cross-border bank concentration, as existing papers tend to focus on the patterns of cross-border concentration
- Other studies focus on concentration within the domestic banking sector (Barrell and Karim 2020; Beck, Demirguc-Kunt, and Levine 2006; Çifter 2015).
- High concentration can expose the region to financial risk and policy spillovers emanating from few counterparties and can lead to less efficient cross-border financial intermediation, with implications on the domestic financial system.

INTRODUCTION

- In this paper, we address the lack of an empirical assessment on the determinants and impacts of cross-border bank concentration. We focus on Asia and the Pacific due to
 - (i) region's financial systems generally rely heavily on the banking sector as the main source of corporate financing and for cross-border financial intermediation; and
 - (ii) cross-border bank claims and liabilities in Asia and the Pacific are characterized by a high and constant level of concentration compared to other regions.
- We complement existing research on implications and risks of cross-border banking exposures and increasing financial interconnectedness (ADB 2017, 2020; Dungey, Kangogo, and Volkov 2019); and cross-border interbank exposures as a source of contagion (Park and Shin 2017, 2018; Matousek 2019).

OUR PAPER

- We construct cross-border bank concentration indices for 47 economies in Asia and the Pacific from 2000 to 2019 using BIS Locational Banking Statistics.

Main research questions:

- Determinants: What factors are driving cross-country bank concentration?
- Impacts: What is the impact of elevated cross-border bank concentration on banking sector credit, stability, and profitability?

Main findings:

- While Asia and the Pacific exhibits high cross-border bank concentration, there are differences across subregions, with the Pacific having the highest and East Asia having the lowest concentration.
- Determinants: Higher capital account and trade openness and per capita income are significantly associated with lower cross-border bank concentration.
- Impacts: Bank concentration tends to decrease domestic credit and NPLs; while our results on bank profitability are inconclusive.

CONSTRUCTION BANK CONCENTRATION MEASURE: HERFINDAHL-HIRSCHMAN INDEX (HHI)

$$HHI_{i,t} = \sum_{j=1}^N (s_{j,t}^i)^2$$

- Where $s_{j,t}^i$ is the market share of reporter j at time t in country i 's cross-border position. We construct an index for each position, including cross-border claims (assets), liabilities, and total (claims plus liabilities).
- $t = 2000$ to 2019 .
- The market share refers to each reporting economy's bank cross-border position as % of the total cross-border bank position of counterparty i .
- Data source: BIS Locational Banking Statistics, Table A6.2. Reporters are classified by location of banking office.

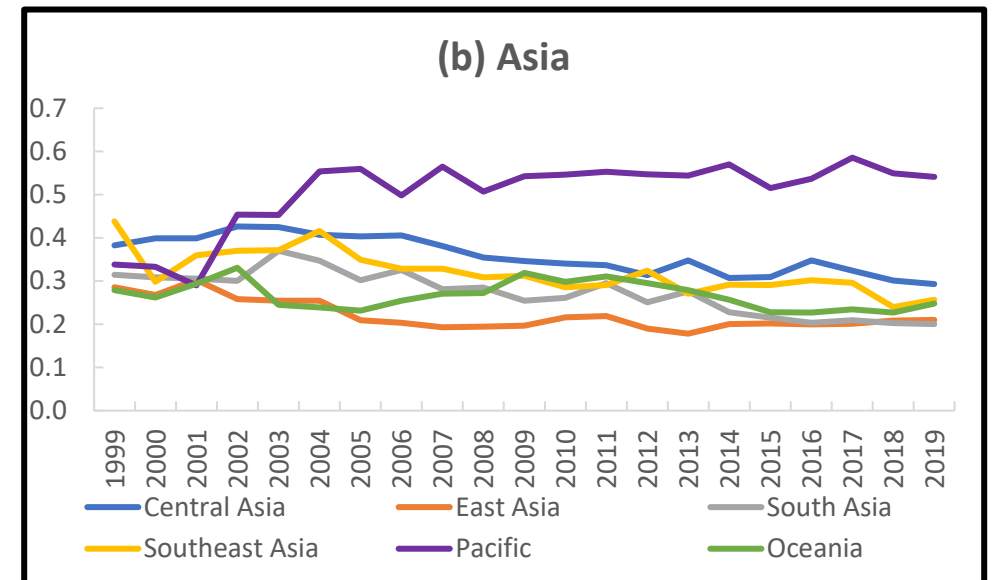
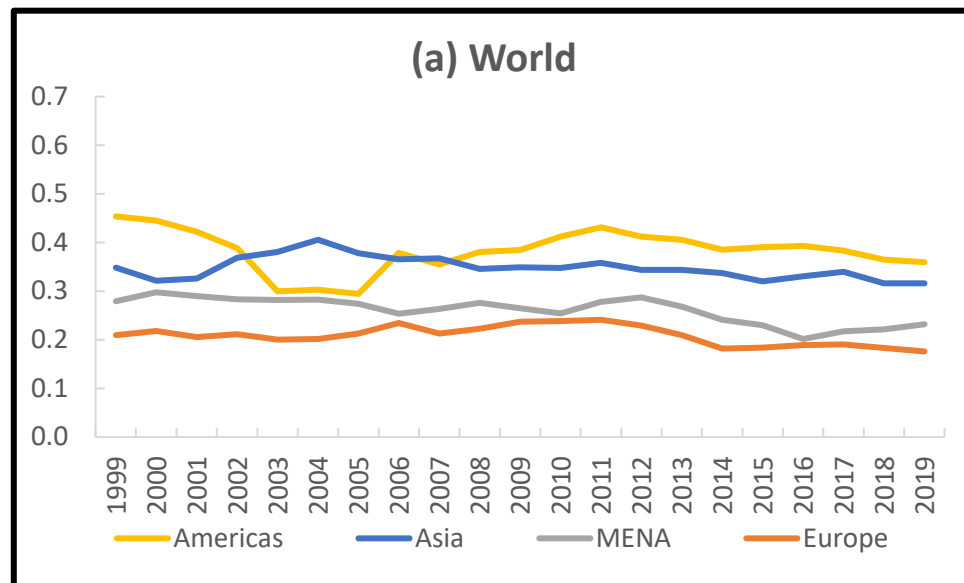


STYLIZED FACTS ON ASIA'S CROSS-BORDER BANK CONCENTRATION

CONCENTRATION OF ASIA'S CROSS-BORDER BANK LINKAGES ONE OF THE HIGHEST IN THE WORLD

- The Asia and the Pacific region exhibits one of the highest average HHI compared to other regions, with the trend being mostly constant over time.
- This is primarily driven by the high and rising average HHI in the Pacific region, where economies are dependent on few cross-border banking linkages.
- While Central Asia recorded the highest subregional average HHI from 1999-2006, the concentration of cross-border banking decreased considerably over the past two decades.

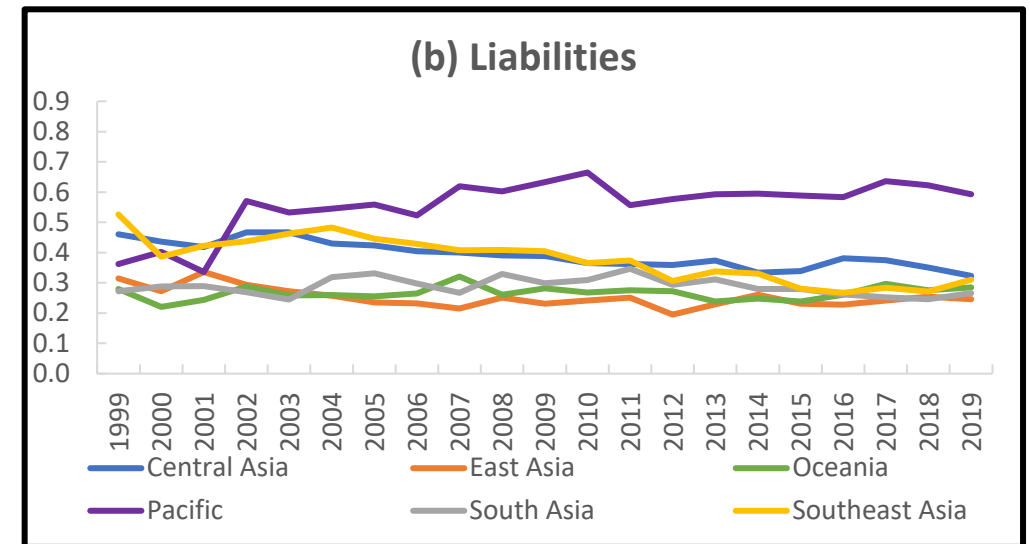
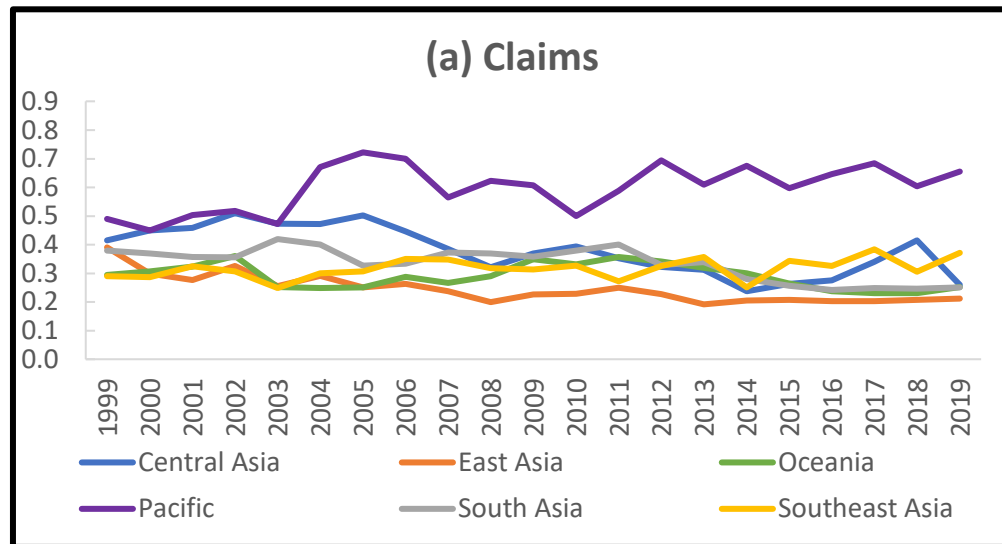
Figure 1: Cross-border Bank Concentration (HHI Total)



CONCENTRATION OF ASIA'S CROSS-BORDER BANK LINKAGES SIMILAR FOR CLAIMS AND LIABILITIES

- The Pacific's average HHI remained elevated for both cross-border claims and liabilities.
- This is followed by Central and Southeast Asia's, which have remained relatively high, too.

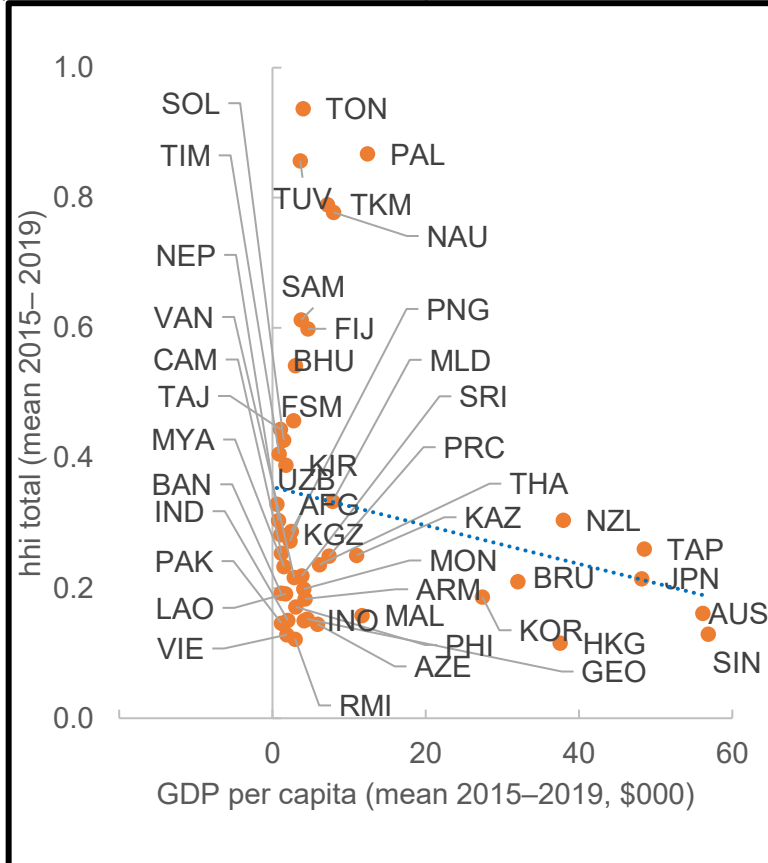
Figure 2: Cross-border Bank Concentration, Asia by Cross-border Position (HHI)



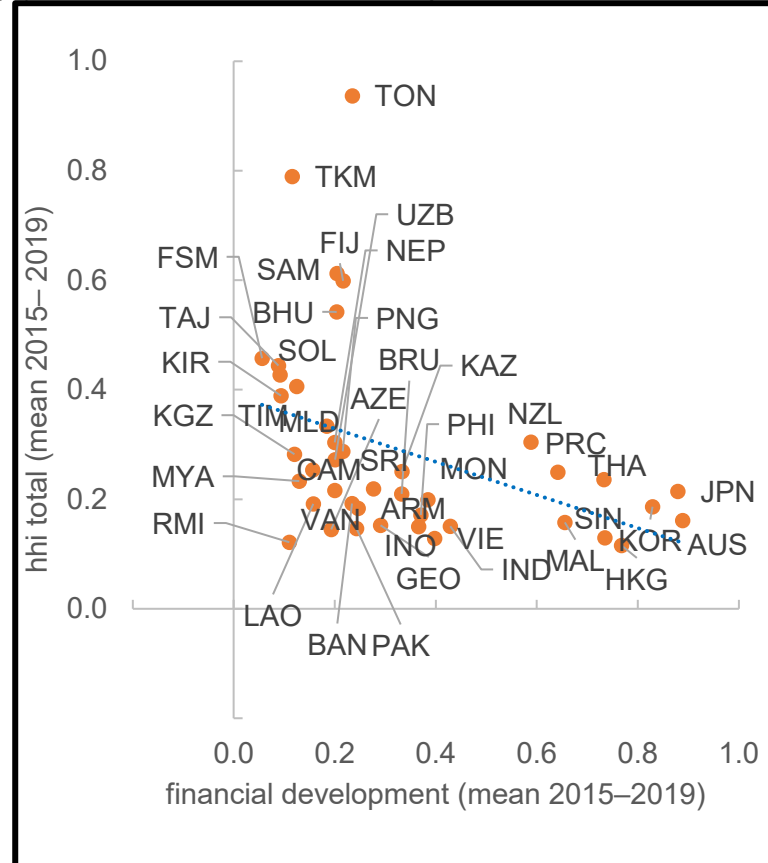
CROSS-BORDER BANK CONCENTRATION IS NEGATIVELY ASSOCIATED WITH ECONOMIC DEVELOPMENT, FINANCIAL DEVELOPMENT, AND TRADE OPENNESS

Figure 3: Correlation of HHI with Economic Development, Financial Development, and Trade Openness

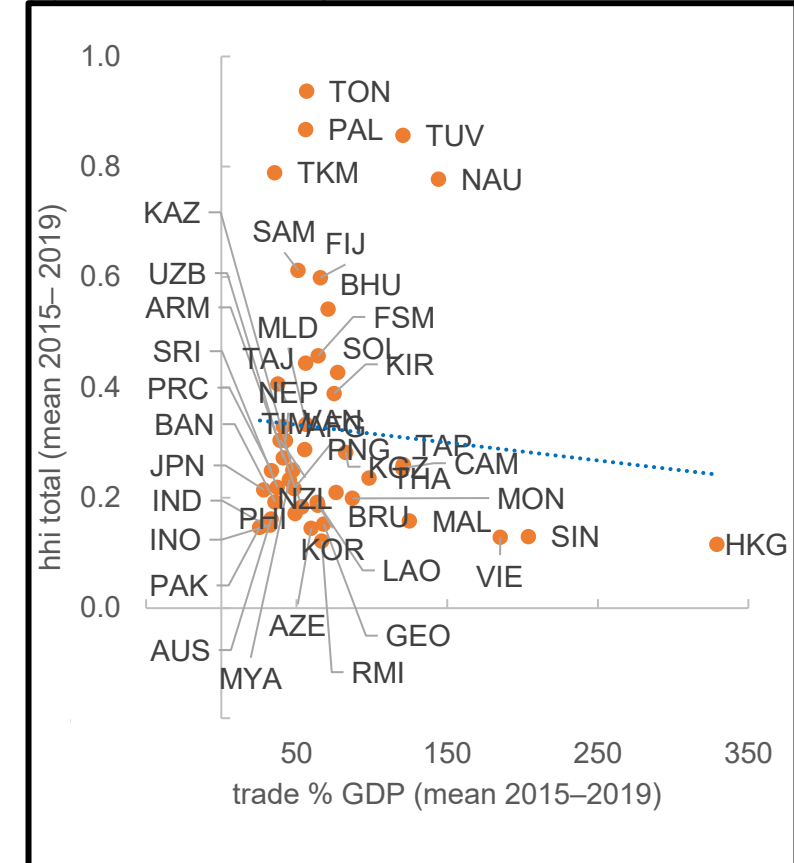
(a) HHI and economic development



(b) HHI and financial development



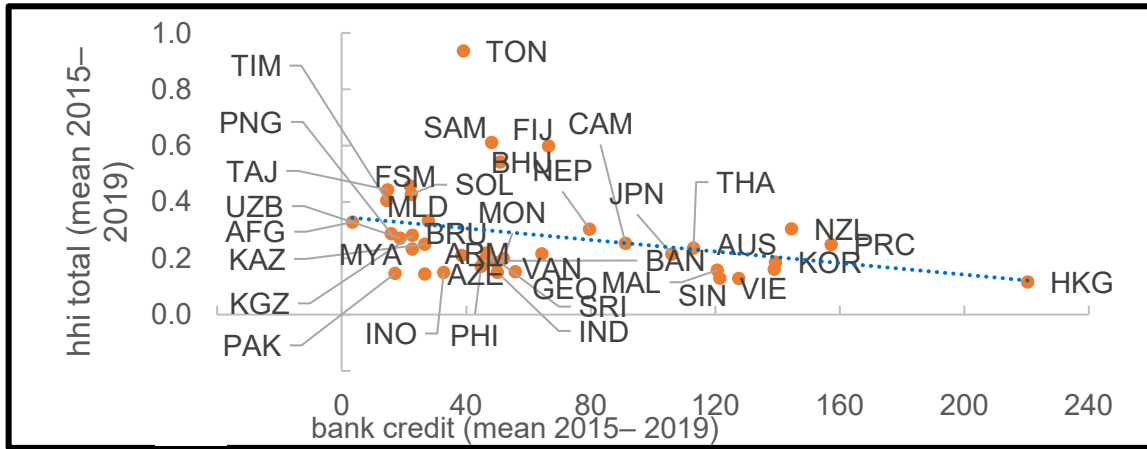
(c) HHI and trade openness



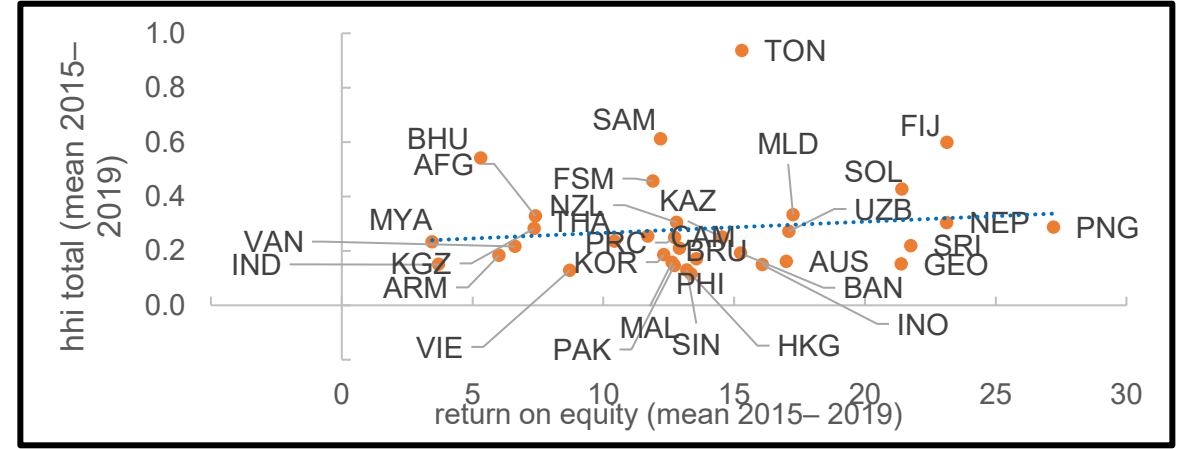
CROSS-BORDER BANK CONCENTRATION IS POSITIVELY ASSOCIATED WITH ROA & ROE AND NPLS; WHILE IT IS NEGATIVELY CORRELATED WITH BANK CREDIT

Figure 4: Correlation of HHI with Bank Credit, Stability and Profitability

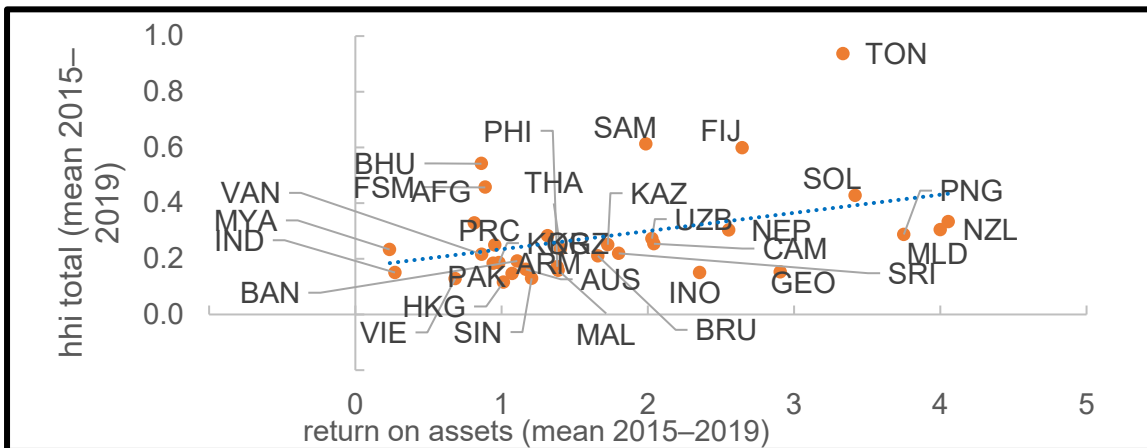
(a) HHI and bank credit



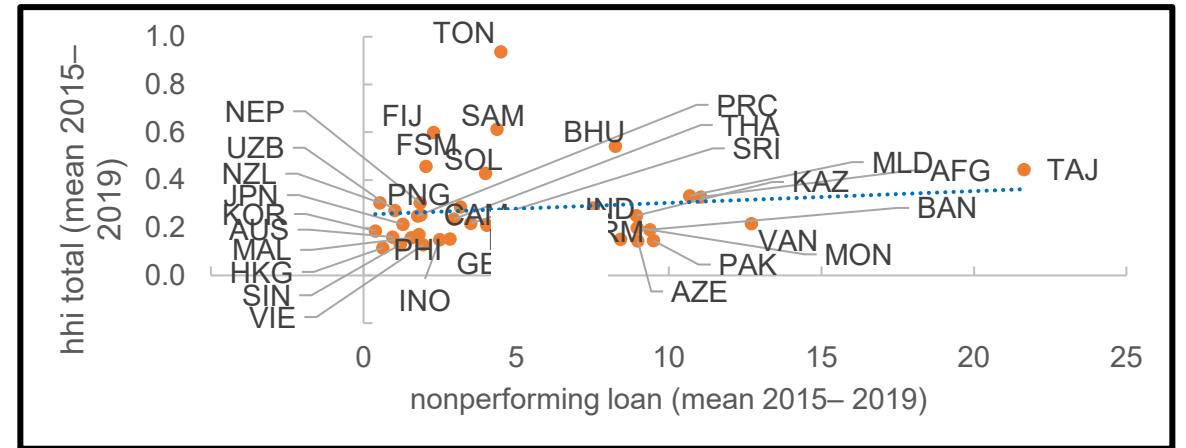
(b) HHI and return on equity



(c) HHI and return on assets



(b) HHI and nonperforming loan





EMPIRICAL SPECIFICATIONS AND RESULTS

EMPIRICAL SPECIFICATIONS:

To determine which factors influence the levels of HHI, we estimate:

$$HHI_{i,t} = \theta' x_{i,t-1} + \varepsilon_{i,t}$$

where HHI refers to either HHI total (HHI_ToT), HHI claims (HHI_CLM), or HHI liabilities (HHI_LIA) of country i at time t ; x is a row vector of lagged covariates with θ column of coefficients; and ε is the error term. We provide estimates for both fixed effect and pooled OLS estimation at annual frequency.

To assess the impact of HHI on bank lending, stability and profitability, we estimate:

$$BM_{i,t} = \beta_1 HHI_{i,t-1} + \theta' x_{i,t-1} + \varepsilon_{i,t}$$

where BM refers to bank measure of bank credit level and growth (domestic credit to private sector by banks), bank stability (nonperforming loans), and bank profitability (return on assets and return on equity) of country i at time t ; HHI are bank cross-border concentration indices (HHI_TOT, HHI_CLM, HHI_LIS), and x is a row vector of lagged bank measure covariates with θ column of coefficients; and ε is the error term. We provide estimates for both fixed effect and pooled OLS estimation.

DATA

1. Sample includes 47 Asia and the Pacific economies including Afghanistan; Armenia; Australia; Azerbaijan; Bangladesh; Bhutan; Brunei Darussalam; Cambodia; China, People's Republic of; Fiji; Georgia; Hong Kong, China; India; Indonesia; Japan; Kazakhstan; Kiribati; Korea, Republic of; Kyrgyz Republic; Lao PDR; Malaysia; Maldives; Marshall Islands; Micronesia, Federated States of; Mongolia; Myanmar; Nauru; Nepal; New Zealand; Pakistan; Palau; Papua New Guinea; Philippines; Samoa; Singapore; Solomon Islands; Sri Lanka; Taipei, China; Tajikistan; Thailand; Timor-Leste; Tonga; Turkmenistan; Tuvalu; Uzbekistan; Vanuatu; and Viet Nam
2. Annual values from 2000-2019.
3. HHI computed for total (claims plus liabilities), claims, and liabilities using BIS Locational Banking Statistics. We construct it on the basis of reported cross-border positions by BIS reporting economies on these 47 Asia and the Pacific economies.
4. Capital account openness refers to the Chinn-Ito index; Trade openness is merchandise exports and imports over nominal GDP; per capita income is log real GDP per capita; political stability is percentile ranking of political stability based on World Governance Indicators; inflation volatility is the annual standard deviation of monthly inflation; interest rate refers to lending rate or policy rate; budget balance refers to revenue minus expenditure over nominal GDP; inflation is the year-on-year change in consumer price index; GDP growth is the year-on-year change in real GDP; bank assets refers to total bank claims over nominal GDP; and financial center is a dummy variable with 1 being a financial center, and 0 otherwise.



DETERMINANTS OF CROSS-BORDER BANK CONCENTRATION

DETERMINANTS OF CROSS-BORDER BANK CONCENTRATION

Table 1: Determinants of HHI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_TOT	HHI_TOT	HHI_TOT	HHI_CLM	HHI_CLM	HHI_LIA	HHI_LIA
Capital openness	1.031 (1.306)	1.130 (1.475)	-2.636* (1.422)	-2.901* (1.468)	-0.656 (1.789)	-2.847* (1.602)	2.842 (1.910)	-1.477 (1.463)
Trade openness	0.022 (0.041)	0.033 (0.039)	-0.060*** (0.021)	-0.046** (0.021)	0.001 (0.044)	-0.031 (0.024)	-0.033 (0.033)	-0.063*** (0.020)
Per capita income	-20.846* (12.230)	-12.038*** (4.327)	-7.733*** (2.127)	-5.694** (2.218)	-11.918* (6.541)	-5.527* (2.736)	-6.783** (2.743)	-7.160*** (1.929)
Political stability	0.141 (0.096)	0.090 (0.085)	0.496*** (0.108)	0.458*** (0.099)	-0.003 (0.125)	0.460*** (0.105)	0.059 (0.076)	0.419*** (0.104)
Inflation volatility	0.716*** (0.260)	0.643** (0.272)	1.460** (0.564)	1.305** (0.552)	0.230 (0.352)	1.373* (0.718)	0.104 (0.277)	0.327 (0.364)
Financial center				-7.945** (3.152)		-13.515*** (3.876)		-6.574* (3.555)
Observations	689	689	689	689	689	689	689	689
R-squared	0.723	0.713	0.370	0.368	0.637	0.312	0.697	0.333
Economy FE	Yes	Yes	No	No	Yes	No	Yes	No
Year FE	Yes	No	Yes	No	No	No	No	No

Notes: Dependent variables are HHI_CLM, and HHI_LIA, and HHI_TOT. All regressors are lagged except Financial center. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 36 clusters. *** p<0.01, ** p<0.05, * p<0.1.

DETERMINANTS OF CROSS-BORDER BANK CONCENTRATION

Table 2: Sensitivity Test - Determinants of HHI (Using Financial Development)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_TOT	HHI_TOT	HHI_TOT	HHI_CLM	HHI_CLM	HHI_LIA	HHI_LIA
Capital openness	0.652 (1.345)	0.310 (1.428)	-3.610*** (1.319)	-3.469** (1.337)	-1.404 (1.597)	-3.264** (1.405)	2.409 (1.916)	-2.253 (1.465)
Trade openness	0.021 (0.042)	0.032 (0.045)	-0.041** (0.016)	-0.039** (0.018)	0.001 (0.050)	-0.025 (0.021)	-0.033 (0.035)	-0.055*** (0.015)
Financial development	0.043 (0.215)	-0.206 (0.146)	-0.385*** (0.059)	-0.427*** (0.103)	-0.263 (0.224)	-0.483*** (0.154)	-0.142 (0.119)	-0.505*** (0.089)
Political stability	0.088 (0.082)	0.040 (0.075)	0.396*** (0.079)	0.386*** (0.078)	-0.053 (0.124)	0.395*** (0.081)	0.030 (0.077)	0.326*** (0.086)
Inflation volatility	0.917** (0.396)	0.994** (0.415)	1.232** (0.604)	1.209** (0.576)	0.563 (0.483)	1.206* (0.711)	0.295 (0.265)	0.241 (0.336)
Financial center				2.736 (5.266)		-0.264 (7.648)		5.542 (4.559)
Observations	689	689	689	689	689	689	689	689
R-squared	0.703	0.693	0.422	0.408	0.624	0.360	0.691	0.385
Economy FE	Yes	Yes	No	No	Yes	No	Yes	No
Year FE	Yes	No	Yes	No	No	No	No	No

Notes: Dependent variables are HHI_CLM, HHI_LIA and HHI_TOT. All regressors are lagged except Financial center. Per capita income in log values. Robust clustered standard errors at country level are in parenthesis. Estimation yields 36 clusters. *** p<0.01, ** p<0.05, * p<0.1.

DETERMINANTS OF CROSS-BORDER BANK CONCENTRATION

Table 3: Sensitivity Test - Determinants of HHI (Removing Capital Openness)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_TOT	HHI_TOT	HHI_TOT	HHI_CLM	HHI_CLM	HHI_LIA	HHI_LIA
Trade openness	0.025 (0.040)	0.037 (0.040)	-0.079*** (0.024)	-0.062*** (0.022)	-0.000 (0.043)	-0.050** (0.024)	-0.022 (0.035)	-0.071*** (0.021)
Per capita income	-13.242 (11.903)	-11.652*** (4.190)	-8.176*** (2.155)	-6.218*** (2.221)	-12.436* (6.321)	-7.419*** (2.365)	-5.500* (2.780)	-6.785*** (2.192)
Political stability	0.114 (0.093)	0.080 (0.078)	0.477*** (0.109)	0.431*** (0.101)	-0.084 (0.126)	0.481*** (0.096)	0.032 (0.078)	0.384*** (0.096)
Inflation volatility	0.755*** (0.270)	0.664** (0.267)	1.403** (0.579)	1.203** (0.561)	0.117 (0.353)	1.213* (0.702)	0.232 (0.255)	0.303 (0.344)
Financial center				-9.841*** (3.588)		-13.971*** (3.862)		-8.574** (3.714)
Observations	765	765	765	765	765	765	765	765
R-squared	0.730	0.724	0.322	0.321	0.640	0.298	0.647	0.286
Economy FE	Yes	Yes	No	No	Yes	No	Yes	No
Year FE	Yes	No	Yes	No	No	No	No	No

Notes: Dependent variables are HHI_CLM, HHI_LIA, and HHI_TOT. All regressors are lagged except Financial center. Per capita income in log values. Robust clustered standard errors at country level are in parenthesis. Estimation yields 36 clusters. . *** p<0.01, ** p<0.05, * p<0.1.

DETERMINANTS OF CROSS-BORDER BANK CONCENTRATION

Table 4: Sensitivity Test - Determinants of HHI (Adding Domestic Bank Concentration)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_TOT	HHI_TOT	HHI_TOT	HHI_CLM	HHI_CLM	HHI_LIA	HHI_LIA
Capital openness	-0.856 (1.018)	-0.661 (0.984)	-2.065 (1.298)	-2.144 (1.298)	-1.070 (1.346)	-2.277 (1.370)	0.535 (1.011)	-0.401 (1.461)
Trade openness	0.017 (0.032)	0.017 (0.034)	-0.053*** (0.019)	-0.049** (0.019)	-0.004 (0.030)	-0.039* (0.023)	-0.025 (0.028)	-0.062*** (0.015)
Per capita income	-12.817 (10.511)	-15.461*** (5.278)	-4.309** (2.062)	-3.901** (1.903)	-19.913*** (6.324)	-4.254* (2.306)	-6.246** (2.690)	-5.440*** (1.451)
Political stability	0.039 (0.105)	0.049 (0.087)	0.248* (0.132)	0.242* (0.128)	-0.025 (0.124)	0.280** (0.127)	0.088 (0.076)	0.181 (0.132)
Inflation volatility	0.721 (0.482)	0.622 (0.439)	1.396* (0.823)	1.301 (0.775)	0.361 (0.402)	1.349 (0.895)	-0.257 (0.191)	-0.402 (0.482)
Bank concentration	-0.081 (0.060)	-0.060 (0.062)	0.236*** (0.081)	0.239*** (0.078)	-0.140** (0.069)	0.301*** (0.084)	0.024 (0.072)	0.226** (0.088)
Financial center				-2.057 (2.640)		-6.937* (3.579)		-0.736 (2.321)
Observations	579	579	579	579	579	579	579	579
R-squared	0.800	0.796	0.413	0.411	0.743	0.405	0.724	0.345
Economy FE	Yes	Yes	No	No	Yes	No	Yes	No
Year FE	Yes	No	Yes	No	No	No	No	No

Notes: Dependent variables are HHI_CLM, HHI_LIA, and HHI_TOT. All regressors are lagged except Financial center. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 36 clusters. *** p<0.01, ** p<0.05, * p<0.1.



IMPACT OF CROSS-BORDER BANK CONCENTRATION

IMPACT OF CROSS-BORDER BANK CONCENTRATION ON BANK CREDIT GROWTH

Table 5: Impact of HHI on Bank Credit Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT
HHI	-0.093*	0.044	-0.012	-0.056	-0.032	0.018	-0.012	-0.058*
	(0.049)	(0.046)	(0.070)	(0.049)	(0.028)	(0.020)	(0.033)	(0.033)
Per capita income	-3.194	-0.951	-1.808	5.018	-1.432***	-1.297**	-1.406**	-0.520
	(3.545)	(4.009)	(3.920)	(4.515)	(0.515)	(0.482)	(0.517)	(0.753)
Interest rate	-0.188	-0.122	-0.141	-0.396	0.228	0.202	0.219	0.034
	(0.442)	(0.469)	(0.461)	(0.397)	(0.172)	(0.179)	(0.171)	(0.176)
GDP growth	0.550	0.498	0.498	0.232	0.608*	0.707**	0.645**	0.707**
	(0.395)	(0.388)	(0.418)	(0.382)	(0.308)	(0.295)	(0.308)	(0.308)
Inflation	-0.776**	-0.813**	-0.802**	-0.686**	-0.726***	-0.752***	-0.743***	-0.734***
	(0.307)	(0.327)	(0.317)	(0.312)	(0.253)	(0.263)	(0.261)	(0.238)
Bank credit level				-0.238***				-0.058**
				(0.057)				(0.028)
Observations	611	611	611	611	611	611	611	611
R-squared	0.180	0.177	0.175	0.227	0.093	0.092	0.092	0.110
Estimation	FE	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS

Notes: Dependent variable is bank credit growth (%). All regressors are lagged. FE refers to country fixed effects. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 40 clusters. *** p<0.01, ** p<0.05, * p<0.1.

IMPACT OF CROSS-BORDER BANK CONCENTRATION ON BANK CREDIT GROWTH AND LEVEL

Table 6: Impact of HHI on Bank Credit Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT
HHI	0.134*	0.065	0.039	0.004	-0.440***	-0.289**	-0.597***	-0.020
	(0.079)	(0.053)	(0.073)	(0.020)	(0.160)	(0.130)	(0.174)	(0.014)
Per capita income	35.608***	34.661***	33.731***	6.307**	15.161***	15.307***	13.741***	-0.153
	(7.408)	(7.099)	(7.479)	(2.511)	(4.518)	(4.623)	(4.352)	(0.388)
Interest rate	-1.101**	-1.140**	-1.168**	-0.354**	-3.352***	-3.336***	-3.350***	-0.068
	(0.503)	(0.510)	(0.504)	(0.131)	(0.845)	(0.842)	(0.811)	(0.052)
GDP growth	-1.208**	-1.105**	-1.150**	-0.070	1.842	1.949	1.628	0.247***
	(0.460)	(0.436)	(0.468)	(0.138)	(1.253)	(1.277)	(1.195)	(0.081)
Inflation	0.357**	0.367**	0.402**	0.036	-0.209	-0.260	-0.497	-0.060
	(0.172)	(0.173)	(0.170)	(0.062)	(0.455)	(0.435)	(0.339)	(0.043)
Bank credit level (lag)				0.849***				0.995***
				(0.065)				(0.018)
Observations	613	613	613	611	613	613	613	611
R-squared	0.940	0.940	0.939	0.988	0.606	0.592	0.628	0.985
Estimation	FE	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS

Notes: Dependent variables are bank credit levels and growth (%). All regressors are lagged, except Financial center. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 40 clusters . *** p<0.01, ** p<0.05, * p<0.1.

IMPACT OF CROSS-BORDER BANK CONCENTRATION ON BANKING SECTOR STABILITY

Table 7: Impact of HHI on Nonperforming Loans

	(1) HHI TOT	(2) HHI CLM	(3) HHI LIA	(4) HHI TOT	(5) HHI TOT	(6) HHI CLM	(7) HHI LIA	(8) HHI TOT
HHI	-0.050 (0.057)	-0.122* (0.066)	-0.001 (0.048)	-0.035 (0.028)	-0.028 (0.021)	-0.055** (0.021)	-0.023 (0.025)	-0.003 (0.007)
Per capita income	-8.745*** (2.350)	-9.934*** (2.024)	-8.181*** (2.703)	-0.642 (1.437)	-1.686** (0.691)	-1.764** (0.690)	-1.695** (0.686)	-0.050 (0.140)
Interest rate	0.685** (0.323)	0.624** (0.282)	0.712** (0.345)	0.220 (0.152)	0.305* (0.157)	0.344** (0.165)	0.303* (0.156)	0.044 (0.055)
GDP growth	-0.626*** (0.154)	-0.639*** (0.161)	-0.608*** (0.149)	-0.124 (0.155)	-0.440** (0.192)	-0.516** (0.198)	-0.417** (0.188)	-0.047 (0.081)
Inflation	-0.053 (0.090)	-0.050 (0.091)	-0.054 (0.085)	0.138 (0.083)	-0.093 (0.162)	-0.109 (0.162)	-0.093 (0.162)	0.135* (0.072)
Budget balance	0.125 (0.126)	0.122 (0.122)	0.068 (0.126)	0.056 (0.072)	0.014 (0.134)	0.024 (0.138)	0.006 (0.135)	-0.023 (0.026)
NPL (lag)				0.688*** (0.122)				0.773*** (0.066)
Observations	501	501	501	487	501	501	501	487
R-squared	0.574	0.602	0.570	0.783	0.212	0.232	0.210	0.762
Estimation	FE	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS

Notes: Dependent variable is nonperforming loans (%). All regressors are lagged. FE refers to country fixed effects. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 37 clusters. *** p<0.01, ** p<0.05, * p<0.1.

IMPACT OF CROSS-BORDER BANK CONCENTRATION ON BANKING SECTOR PROFITABILITY

Table 8: Impact of HHI on Bank Profitability

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Return on Assets						Return on Equity					
	HHI TOT	HHI CLM	HHI LIA	HHI TOT	HHI CLM	HHI LIA	HHI TOT	HHI CLM	HHI LIA	HHI TOT	HHI CLM	HHI LIA
HHI	0.005 (0.012)	0.007 (0.008)	-0.004 (0.008)	0.015 (0.011)	0.009 (0.010)	0.016 (0.012)	0.092 (0.146)	0.034 (0.100)	0.005 (0.082)	0.105 (0.107)	0.031 (0.087)	0.109 (0.108)
GDP growth	0.002 (0.022)	0.001 (0.021)	0.003 (0.022)	0.028 (0.019)	0.024 (0.020)	0.029 (0.020)	-0.023 (0.117)	-0.021 (0.112)	-0.017 (0.114)	0.078 (0.142)	0.033 (0.144)	0.076 (0.148)
Inflation	-0.009 (0.042)	-0.009 (0.042)	-0.009 (0.042)	-0.038 (0.037)	-0.038 (0.038)	-0.038 (0.036)	-0.355 (0.397)	-0.349 (0.399)	-0.353 (0.400)	-0.404 (0.351)	-0.403 (0.363)	-0.403 (0.351)
Political stability	-0.000 (0.015)	-0.000 (0.015)	-0.001 (0.015)	0.002 (0.006)	0.003 (0.006)	0.002 (0.006)	-0.033 (0.092)	-0.030 (0.092)	-0.034 (0.093)	-0.062 (0.054)	-0.040 (0.051)	-0.056 (0.051)
Bank assets	-0.006** (0.002)	-0.006** (0.002)	-0.006*** (0.002)	-0.001 (0.003)	-0.002 (0.003)	-0.000 (0.003)	-0.089** (0.038)	-0.091** (0.037)	-0.093** (0.036)	-0.018 (0.022)	-0.030 (0.022)	-0.013 (0.024)
Financial center				-0.831** (0.326)	-0.830** (0.352)	-0.886*** (0.321)				1.015 (2.453)	0.610 (2.478)	0.648 (2.430)
Observations	436	436	436	436	436	436	434	434	434	434	434	434
R-squared	0.555	0.556	0.555	0.156	0.138	0.162	0.502	0.498	0.498	0.057	0.035	0.060
Estimation	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS

Notes: Dependent variables are return on assets and return on equity (%). All regressors are lagged except Financial center. Per capita income in log values. FE refers to country fixed effects. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 37 clusters. *** p<0.01, ** p<0.05, * p<0.1.

KEY FINDINGS

1. Higher capital account and trade openness, as well as per capita income are significantly associated with lower HHI.
2. Higher political stability and inflation volatility are significantly associated with higher HHI.
3. Financial centers tend to have lower HHI.
4. Higher HHI is significantly associated with lower bank credit growth, and bank credit levels.
5. We find some evidence that higher cross-border bank asset concentration (HHI_CLM) is significantly associated with lower nonperforming loans in our Asia and the Pacific sample.
6. We find no evidence that cross-border bank concentration is associated with bank profitability measures.



CONCLUDING REMARKS AND POLICY CONSIDERATIONS

CONCLUDING REMARKS

1. The Asia and the Pacific region has one of the world's highest cross-border bank concentration, which exposes the region to risk and policy spillovers.
2. But there are differences across subregions, with the Pacific having the highest concentration and East Asia having the lowest concentration.
3. We find evidence that economic openness, financial development, and financial center tend to significantly lower cross-border concentration, while macroeconomic volatility increases it.
4. Bank concentration tends to decrease domestic credit levels and growth as well as nonperforming loans, but we find no evidence on the relevance of cross-border bank concentration on bank profitability.



POLICY CONSIDERATIONS

1. Monitor and diversify cross-border bank exposures
2. Develop capital markets and broaden investor base to diversify financing sources
3. Strengthen financial safety nets to safeguard domestic and regional financial stability

THANK YOU!

Questions / Comments / Feedback?

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ADDITIONAL SLIDES

IMPACT OF CROSS-BORDER BANK CONCENTRATION ON BANK CREDIT GROWTH

Table 9: Sensitivity Test – Impact of HHI on Bank Credit Growth and Bank Credit Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT
HHI	-0.146 (0.086)	0.018 (0.058)	0.035 (0.106)	-0.110 (0.091)	-0.051 (0.051)	-0.004 (0.044)	0.022 (0.057)	-0.075 (0.060)
Per capita income	-4.494 (5.072)	-1.628 (6.201)	-1.399 (6.170)	5.711 (6.935)	-1.608** (0.620)	-1.476** (0.585)	-1.418** (0.634)	-0.806 (0.947)
Interest rate	0.117 (0.650)	0.206 (0.683)	0.203 (0.702)	-0.317 (0.667)	0.131 (0.232)	0.148 (0.227)	0.129 (0.227)	-0.007 (0.266)
GDP growth	0.665 (0.436)	0.553 (0.458)	0.597 (0.465)	0.334 (0.453)	0.766** (0.361)	0.791** (0.373)	0.836** (0.367)	0.786** (0.362)
Inflation	-0.951*** (0.277)	-0.985*** (0.298)	-0.975*** (0.293)	-0.837*** (0.271)	-0.894*** (0.240)	-0.923*** (0.253)	-0.926*** (0.249)	-0.880*** (0.231)
Bank credit level	0.054 (0.117)	0.027 (0.140)	0.139 (0.123)	0.037 (0.114)	0.046 (0.085)	0.014 (0.091)	0.147* (0.075)	0.014 (0.091)
Share of external credit	-0.002 (0.002)	-0.000 (0.001)	-0.003* (0.002)	-0.002 (0.002)	-0.000 (0.001)	-0.000 (0.001)	-0.002* (0.001)	0.000 (0.001)
HHI*share of external credit				-0.328*** (0.085)				-0.048 (0.037)
Observations	453	453	453	453	453	453	453	453
R-squared	0.253	0.240	0.246	0.299	0.129	0.123	0.131	0.139
Estimation	FE	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS

Notes: Dependent variable is bank credit (% GDP). All regressors are lagged. FE refers to country fixed effects. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 40 clusters. *** p<0.01, ** p<0.05, * p<0.1.

IMPACT OF CROSS-BORDER BANK CONCENTRATION ON BANKING SECTOR STABILITY

Table 11: Sensitivity Test – Impact of HHI on Nonperforming Loans

	(1)	(2)	(3)	(4)	(5)	(6)
	HHI_TOT	HHI_CLM	HHI_LIA	HHI_TOT	HHI_CLM	HHI_LIA
HHI	-0.035 (0.028)	-0.051 (0.048)	-0.010 (0.017)	-0.003 (0.007)	-0.006 (0.010)	-0.002 (0.006)
Per capita income	-0.642 (1.437)	-1.244 (2.178)	-0.282 (1.232)	-0.050 (0.140)	-0.064 (0.147)	-0.044 (0.146)
Interest rate	0.220 (0.152)	0.221 (0.143)	0.235 (0.167)	0.044 (0.055)	0.050 (0.063)	0.044 (0.054)
GDP growth	-0.124 (0.155)	-0.145 (0.182)	-0.109 (0.148)	-0.047 (0.081)	-0.057 (0.094)	-0.043 (0.076)
Inflation	0.138 (0.083)	0.131* (0.074)	0.137* (0.080)	0.135* (0.072)	0.132* (0.069)	0.135* (0.072)
Budget balance	0.056 (0.072)	0.046 (0.069)	0.025 (0.059)	-0.023 (0.026)	-0.022 (0.025)	-0.024 (0.026)
NPL (lag)	0.688*** (0.122)	0.663*** (0.154)	0.691*** (0.118)	0.773*** (0.066)	0.770*** (0.072)	0.774*** (0.066)
Observations	487	487	487	487	487	487
R-squared	0.783	0.786	0.781	0.762	0.762	0.762
Estimation	FE	FE	FE	Pooled OLS	Pooled OLS	Pooled OLS

Notes: Dependent variable is nonperforming loans (%). All regressors are lagged. FE refers to country fixed effects. Per capita income in log values. Sample includes economies in Asia and the Pacific. Robust clustered standard errors at country level are in parenthesis. Estimation yields 37 clusters. *** p<0.01, ** p<0.05, * p<0.1.