COVID, Credit, and Contagion Risks to ASEAN+3 Financial Systems

Wei Sun, Financial Specialist

4th Joint Regional Financing Arrangements Research Seminar

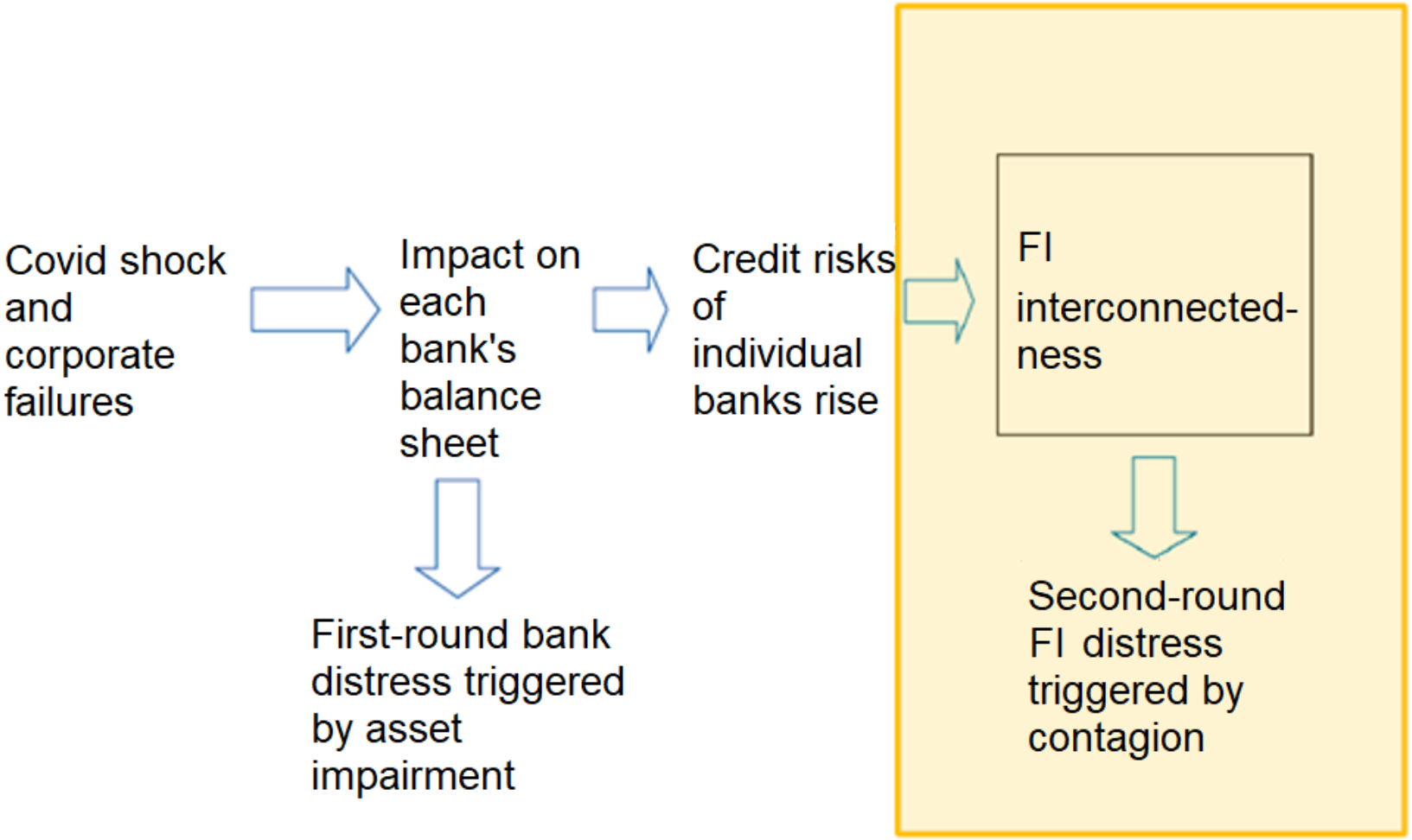
16 December, 2020

AMRO

ASEAN +3 MACROECONOMIC RESEARCH OFFICE

The Covid shock increases the credit risks of individual banks, which could propagate through contagion

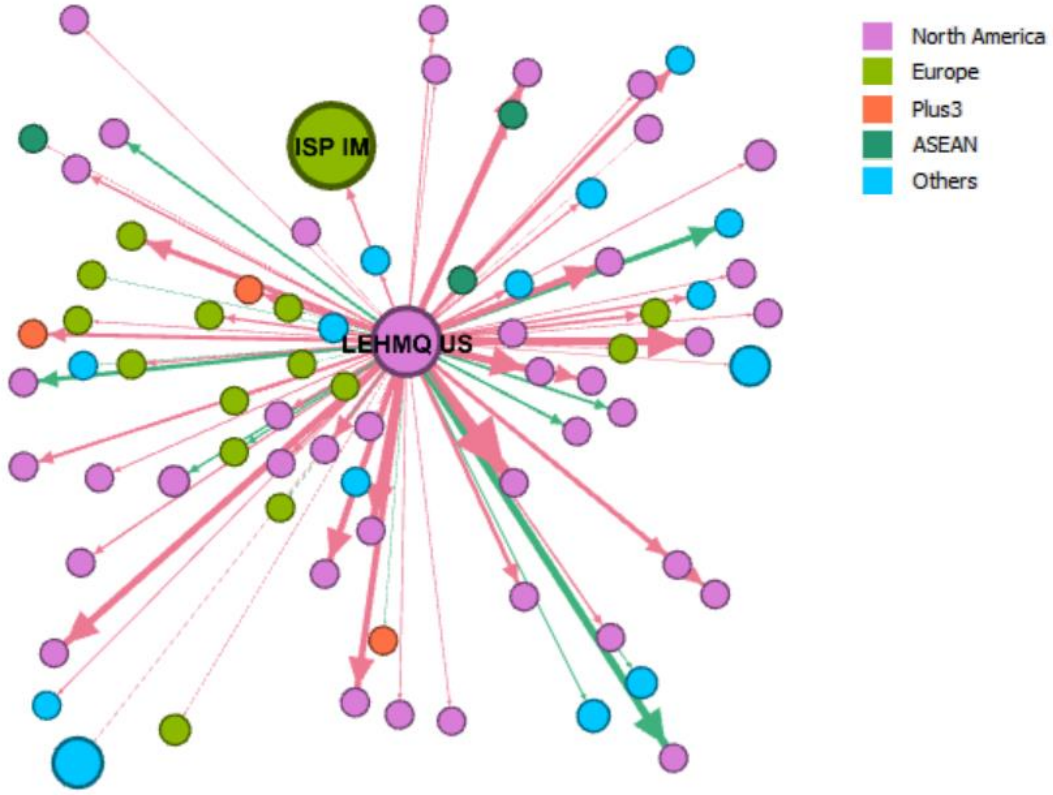
Shock Transmission in the Financial System



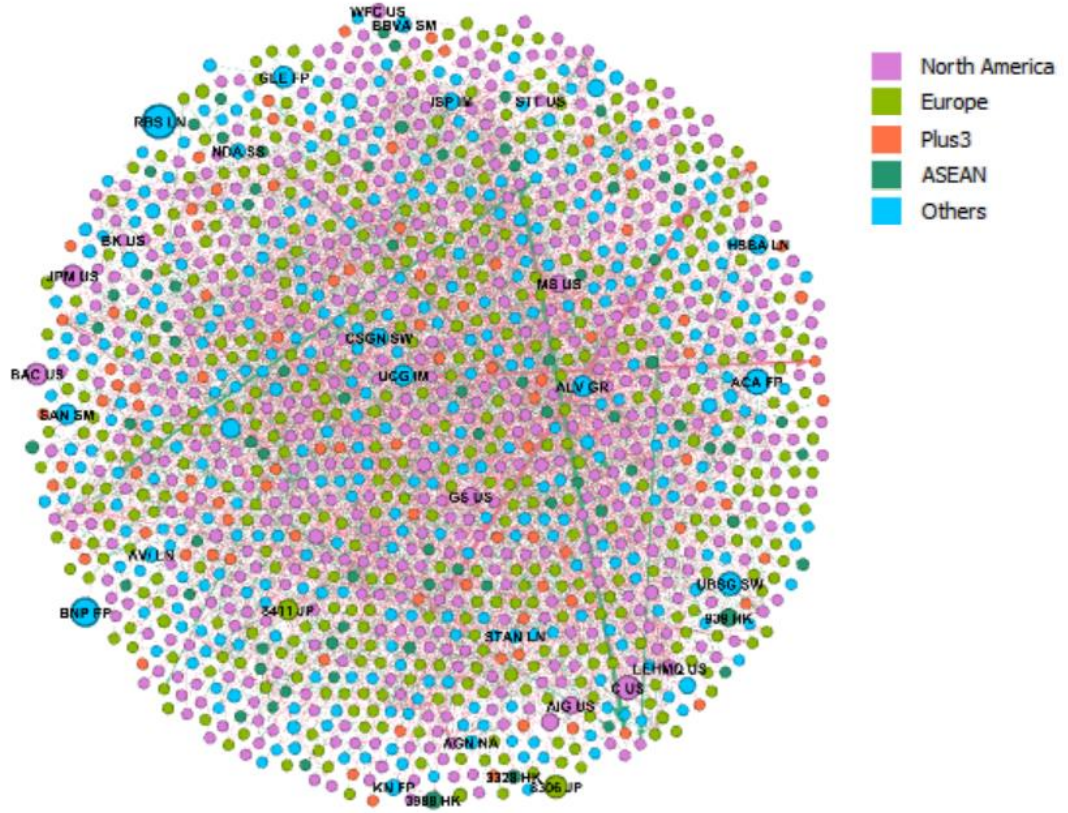
Sources: AMRO staff.

Capturing the first- and higher-order interconnectedness is important for estimating impact

Lehman: First-order Connections, August 2008



Lehman: First- and Second-order Connections, August 2008



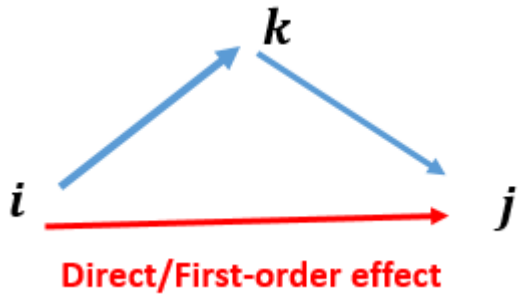
Sources: The Credit Research Initiative of National University of Singapore; and AMRO staff estimates.

We use the probability of default (PDs) of financial institutions in LASSO regressions to determine interconnectedness

$$PD_j = \alpha + \beta_{j,1} PD_1 + \beta_{j,2} PD_2 + \cdots + \beta_{j,i} PD_i + \cdots \beta_{j,n} PD_n + e_j,$$

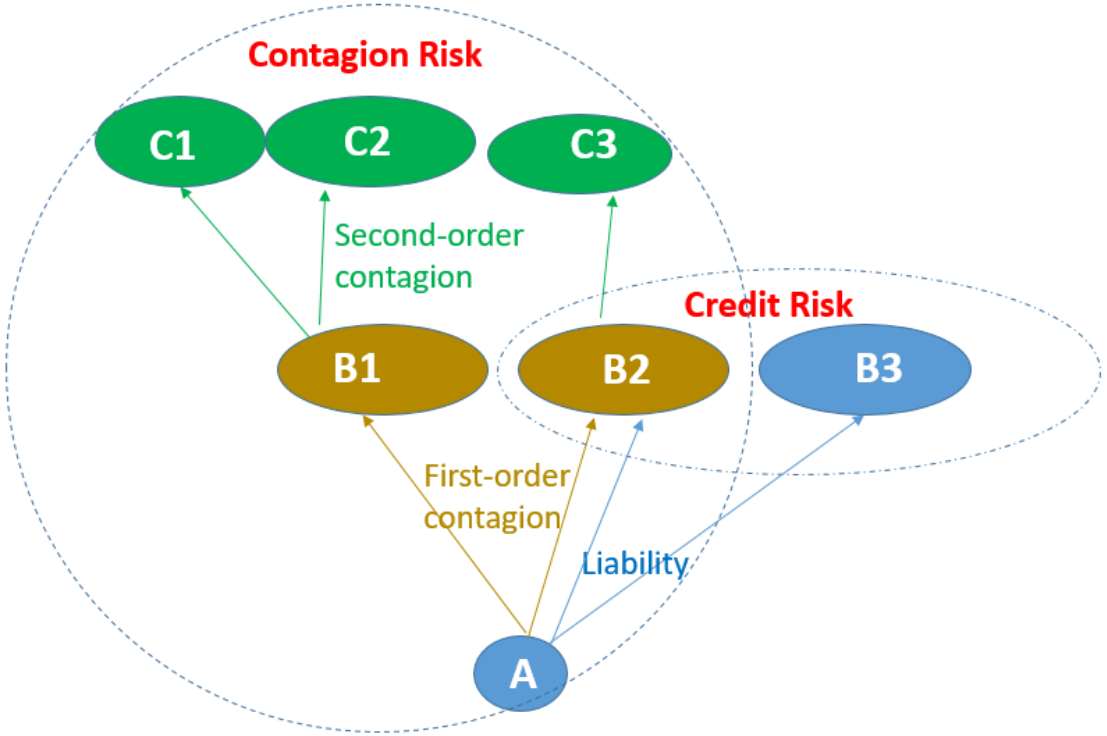
where $\beta_{j,i}$ is the direct/first-order impact of i on j,

$i = 1,2, \ldots n, j = 1,2, \ldots n,\ i \neq j, n \approx 2000$



Rising bank credit risk could lead to asset impairment of direct creditors and collateral damage to the broader financial system

Affected Parties of Bank A's Credit and Contagion Risks



Source: AMRO staff.

Loss to direct creditors due to credit risk:

$$\Delta Expected\ Loss_{A's\ creditors} = \Delta PD_A \times LGD_{A's\ creditors} \times \mathrm{EAD}_{A's\ creditors},$$

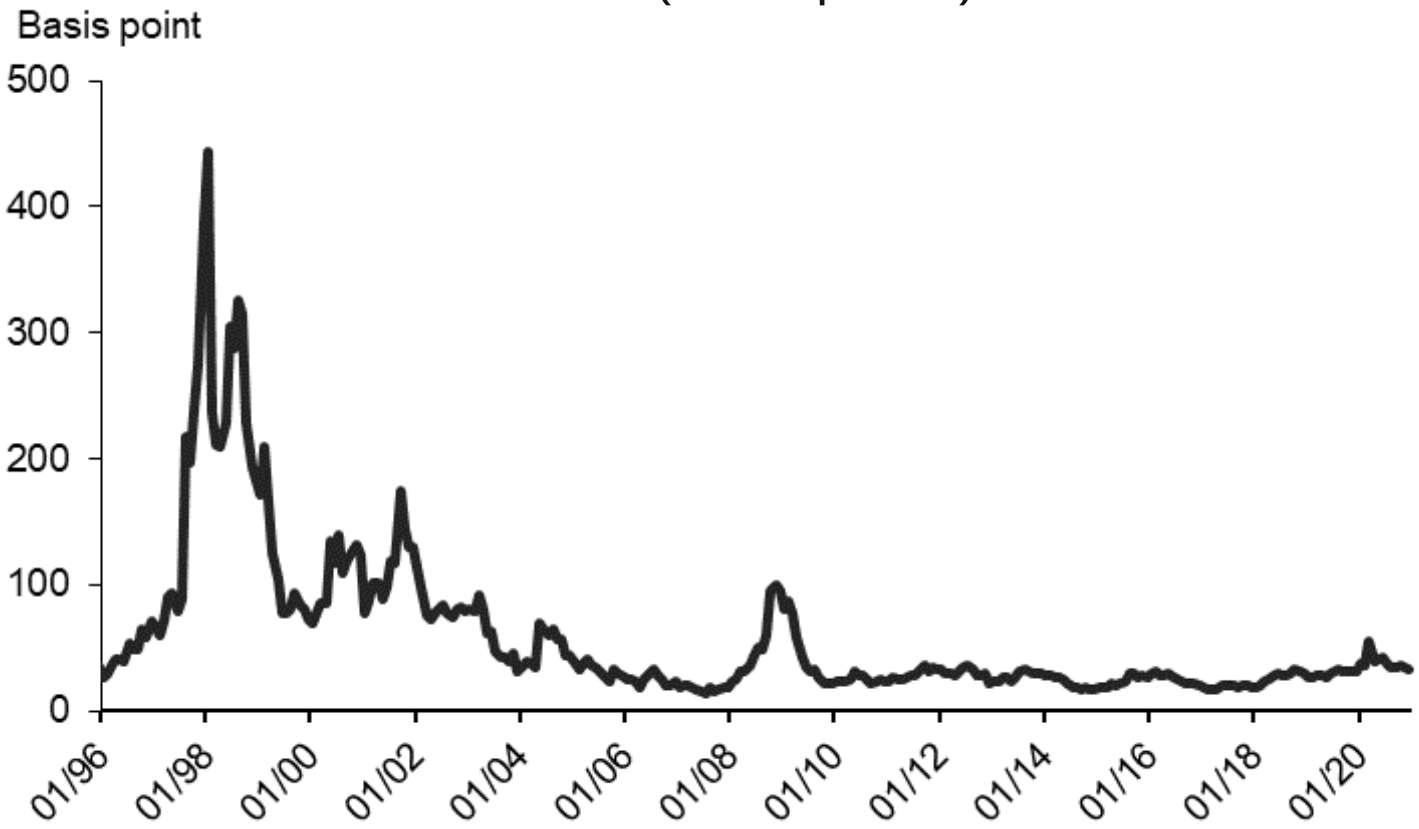
where LGD =60% and EAD=A's total liabilities.

Collateral damage to system due to contagion:

$$\Delta Expected\ Collateral\ Damage = \sum_{i=1}^{2} \Delta EL_{Creditors\ to\ FIs\ at\ A's\ ith\ order\ contagion}$$

The region's banking systems have been resilient but exit from supportive policies could pose a risk to financial stability

Asia Pacific: 1-year Probability of Default of Emerging Market Banking Sector
(Basis points)

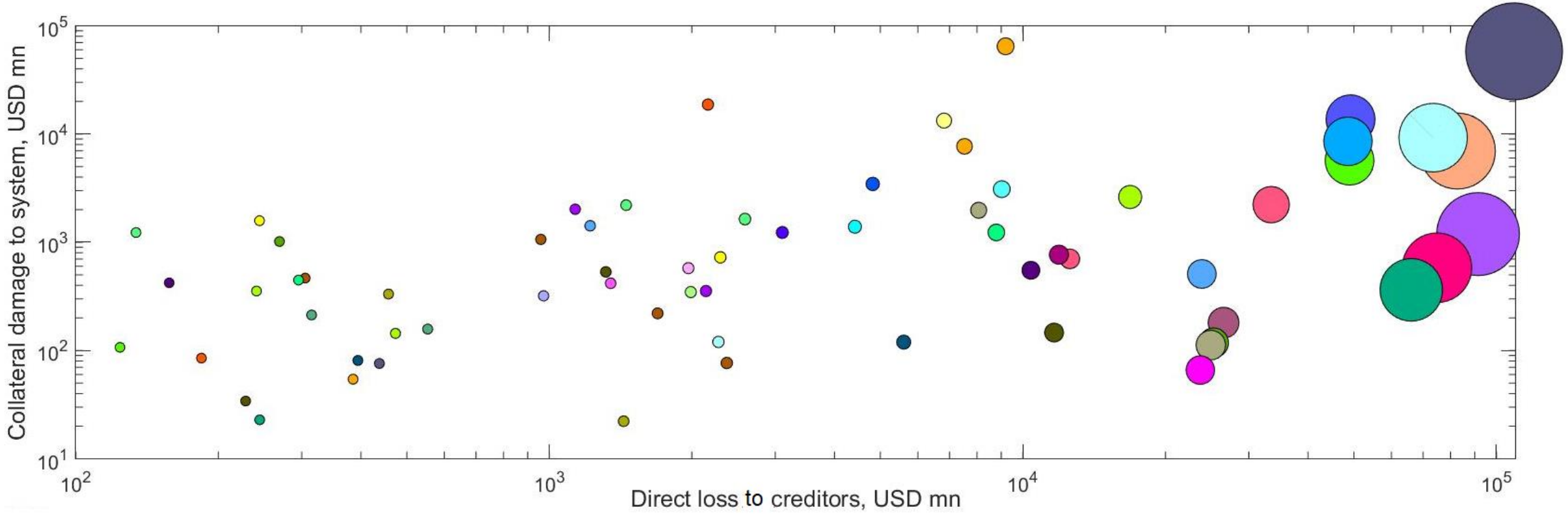


Source: The Credit Research Initiative of National University of Singapore.

An AFC-sized shock (400 basis points) to the region's G-SIBs and D-SIBs could be very costly for the fiscal purse…

ASEAN+3: Loss to Direct Creditors and "Collateral Damage" of G-SIBs and D-SIBs from a 400 Basis Point Increase in PDs

(USD, million)



Sources: The Credit Research Initiative of National University of Singapore; and AMRO staff estimates.

Note: 10^1=10, 10^2=100, 10^3=1,000, 10^4=10,000, and 10^5=100,000. Each node represents a G-SIB/D-SIB in the region. The size of the node reflects the relative size of the bank's liabilities. Data are as of October 2020.

… with the two financial centres estimated to be worst hit in GDP terms

ASEAN+3 Banks: Loss to Direct Creditors and "Collateral Damage" caused by G-SIBs and D-SIBs of a Particular Economy from a Collective 400 Basis Point Increase in PDs
(USD, million)

Loss Component	Financial System									
	China	Japan	Korea	Hong Kong	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Collateral damage due to contagion from source entities										
(1) To own financial system	73,644.0	106,787.6	3,368.4	11,231.9	1,240.1	2,221.8	11,969.9	23,746.5	30,700.8	8,292.1
(2) To Plus 3 financial system (excluding own)	518.0	965.7	1,868.9	1,016.2	1,090.0	106.7	1,590.7	100.2	1,007.7	150.0
(3) To ASEAN financial system (excluding own)	35.2	24.4	257.3	38.3	84.0	403.6	24.3	22.5	9.0	13.9
(4) To rest of world financial system	208.9	179.5	972.8	433.7	1,744.3	177.5	307.0	21.6	336.8	228.6
Expected credit loss from source entities to direct creditors (5)	515,762.5	198,627.7	39,867.6	99,064.7	9,263.1	9,797.9	5,372.5	25,277.0	10,954.7	4,654.2
Total loss to domestic GDP in 2019: ((1)+(2)+(3)+(4)+(5))/GDP	4.0	6.0	2.8	30.5	1.2	3.5	5.1	13.2	7.9	5.1
Number of G-SIBs and D-SIBs	10	6	4	5	14	3	9	3	5	5

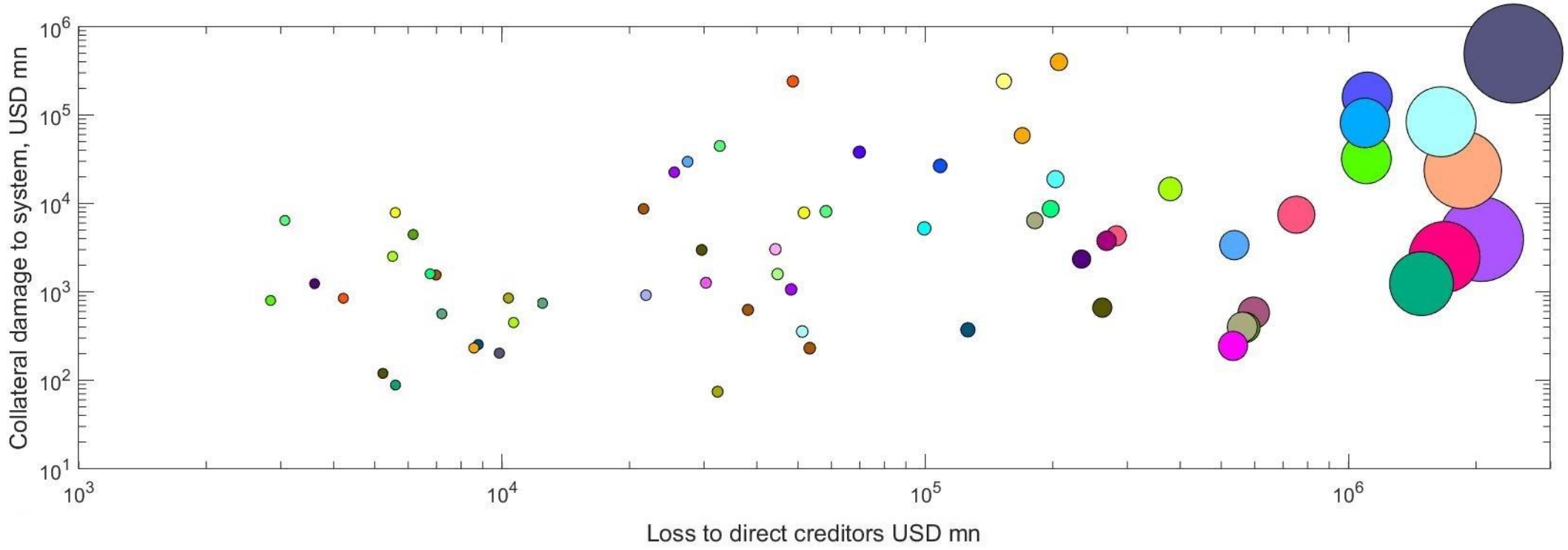
Sources: The Credit Research Initiative of National University of Singapore; and AMRO staff estimates.

Note: Data are as of October 2020.

A Lehman-sized shock (9,000 basis points) to the region's G-SIBs and D-SIBs could result in massive losses…

ASEAN+3: Loss to Direct Creditors and "Collateral Damage" of G-SIBs and D-SIBs from a 9,000 Basis Point Increase in PDs

(USD, million)



Source: The Credit Research Initiative of National University of Singapore; and AMRO staff estimates.

Note: 10^1=10, 10^2=100, 10^3=1,000, 10^4=10,000, 10^5=100,000, and 10^6=1,000,000. Each node represents a G-SIB/D-SIB in the region. The size of the node reflects the relative size of the bank's liabilities. Data are as of October 2020.

… multiples in size relative to GDP

ASEAN+3 Banks: Loss to Direct Creditors and "Collateral Damage" caused by G-SIBs and D-SIBs of a Particular Economy from a Collective 9,000 Basis Point Increase in PDs

(USD, million)

Loss Component	Financial System									
	China	Japan	Korea	Hong Kong	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Collateral damage due to contagion from source entities										
(1) To own financial system	662,177.6	1,134,902.8	32,225.9	161,423.0	17,685.5	55,108.4	119,455.2	428,075.6	277,253.1	93,495.0
(2) To Plus 3 financial system (excluding own)	1,678.0	6,705.4	9,966.9	5,018.9	4,727.2	309.7	4,628.0	340.2	3,089.0	408.2
(3) To ASEAN financial system (excluding own	106.6	134.7	2,040.8	119.1	418.0	1,942.4	70.9	68.6	27.2	41.4
(4) To rest of world financial system	697.6	1,791.7	5,840.9	1,379.5	8,530.5	609.0	870.6	63.2	1,004.9	638.5
Expected credit loss from source entities to direct creditors (5)	11,604,655.6	4,469,123.7	897,020.3	2,228,955.5	208,419.9	220,453.2	120,881.2	568,731.7	246,480.5	104,720.2
Total loss to domestic GDP in 2019: ((1)+(2)+(3)+(4)+(5))/GDP	83.3	110.5	57.6	654.8	21.4	76.3	65.3	268.0	97.1	76.1
Number of G-SIBs and D-SIBs	10	6	4	5	14	3	9	3	5	5

Sources: The Credit Research Initiative of National University of Singapore; and AMRO staff estimates.

Note: Data are as of October 2020.

Thank you.

AMRO

ASEAN +3 MACROECONOMIC RESEARCH OFFICE

Contact Us

Add: 10 Shenton Way, #15-08/9, Singapore 079117

Tel: +65 6323 9844

Email: wei.sun@amro-asia.org

Website: www.amro-asia.org