Annexes: Selected Issues

Annex 1. Solvency of Cambodian Banks: A Reverse Stress Test Exercise[81]

This Selected Issue presents a reverse stress test exercise to assess the solvency of Cambodian banks. Despite maintaining a strong capital buffer at the system level, the banking sector faces significant domestic vulnerabilities, including a rising NPL ratio. The reverse stress test results indicate that the banking system can withstand an NPL ratio of up to 18.1 percent before the capital adequacy ratio (CAR) falls to the regulatory minimum. Additionally, our follow-up scenario analyses highlight the potential capital pressure on individual banks with NPL ratios exceeding the system's threshold.

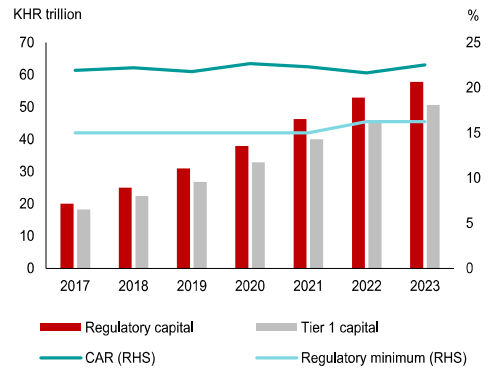
Background

1. Cambodia's banking system remains resilient overall, but it is faced with domestic vulnerabilities including subdued credit growth, weakening asset quality, and distress in the real estate sector. Thanks to the strengthened and more stringent regulatory and supervisory framework in the past decade, the banking system has built a strong capital buffer with the capital adequacy ratio (CAR) at 22.5 percent as of December 2023, the second highest in the region (Figure A1.1 and A1.2). However, the downturn in the credit cycle, combined with rising NPLs—part of which were recognized with the expiry of the regulatory forbearance—has pushed the NPL ratio to its highest level both in the past decade as well as in the region (Figure A1.3). Bank-level data shows that 49 institutions saw an increase in their NPL ratios in 2023, and 25 institutions, accounting for 41.3 percent of market share, had NPL ratios above the system's average of 5.1 percent (Figure A1.4).

Authorities' Views

2. The authorities suggest the NPL ratios should not be compared cross countries. Given that NPL rules and regulations are different across countries, especially regarding the recovery and write-off, the changes in classification, accounting rules and so on, the NPL ratios should not be compared cross countries. An example would be a country that requires banks to write off loan immediately after they are considered loss vs a country that only requires banks to write-off after one year would make the NPL ratio for the former country automatically lower than the latter.

Figure A1.1. Capital Adequacy Ratio (CAR)



Source: IMF Financial Soundness Indicators via Haver

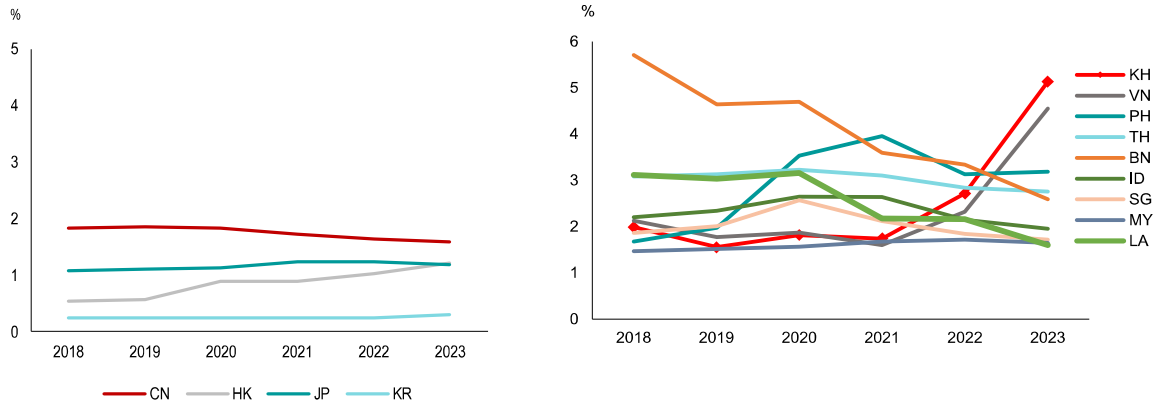
Figure A1.2. CARs in Selected ASEAN+3

Source: IMF Financial Soundness Indicators and national authorities, both via Haver Analytics
Note: 1) Data is as of end-2023. 2) BN = Brunei Darussalam; KH = Cambodia; CN = China; HK = Hong Kong, China; ID = Indonesia; JP = Japan; KR = Korea; LA = Lao PDR; MY = Malaysia; PH = the Philippines; SG = Singapore; TH = Thailand; and VN = Vietnam.

[81] Prepared by Sopheawattey San, Associate, and Heung Chun (Andrew) Tsang, Senior Economist.

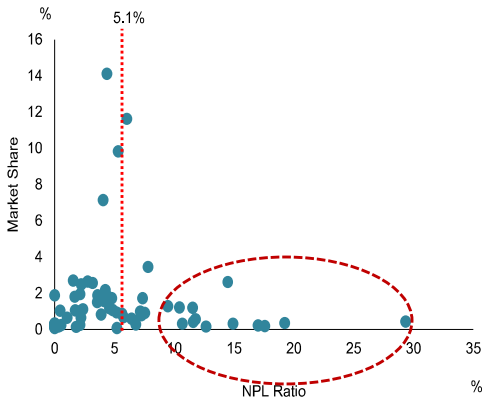
Figure A1.3. NPL Ratios in Selected ASEAN+3

(a) Plus-3 Countries **(b) ASEAN**



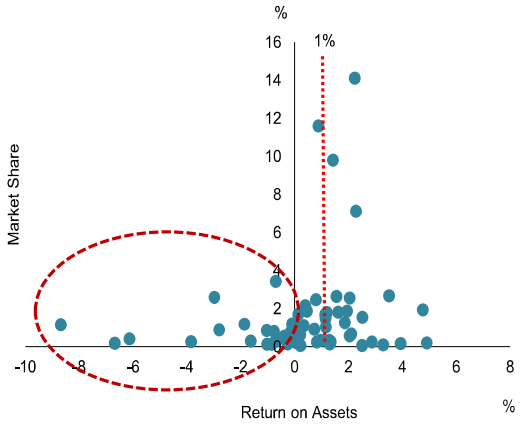
Source: IMF Financial Soundness Indicators and national authorities, both via Haver Analytics
Note: BN = Brunei Darussalam; KH = Cambodia; CN = China; HK = Hong Kong, China; ID = Indonesia; JP = Japan; KR = Korea; LA = Lao PDR; MY = Malaysia; PH = the Philippines; SG = Singapore; TH = Thailand; and VN = Vietnam. Myanmar is not included as the data are unavailable.

Figure A1.4. Cambodia: NPL Ratios and Market Shares in 2023 by Depository Institutions



Source: NBC; and AMRO staff calculations
Note: Red circle represents institutions with double-digit NPL Ratio

Figure A1.5. Cambodia: Profitability and Market Share in 2023 by Depository Institutions

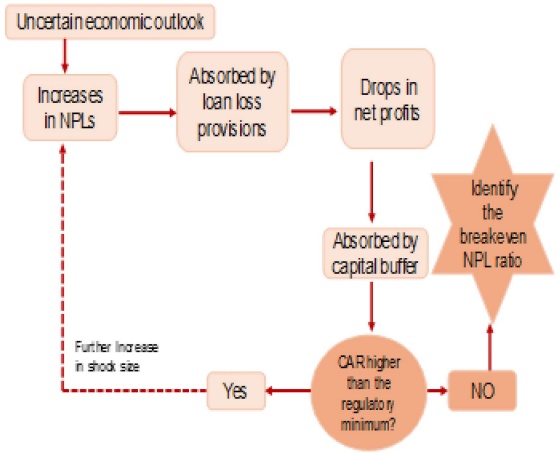


Source: NBC; and AMRO staff calculations
Note: Red Circle represents institutions with negative return on assets.

Reverse Stress Test

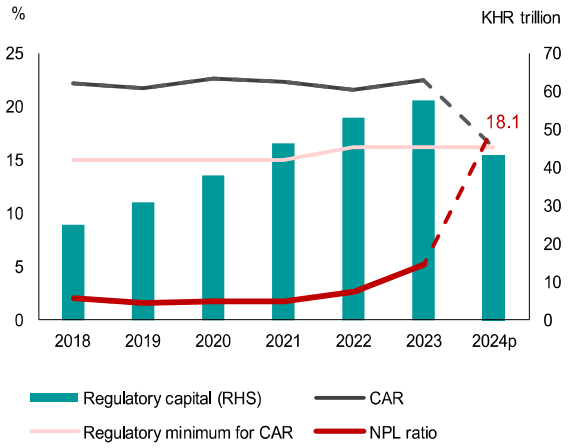
3. As credit risk heightened, the banking system's profitability had declined as of December 2023 due to weakening of asset quality, despite maintaining a relatively high capital buffer on average. Banks with lower profitability and capital buffers will be particularly affected by asset deterioration (Figure A1.5). Against this backdrop, this analysis examines how resilient the banking sector is, considering the potential impact of an increase in credit risk on its capital adequacy, by performing a reverse stress test exercise, the mechanism of which is illustrated in Figure A1.6.

Figure A1.6. Mechanism of Banks' Distress and Reverse Stress Test



Source: AMRO staff illustration

Figure A1.7. Reverse Stress Test Result



Source: NBC; and AMRO staff calculations

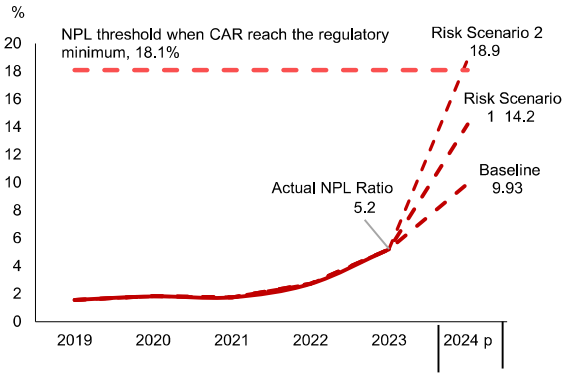
4. Our reverse stress test results suggest the banking system can withstand an NPL ratio of up to about 18 percent before the CAR falls to the regulatory minimum. We conduct a reverse stress test to quantify the threshold of non-performing loan ratio that would lower the banking system's capital to below the regulatory minimum. This exercise covers 62 depository institutions representing more than 90 percent of Cambodia's banking system assets as of December 2023. The reverse stress test estimates the breakeven NPL ratio[82] at which an increase in NPLs reduces the banking sector's CAR to the minimum regulatory requirement of 16.25 percent.[83] This test is valuable in determining the NPL ratio that allows banks to maintain their CAR above a critical distress threshold. The results indicate the banking system can withstand an NPL ratio of up to 18.1 percent before the CAR falls to the regulatory minimum (Figure A1.7).

Individual Bank's Vulnerability

5. Subsequently, to examine individual banks at risk, we take a single breakeven NPL ratio estimated from the reverse stress testing result for the banking system as a threshold benchmark. To this end, we conduct a scenario analysis on individual banks' NPL ratios in 2024 to identify banks with NPL ratios above the threshold that may face capital adequacy pressure due to declining profitability.[84] Given that NPLs in 2023 increased by 100 percent, a key assumption in our baseline scenario is that NPLs in 2024 would increase at the same rate as in 2023 i.e., double the level of 2023.[85] And that individual banks' NPLs would increase at the same rate as the industry level on average. In addition, we hypothesize two downside risk scenarios: (1) the NPLs are 50 percent higher than the baselines (i.e., triple the 2023 level of NPLs) and (2) the NPLs are 100 percent higher than the baselines (i.e., four times the 2023 level of NPLs) (Figure A1.8).

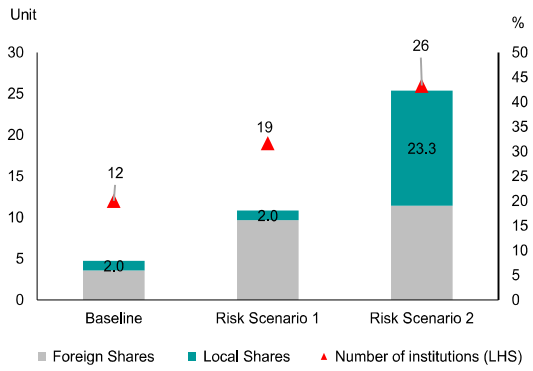
[82] We made a few more assumptions for the reverse stress test including (i) credit growth of 5 percent, (ii) risk-weighted assets growing at the same rate compared to 2023, (iii) total regulatory capital in 2024 based on total regulatory capital in 2023 and after-tax profit/loss, and (iv) loan loss provision at around 53 percent, same as 2023 Q4.
[83] The capital requirement includes the minimum CAR of 15 percent plus the capital conservation buffer of 1.25 percent.
[84] Due to data limitations, such as the absence of publicly available data on the likelihood of an increase in NPLs, the quality of NPL data, and financial soundness indicators by banks, the stress test for individual banks cannot be obtained.
[85] Meanwhile, banks' credit growth in 2024 is assumed at 5 percent.

Figure A1.8. Trajectory of NPL Ratio in the Scenario Analysis



Source: NBC; and AMRO staff calculation and projection.

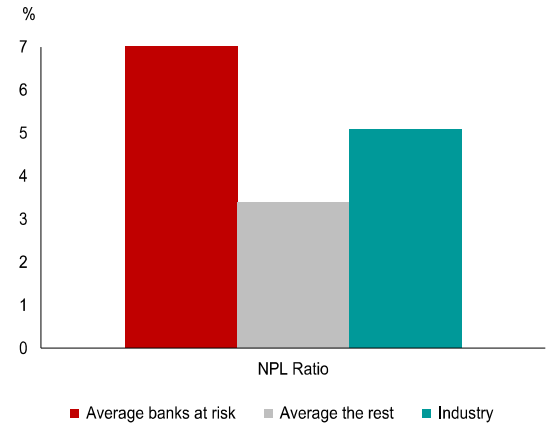
Figure A1.9. Scenario Analysis on Individual Banks Exceeding the Breakeven NPL Ratio



Source: NBC; and AMRO staff calculation and projection.

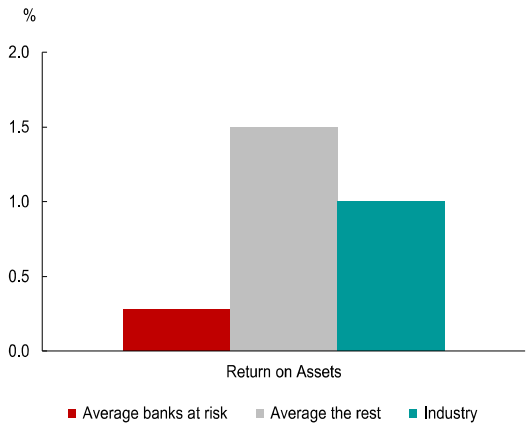
6. A follow-up scenario analysis indicates that the financial soundness of some individual banks may be at risk if the financial environment continues to be subdued, despite a strong capital buffer at the systemic level. Our simulation results summarized in Figure A1.9 indicate that in the baseline scenario, 12 banks would see their NPL ratios exceed the industry NPL ratio threshold. These 12 banks—of which eight are fully foreign-owned and four owned by local shareholders—represent about 8 percent of market share. In risk scenario 1, in which NPLs increase mildly by 50 percent from the baseline, 19 banks—accounting for 18.1 percent of market share—would exceed the threshold. In the risk scenario 2, the extreme case in which NPLs are four times the 2023 level, 26 banks—representing about 42 percent of market share—would exceed the threshold (Figure A1.10). Of these, seven local banks have a market share of 23.3 percent, while 19 fully foreign owned have a market share of 19.1 percent. By looking at the specific soundness of these 26 banks, as of December 2023, we observed their average NPL ratio is relatively higher than the rest of the banks while their return on assets is lower (Figure A1.10 and A1.11). In terms of the provisioning coverage ratio, which is the ratio of provision to gross NPLs, on average, banks at risk have lower coverage than the rest of the banks as well as the industry level (Figure A1.12).

Figure A1.10. NPL Ratios of Banks in 2023 at Risk under Risk Scenario 2



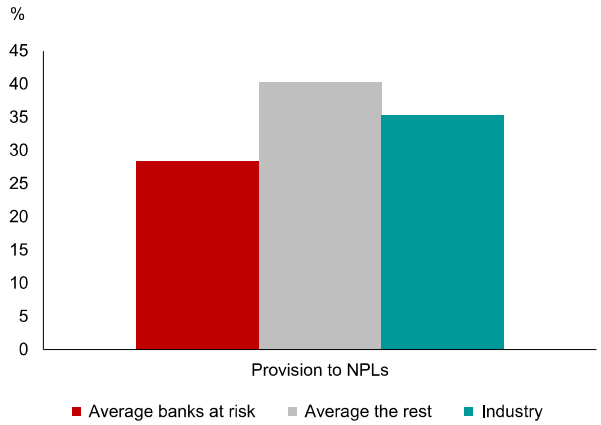
Source: NBC; and AMRO staff calculation and projection.

Figure A1.11. Return on Assets of Banks in 2023 at Risk Under Risk Scenario 2



Source: NBC; and AMRO staff calculation and projection.
Note: Return on Asset= NPBT/Total Assets

Figure A1.12. Provision Coverage Ratio of Banks in 2023 at Risk Under Risk Scenario 2



Source: NBC; and AMRO staff calculation and projection.
Note: Provision is taken from provision expense in P&L statement.

7. The reverse stress test results indicate some individual banks are vulnerable, and flag the need for more in-depth supervisory risk reviews. However, there are data limitations and it is possible the analysis has room to improve, particularly in the case of individual banks. Ideally, this analysis should complement authorities' stress tests, given their greater access to supervisory information and data. Despite its limitations, this analysis does flag the need for more in-depth supervisory risk reviews, including on-site inspections or asset quality reviews.