

Financial Institution Soundness and Resilience

THE BANKING SECTOR

Strong liquidity position enabled banks to support financial intermediation and the implementation of various relief measures

The liquidity position of banks has remained healthy despite the deferment of close to 90% of retail loan repayments under the automatic moratorium.¹ This has been supported by the strong initial buffers of banks as well as higher deposit growth from precautionary cash holdings, particularly among individual depositors in the second quarter (Chart 2.1). Along with the reduction in the Statutory Reserve Requirement (SRR) by 100 basis points (bps) in March and the additional SRR flexibilities which released more liquidity into the banking system, banks consequently had less need for interbank funding and had not resorted to the flexibility granted for banks to operate below the minimum Liquidity Coverage Ratio (LCR) of 100%. Throughout the first half of 2020, the banking system LCR remained around 140% or higher (December 2019: 149.1%) (Chart 2.2). Funding conditions in the banking system also remained stable with the loan-to-fund ratio at 82.0% (December 2019: 83.2%) (Chart 2.3). All banks were well-positioned to meet the minimum Net Stable Funding Ratio (NSFR) requirement of 80% which came into effect in July 2020.

Chart 2.1: Banking System – Contribution to Growth in Deposits Accepted

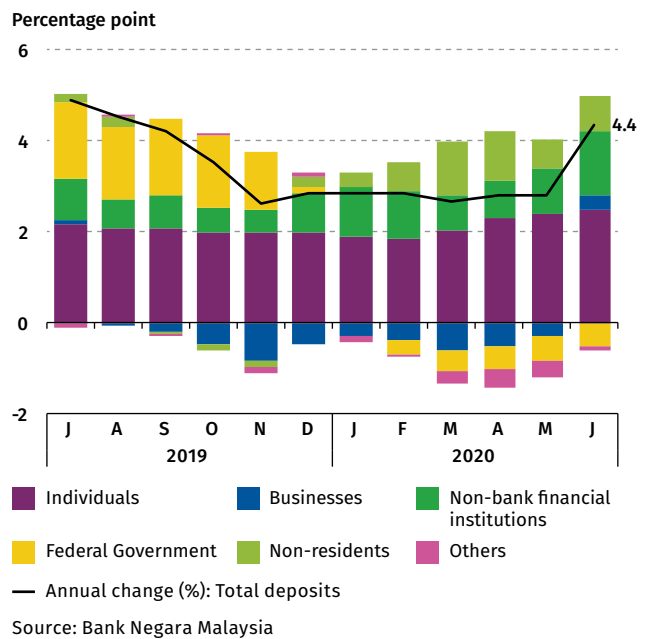
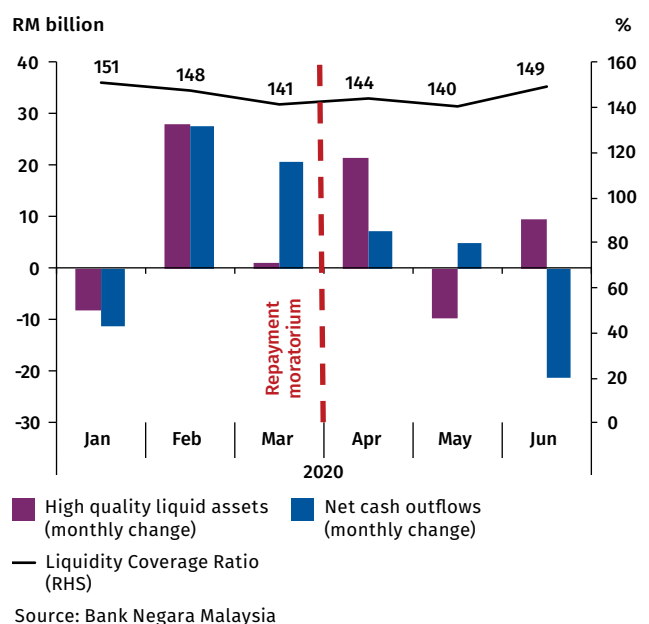
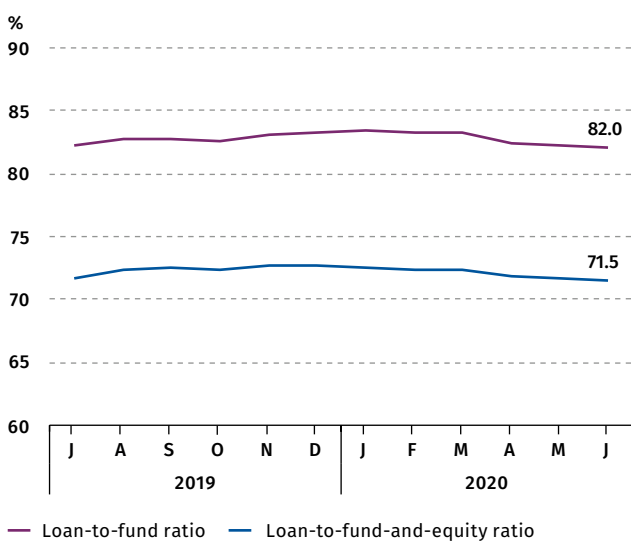


Chart 2.2: Banking System – Liquidity Coverage Ratio, High Quality Liquid Assets and Net Cash Outflows



¹ Malaysia was among the first and only few countries in the world to implement an automatic deferment of loan/financing repayments for eligible borrowers.

Chart 2.3: Banking System – Loan-to-Fund Ratio and Loan-to-Fund-and-Equity Ratio



Source: Bank Negara Malaysia

Risks posed by external and cross-currency funding remained manageable

Risks from external debt exposures of banks continue to be manageable given their low dependence on external funding which has remained broadly stable below 10% of total funding over the years. Most of the increase in banks' external debt of RM22.9 billion in 1H 2020 was attributable to increased intragroup borrowings by foreign banks in the Labuan International Business and Financial Centre (LIBFC) in line with their 'out-out'

business activities (Chart 2.4). While some onshore banks² increased cross-currency borrowings in 1Q 2020 to manage short-term liquidity needs from maturing deposits and demand for domestic FCY loans, this has since been pared back in 2Q 2020 amid lower domestic funding costs. More than 60% of banks' external exposures continue to be in the form of intragroup placements and long-term debt securities, which are less susceptible to sudden withdrawal or rollover risk (Chart 2.5). Banks' foreign exchange net open position (FX NOP) also remained below levels recorded in recent history (5-year average: 5.6%) (Chart 2.6). It has, however, risen from end-2019 levels amid an increase in banks' risk appetite particularly after the earlier stress in the USD funding market subsided following significant liquidity injections by the Federal Reserve to ease market strains. Banks continued to maintain steady holdings of liquid FCY assets which are sufficient to cover more than three times their FCY external 'debt-at-risk' (Chart 2.7).³

Banks' cost of funds continued to be on a declining trend amid strong pass-through of the successive Overnight Policy Rate (OPR) cuts to deposit and money market rates (Chart 2.8). The shift towards more liquid and shorter-term deposits has also kept the costs of funds relatively low. Greater uncertainty among households and businesses has led to a preference for holding cash in more liquid current and savings accounts (CASA), while competition among banks for longer-dated fixed deposits has also eased on expectations of further OPR cuts. (Chart 2.9). In the near term, banks' funding costs are expected to remain low as banks gradually reprice deposits to incorporate the most recent OPR cuts.

² Refers to domestic banking groups (DBGs) and locally-incorporated foreign banks (LIFBs).

³ Banks' external 'debt-at-risk' comprises financial institutions' deposits, interbank borrowings and short-term loans from unrelated non-resident counterparties which are considered more susceptible to sudden withdrawal shocks.

Chart 2.4: Banks' External Debt – by Instrument

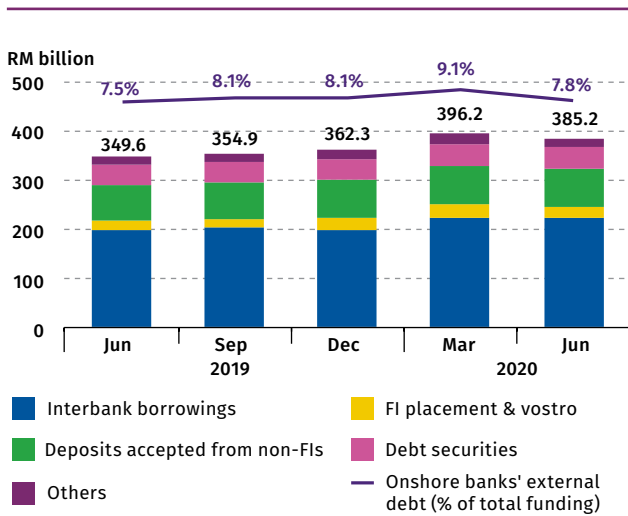


Chart 2.5: Banks' External Debt – by Type of Exposure and Instrument

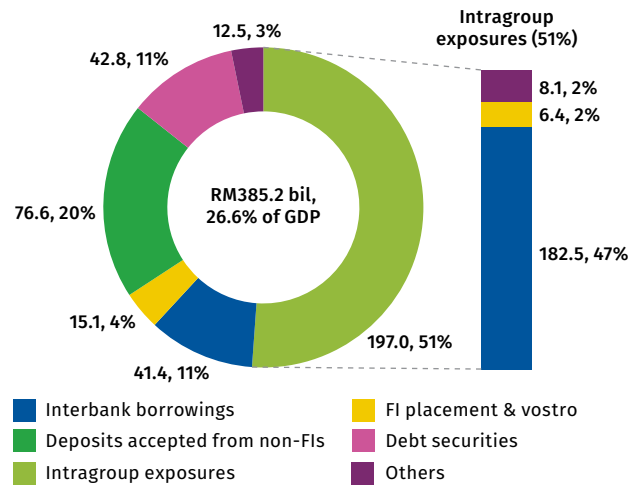


Chart 2.6: Banking System – FX and USD Net Open Positions as Percentage of Capital

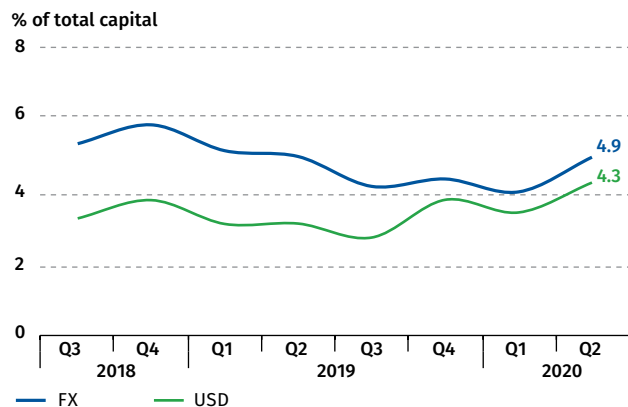
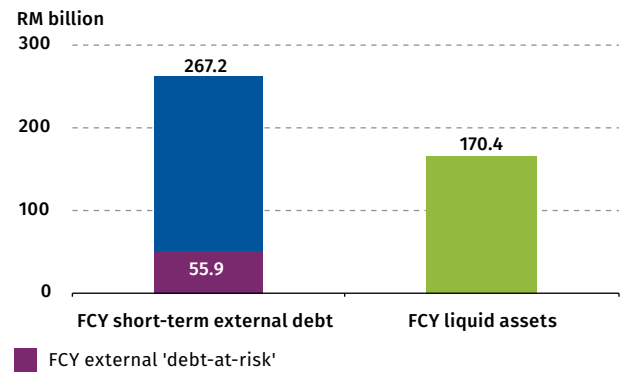
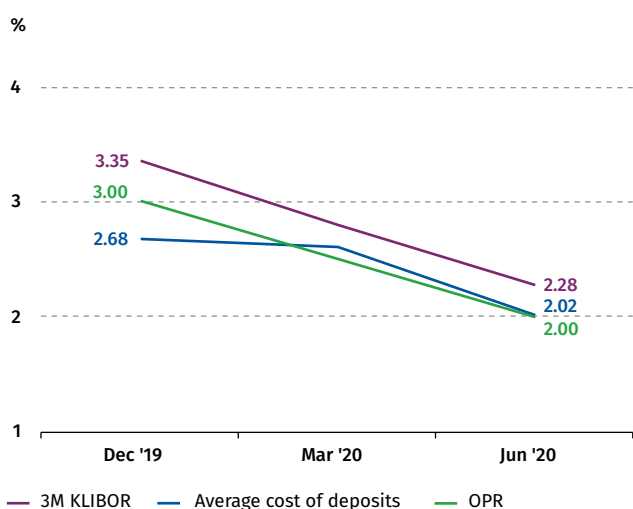


Chart 2.7: Banking System – FCY External 'Debt-at-Risk' and Liquid Assets



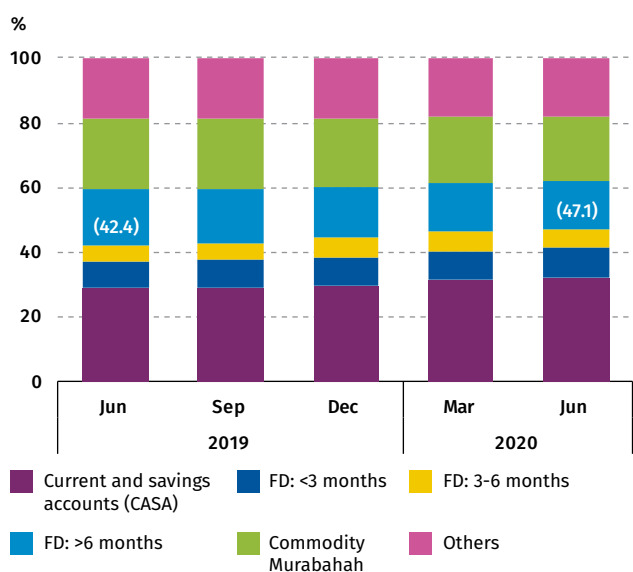
Note: 1. Banks' external debt in this context refers to external debt of DBGs, LIFBs, and LIBFC banks
 2. Banking system or onshore banks refer to only DBGs and LIFBs
 3. Liquid assets comprise cash and cash equivalents, unencumbered debt securities held and interbank placements
 Source: Bank Negara Malaysia

Chart 2.8: Banking System – Average Cost of Deposits, Kuala Lumpur Interbank Offered Rate (KLIBOR) and Overnight Policy Rate (OPR)



Source: Bank Negara Malaysia

Chart 2.9: Banking System – Composition of Deposits by Type and Original Maturity



Note: (...) refers to the total share of CASA and fixed deposits (FD) with original maturity of up to 6 months

Source: Bank Negara Malaysia

Impairments remained low, but banks are cautious on the credit risk outlook

In April 2020, an automatic repayment moratorium was put in place for retail and SME loans that were performing prior to that date. This has kept banking system impairments low at 1.5% of total loans (2019: 1.5%; 5-year average: 1.6%) (Chart 2.10). At the same time, continuing debt recovery efforts on defaulted loans have also helped to reduce outstanding impairments.

A key challenge for banks in monitoring credit risk developments during this period has been the absence of borrowers' repayment information due to the extensive coverage of the loan moratorium. In response, banks have taken proactive measures to assess and manage risks by (i) engaging borrowers more directly on their recovery prospects; (ii) increasing the use of data analytics and alternative sources of information (such as facility utilisation rates, cash conversion cycles, and operating account balances) to establish the condition of borrowers; and (iii) working with credit reporting agencies to identify early-warning indicators. This has enabled banks to identify loans with higher credit risks and pre-emptively build up provisions against future potential losses to ensure their continued resilience. Provisions for loans classified as Stage 2⁴ under MFRS 9 increased by RM1.7 billion in the first half of 2020 (June 2020: +27.9% annual growth; 2019: -5.9%), driven by businesses most affected by the pandemic.⁵ Higher overall provisions set aside by banks in 1H 2020 (+RM2.7 billion to RM24.6 billion as at end-June 2020) also reflected banks' consideration of forward-looking information that takes into account the considerable uncertainty over the recovery path. While asset quality can be expected to deteriorate, the recovery in business activities amid continued fiscal and financial support to businesses and households will mitigate risks of defaults. Importantly, impairment levels have stabilised at historically low levels in recent years due to strengthened underwriting standards. This, together with prudent provisioning practices observed by banks, provides a strong starting position for banks to weather the expected rise in impairments in the period ahead.

⁴ Stage 2 loans refer to underperforming loans, for which banks are required to set aside provisions based on lifetime expected losses.
⁵ For example, construction, manufacturing, wholesale and retail, hotels and restaurants sectors.

Despite downward pressure on earnings, banks maintained healthy capital buffers

Banks reported a marked decline in earnings from domestic banking activities during the first half of the year (Chart 2.11), weighed down by further margin compression and higher provisions for credit losses. Annualised credit costs as a share of total outstanding loans⁶ rose significantly from the low levels over the past decade to 56 bps (average for 2010-2019: 20 bps) – a level last seen during the 2008 Global Financial Crisis. Banks were also impacted by a one-off contract modification loss due to the waiver of additional interest charges for hire-purchase loans and fixed rate Islamic financing under the repayment moratorium measures. This further compressed narrowing margins from successive OPR cuts (Chart 2.12).

Trading and investment income, however, provided some support to profits as banks recorded gains from the sale of debt securities and fair value changes amid declining yields (Chart 2.13). By end-June 2020 however, banks had increased their holdings of government bonds to nearly half of the treasury portfolio (June 2020: 49%; December 2019: 42%; 2017-2019 average: 43%) amid higher issuances, additional liquidity from the SRR-related measures, and slower lending growth. Interest rate risks in the banking book correspondingly increased to 5.5% of total capital (2019: 4.4%), but remained well within prudent limits observed by individual banks. Measures to improve cost efficiency also continue to be pursued by banks to support profitability, including reviewing the timing of non-critical expenditures, renegotiating vendor contracts and accelerating ongoing digitisation efforts.

Market valuations of banks as measured by the median price-to-book (P/B) ratio have fallen further since 2019, reflecting the weaker

macroeconomic outlook and earnings expectations. Bank-specific factors and more cautious investor sentiment also contributed to a fairly wide dispersion of P/B ratios across banks, with several banks reporting P/B ratios below one. Nonetheless, Malaysian banks' returns on equity and assets remain broadly in line with other banks in the region, and have declined to a lesser extent so far this year (Charts 2.14 and 2.15). The strong financial position of banks will also provide some support to earnings and preserve their ability to raise capital at lower costs from the market to support financial intermediation activities.

Limited spillover risks arising from banks' overseas operations despite the challenging economic environment

The overseas operations⁷ of domestic banking groups (DBGs) also experienced a decline in profitability for the first half of 2020, as banks in the region were similarly affected by slower economic activity as a result of COVID-19 containment measures and a deterioration in asset quality (Chart 2.16). Risks from the overseas operations of DBGs are likely to be manageable, as banks' overseas credit exposures to sectors directly affected by the pandemic are relatively small, ranging between 0.1%-5.3% of overall group exposures. Major overseas subsidiaries also continue to maintain relatively high levels of capital, which serve as strong buffers against potential credit losses. This will limit the need for capital support from the domestic parent banks. Based on stress tests conducted by DBGs on their major overseas operations, most foreign subsidiaries have sufficient capital to withstand severe shocks amid the COVID-19 pandemic. Overseas operations of the DBGs also continue to be largely funded by local currency deposits, with liquidity ratios remaining above local regulatory requirements and internal targets (Chart 2.17).

⁶ Excluding loans from domestic banks' overseas operations.

⁷ Refers to DBGs' material offices (branches and subsidiaries) operating outside of Malaysia. Cumulatively, DBGs have presence in 14 overseas jurisdictions, with major operations in Singapore, Indonesia, Thailand and Hong Kong SAR.

Chart 2.10: Banking System – Gross Impaired Loans Ratio

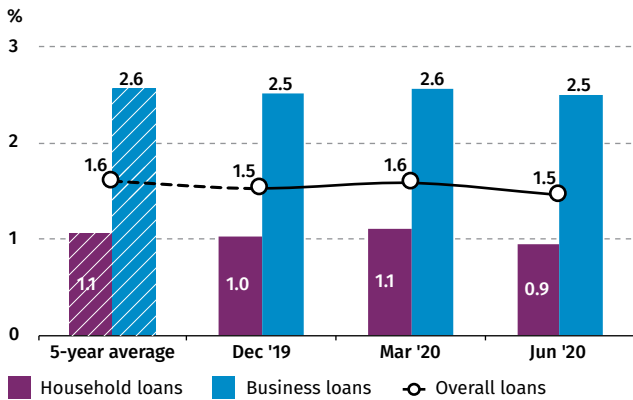


Chart 2.11: Banking System – Profitability

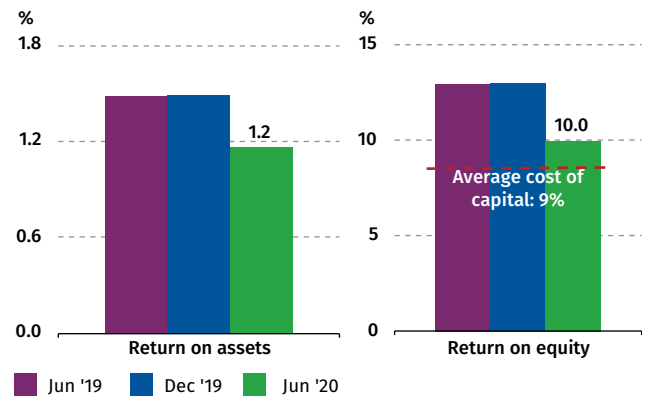


Chart 2.12: Banking System – Interest Margin

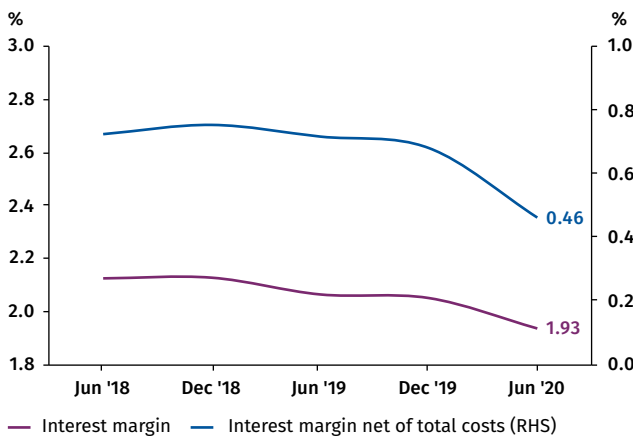


Chart 2.13: Banking System – Income, Cost and Profit before Tax

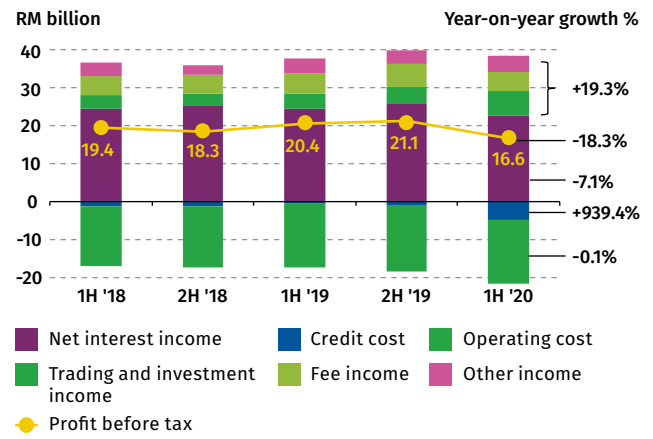


Chart 2.14: Banks' Return on Assets – Cross-country Comparison

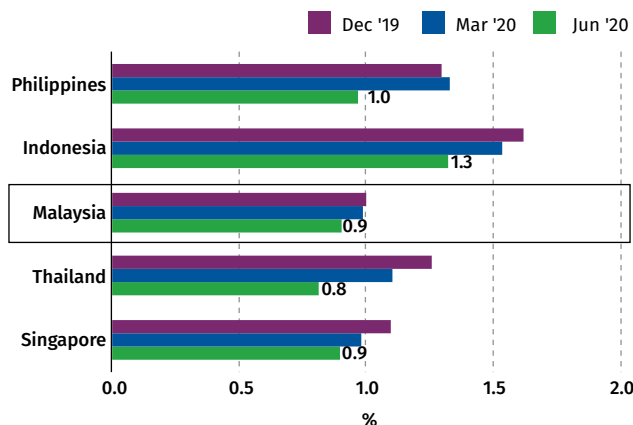
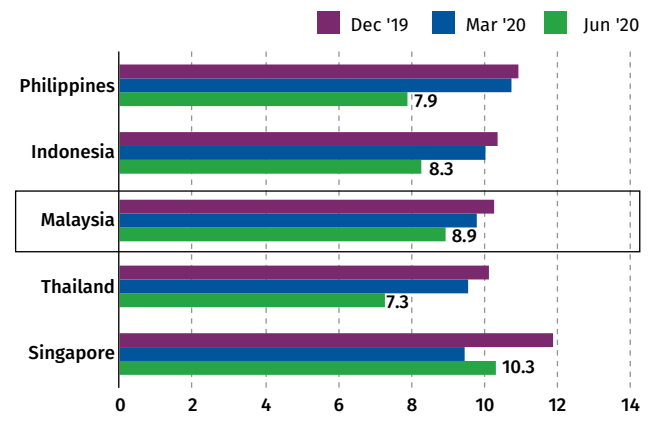


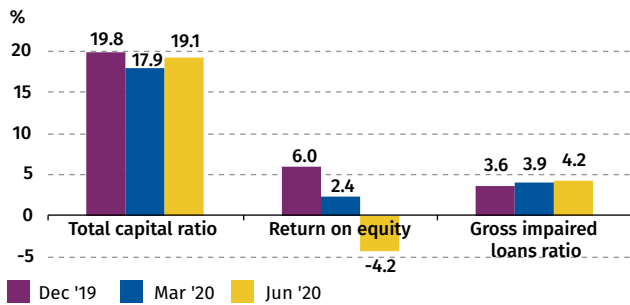
Chart 2.15: Banks' Return on Equity – Cross-country Comparison



Note: 1. The average cost of capital for Malaysian banks refers to the average expected annual stock returns for all listed banks estimated using a Capital Asset Pricing Model
 2. Total costs refer to impairment provisions and operating costs
 3. Year-on-year growth computed based on figures for 1H 2019 and 1H 2020
 4. Cross-country comparisons refer to median figures reported by selected listed banks in each jurisdiction

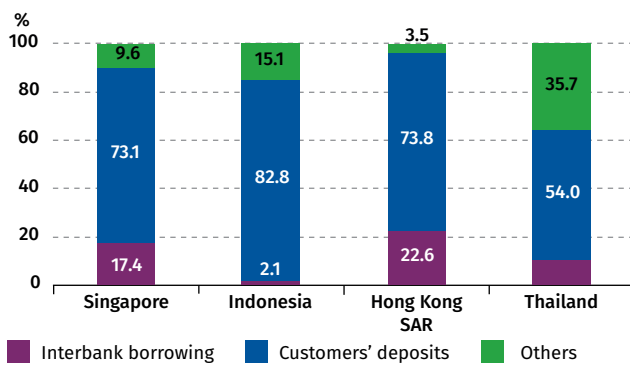
Source: Bank Negara Malaysia and Bloomberg

Chart 2.16: Banking System – Key Financial Indicators of Overseas Operations



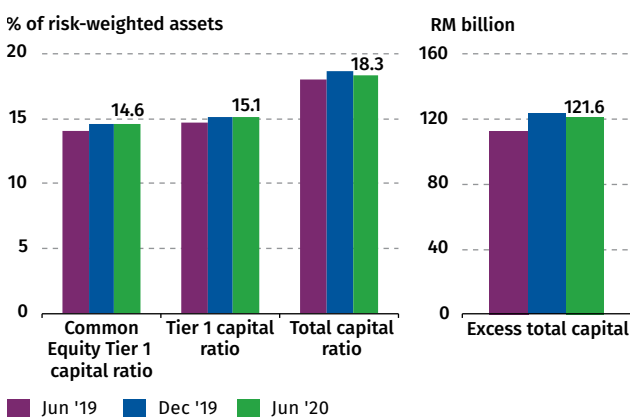
Note: The average key financial indicators are weighted by the asset size of selected overseas operations
 Source: Bank Negara Malaysia

Chart 2.17: Banking System – Funding Profile of Major Overseas Operations



Source: Bank Negara Malaysia

Chart 2.18: Banking System – Capital Ratios



Note: Excess total capital refers to total capital above the regulatory minimum, which includes the capital conservation buffer requirement (2.5%) and bank-specific higher minimum requirements
 Source: Bank Negara Malaysia

All banks remained well-capitalised throughout the first half of 2020, with aggregate capital buffers⁸ amounting to RM121.6 billion as at June 2020 (Chart 2.18). In anticipation of the more challenging economic outlook, banks are shoring up their buffers, either through new capital issuances or dividend reinvestment plans. Most banks have also reduced or deferred dividend payouts to shareholders.

As part of an annual cycle, the Bank completed its latest assessment on domestic systemically important banks (D-SIBs) based on end-2019 data submissions. The three banking groups designated as D-SIBs remain unchanged from the list published on 5 February 2020 (Table 2.1).⁹ The identification of D-SIBs is based on an assessment methodology that combines an indicator-based measurement approach with supervisory judgment which considers factors not fully captured under the quantitative-based assessment. The designated D-SIBs already meet the higher loss absorbency (HLA) requirements that D-SIBs must comply with to reduce the probability of distress or failure during periods of stress.

Table 2.1: D-SIBs HLA Requirement

D-SIBs	HLA Requirement (% of risk-weighted assets)
Malayan Banking Berhad	1.0
CIMB Group Holdings Berhad	
Public Bank Berhad	0.5

Source: Bank Negara Malaysia

Underpinned by healthy buffers, the banking system continues to be well-positioned to support credit flows to the real sector as the economy gradually begins to recover. Banking system loans recorded an annual growth of 4.1% as of June 2020, mainly driven by growth in outstanding business loans in the wholesale and retail trade, hotels and restaurants, and manufacturing sectors. Following the gradual relaxation of the MCO, high disbursements for working capital needs were recorded in June. There was also strong demand for loans under the Special Relief Facility (SRF) and other targeted funds for SMEs established by the Bank. Financing conditions have been further supported by lower borrowing costs following recent monetary policy easing. In contrast, demand for financing by households was generally weaker reflecting more uncertain income and employment prospects. Banks are expecting some recovery in household loan growth in the second half of 2020 amid low borrowing costs and improving labour market conditions.

⁸ Refer to capital held in excess of regulatory minimum, which includes the capital conservation buffer (2.5%) and bank-specific requirements.

⁹ Please refer to https://www.bnm.gov.my/index.php?ch=en_press&pg=en_press&ac=4988&lang=en.

THE INSURANCE AND TAKAFUL SECTOR

Overall profitability declined for the insurance and takaful sector amid the challenging operating environment

The financial impact of COVID-19 has mainly affected insurers and takaful operators (ITOs) through the investment channel and lower new business. On aggregate, insurance and takaful funds recorded a decline in profitability in the first half of 2020. This was attributed to the life insurance and family takaful funds, which recorded unrealised losses from equity investments and a decline in new premiums amid movement restrictions during the MCO (Charts 2.19 and 2.20). However, higher gains from investments in bonds provided some support to overall investment performance and profits. The profitability of general insurance and takaful funds meanwhile improved slightly despite lower premium growth (Charts 2.21 and 2.22).

The underwriting performance of life insurance and family takaful funds improved during the period due to lower benefit payouts on medical and health policies in line with the deferment of elective procedures by both hospitals and policyholders. Policy surrenders and lapses were also lower during 1H 2020 due in part to the temporary relief measures. This included options for policyholders to defer the payment of premiums and avail themselves of premium holidays without affecting their coverage.¹⁰ The impact of these measures on ITOs' profitability has been manageable due to the relatively short deferment period and a large share of life/family takaful policies already having such flexibilities built into the policy features. General ITOs meanwhile recorded higher underwriting profits from lower motor claims paid during the MCO and CMCO periods as fewer vehicles were on the road and repair workshops were closed.

¹⁰ Premium deferment refers to the temporary relief measure where customers affected by COVID-19 can defer payments of life insurance premiums and family takaful contributions by three months between April and December 2020. Premium holiday refers to continued insurance/takaful coverage despite an absence of premium payments and applies to products with the premium holiday feature already in place such as investment-linked products. This is allowed as long as the investment value in the unit fund remains sufficient to meet the necessary insurance cost during the holiday period.

In response to the COVID-19 pandemic, ITOs have revised their plans to re-price medical and health insurance policies/takaful certificates in an effort to reduce the financial burden of policyholders/takaful participants and preserve their coverage. The revised plans include deferring planned re-pricing for the year, providing refunds on any premium increase until end-2020, and extending the deferral of premiums to protect coverage. A number of ITOs have not re-priced medical and health insurance policies that have sustained underwriting losses in recent years despite rising medical cost pressures. However, the impact of further delaying planned re-pricing exercises is expected to be manageable given the healthy capital positions and overall profitability of ITOs (refer to the Box Article 'Measures to Mitigate the Impact of the COVID-19 Pandemic And Preserve Financial Stability' for further details on insurance and takaful relief measures).

Insurance and takaful sector remained well-capitalised

The aggregate capital adequacy ratio (CAR) of the insurance and takaful sector remained well above the regulatory minimum (Chart 2.23). In March 2020, the Bank implemented revisions to the stress parameters used for the computation of interest/profit rate capital charge under the Risk-based Capital (RBC) Framework for ITOs. The revised parameters better reflect prevailing market conditions by refining the sensitivity of ITOs' balance sheet to interest rate movements. This aims to ensure that the risk measures within the RBC Framework continue to provide an appropriate basis for the computation of capital levels that promotes the safety and soundness of ITOs under a range of stress conditions. These changes resulted in improvements to ITOs' capital positions, mostly among life insurers and family takaful operators.

Based on the Bank's sensitivity analysis, life insurers are expected to remain solvent should interest rates decline further, with aggregate industry CAR remaining comfortably above the regulatory minimum.¹¹ The healthy overall underwriting performance of most ITOs, along with a gradual improvement in new business growth in tandem with the economic recovery, will further support the strong capitalisation of ITOs.

¹¹ Refer to the Information Box 'Assessing the Impact of Declining Interest Rates on Life Insurers' Solvency Positions' in FSR 2H 2019 for further details on the methodology.

Chart 2.19: Life Insurance and Family Takaful Fund – Composition of Income and Outgo

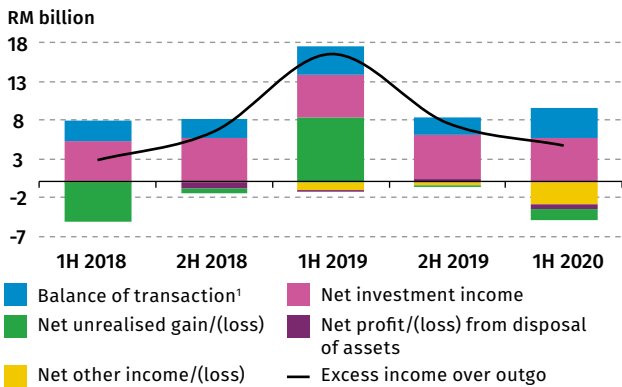


Chart 2.20: Life Insurance and Family Takaful Sector – New Business Premium Growth and Product Composition

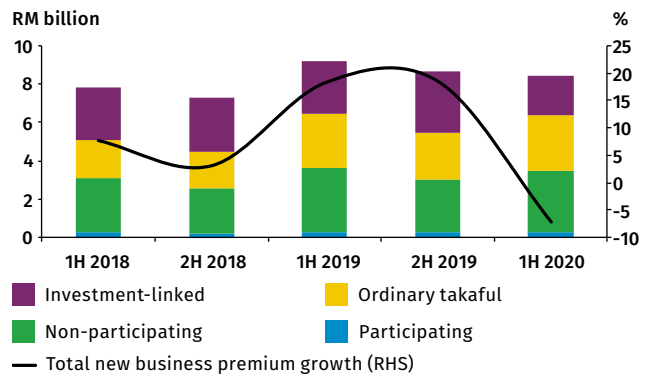


Chart 2.21: General Insurance and Takaful Fund – Composition of Operating Profits

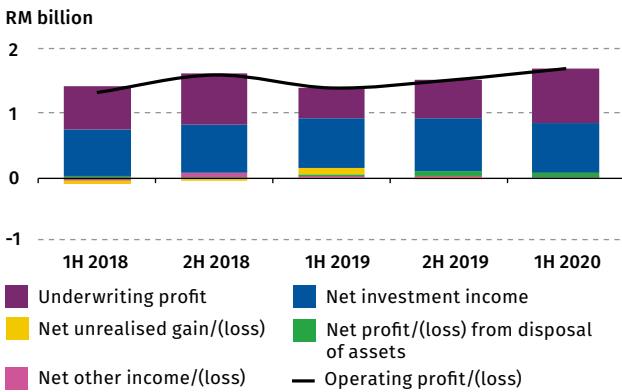


Chart 2.22: General Insurance and Takaful Sector – Gross Direct Premium Growth and Product Composition

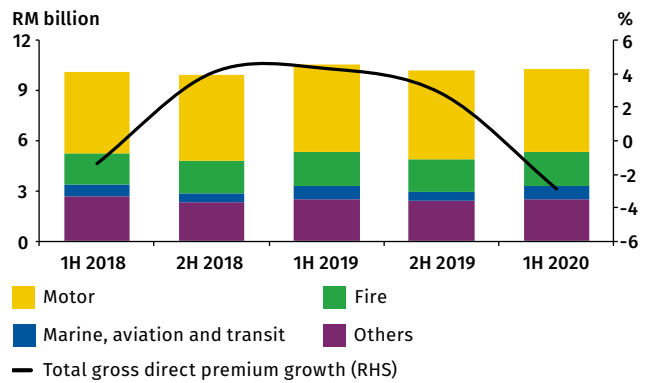
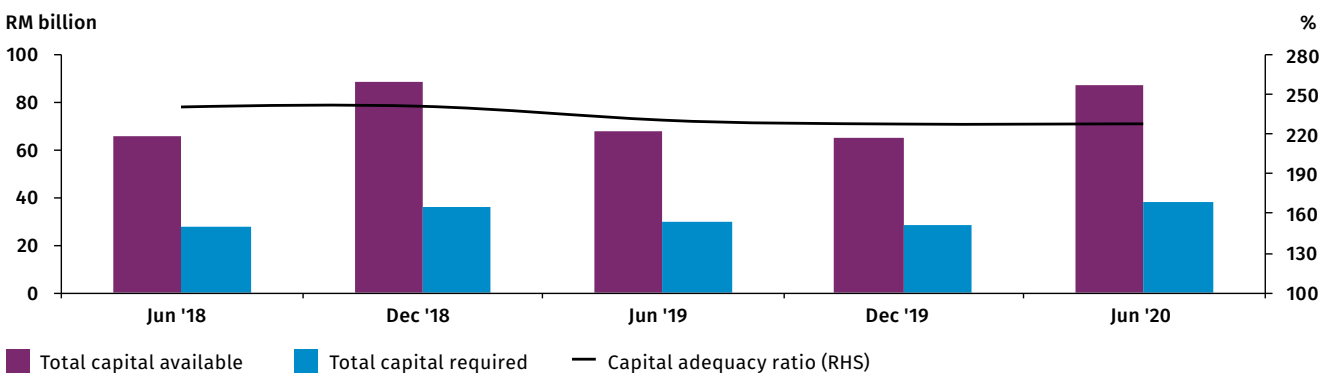


Chart 2.23: Insurance and Takaful Sector – Capital Adequacy Ratio



¹Excess of net premium after deducting benefit payouts, agency remuneration and management expenses

Source: Bank Negara Malaysia

ASSESSING THE RESILIENCE OF FINANCIAL INSTITUTIONS

Stress testing is an integral component of the Bank's financial stability framework, used to assess and manage risks to financial stability. The Bank's annual stress tests adopt both a top-down and bottom-up approach¹² to stress testing to detect and assess vulnerabilities in individual financial institutions and the broader financial system. Typically, the stress tests are designed to capture adverse scenarios that incorporate extreme shocks that are plausible but have a low probability of occurring. This allows the Bank to assess the ability of financial institutions to withstand large shocks, and determine how this interacts with, and could affect, the broader financial system.

The initial economic disruptions from COVID-19 were more severe than that assumed in the Bank's macro stress test released earlier this year. However, with the gradual improvement in economic activities since May, the overall impact on financial institutions is now expected to fall within the range of outcomes anticipated under the adverse scenarios in the earlier stress test. Given that the current environment already reflects stressed conditions, applying further shocks to these adverse scenarios would not provide useful information to assess the resilience and capacity of the banking system to support the economy at the present time.

Therefore, the Bank's latest macro stress test examines the potential losses to the banking system from the assumed impact of a recovery

path that is derived with reference to the Bank's updated macroeconomic outlook.¹³ Under this scenario, growth is assumed to have troughed in 2Q 2020. With the re-opening of the economy in early May, the economy is then assumed to gradually recover in the latter half of 2020 and register a rebound in 2021 amid global growth recovery and aided by the series of stimulus and financial relief measures introduced by the Government and the Bank. While the scenario does not specifically consider the reintroduction of a nationwide lockdown, it should, however, be noted that modelled impacts from the economic variables applied (such as the impact on household and business defaults and the corresponding credit costs) have retained some degree of conservatism (further elaborated in the information boxes below). This is consistent with the aim of assessing if banks can withstand stress conditions that are not only more plausible, but also potentially even more severe.

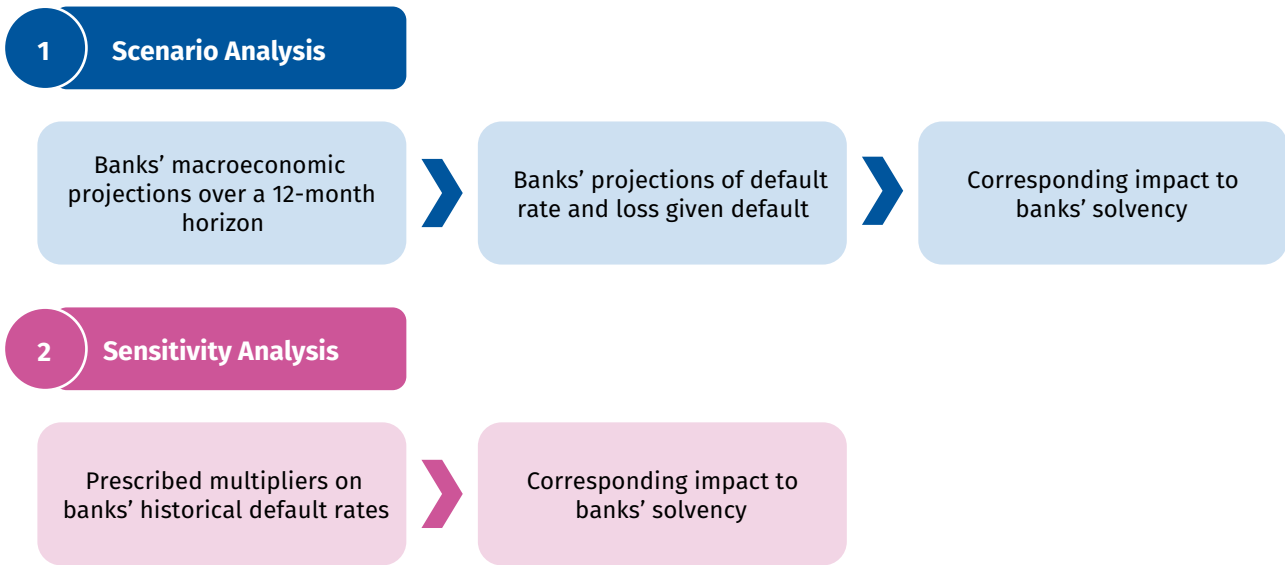
A bottom-up approach was also used to provide an additional perspective on individual banks' resilience. This built on banks' own updated internal stress tests¹⁴ and historical default experience. The internal stress tests were further subjected to a sensitivity analysis conducted on the credit loss estimates projected by individual banks based on factors prescribed by the Bank (Diagram 2.1).

¹² For details of the Bank's approach to stress testing, refer to the box article 'Macroprudential and Microprudential Applications of Stress Testing in Malaysia' in the BNM Financial Stability and Payment Systems Report 2012.

¹³ For details of the Bank's macroeconomic outlook, refer to the BNM Quarterly Bulletin 2Q 2020.

¹⁴ Used by banks to inform the setting of internal capital targets as part of the Internal Capital Adequacy Assessment Process (ICAAP).

Diagram 2.1: Overview of the Bottom-up Stress Test Exercise



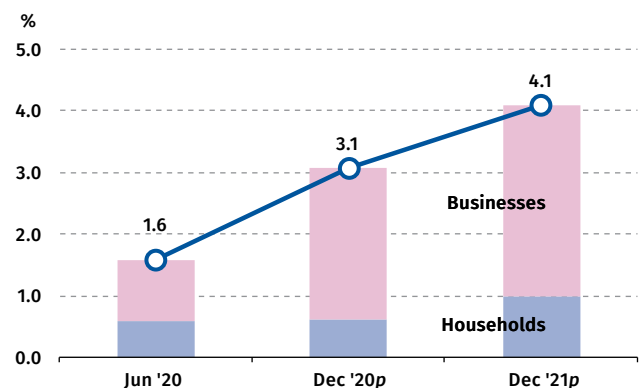
Source: Bank Negara Malaysia

Results from the Bank’s stress tests affirm the resilience of banks to an expected increase in credit losses under more adverse economic conditions

Under the assumed scenario of economic and financial shocks arising from the pandemic, overall impairments are projected to rise above 4% of loans by end-2021, mainly driven by higher business impairments (Chart 2.24). This takes into account the effects of the blanket moratorium implemented in April and subsequent targeted repayment assistance for individuals that was announced by banks in August. Business impairments are expected to be driven by defaults of maturing bullet repayments of firms operating in vulnerable sectors, mostly in the services industry which is expected to experience a slower recovery, as well as exposures to several large borrower groups with weaker financials (Diagram 2.2).¹⁵ Meanwhile, household loan impairments are projected to double,¹⁶ albeit from historically low levels. Higher household

impairments¹⁷ are expected to emerge in the second half of 2021 given the extended repayment assistance programmes that will remain in place through 1Q 2021 for individuals who have experienced a loss in income (Diagram 2.3).

Chart 2.24: Macro Simulation: Banking System – Impaired Loans Ratio



p: projected

Source: Bank Negara Malaysia

¹⁵ For details of the estimation methodology, refer to the Information Box 'Forecasting Business Impairments: Two-pronged Approach'.

¹⁶ With no assistance measures, some countries have experienced up to a quadrupling level of impairments during a crisis. ECB (2013) "What Matters in Addition to the Economic Cycle?" and IMF (2019) "The Dynamics of Non-Performing Loans During Bank Crises".

¹⁷ For details of the estimation methodology, refer to the Information Box 'Forecasting Households' Time to Default – Enhancements to the Financial Margin Framework'.

Diagram 2.2: Macro Simulation: Business Sector – Impairment Profile

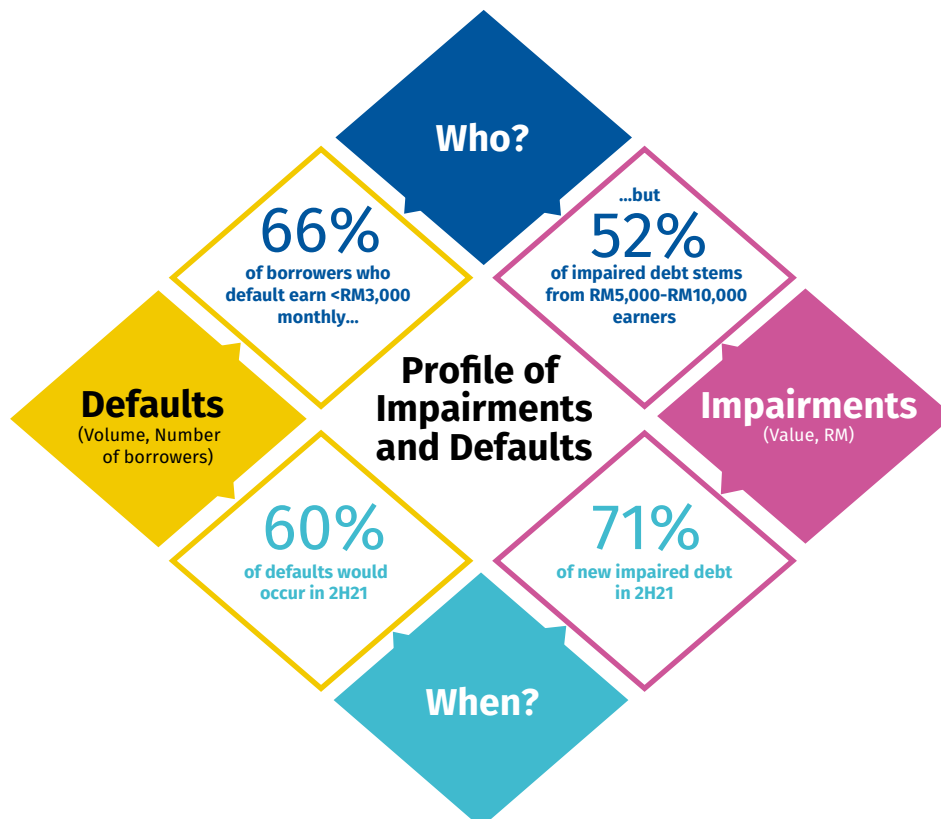


Source: Bank Negara Malaysia

Overall, credit costs to banks could rise to RM29 billion (1.4% of total loans) over 2020 and 2021 (Diagram 2.4). These projections assume conservative estimates of the share of loans under bespoke targeted repayment assistance (mainly for businesses) based on restructuring and rescheduling (R&R) trends observed at the onset of the pandemic.¹⁸ With uncertain conditions persisting, banks have been much more proactive in extending repayment assistance, as seen in recent months. This was not taken into account in the simulations. Since July, the number of businesses receiving repayment assistance from banks has increased seven-fold. This would improve debt serviceability and mitigate credit losses.

In anticipation of higher credit losses, banks have been shoring up their buffers, adding RM2.7 billion to provisions in 1H 2020. At an individual bank level, additional provisions by banks have already risen to an average of 16% of banks' projected stressed credit

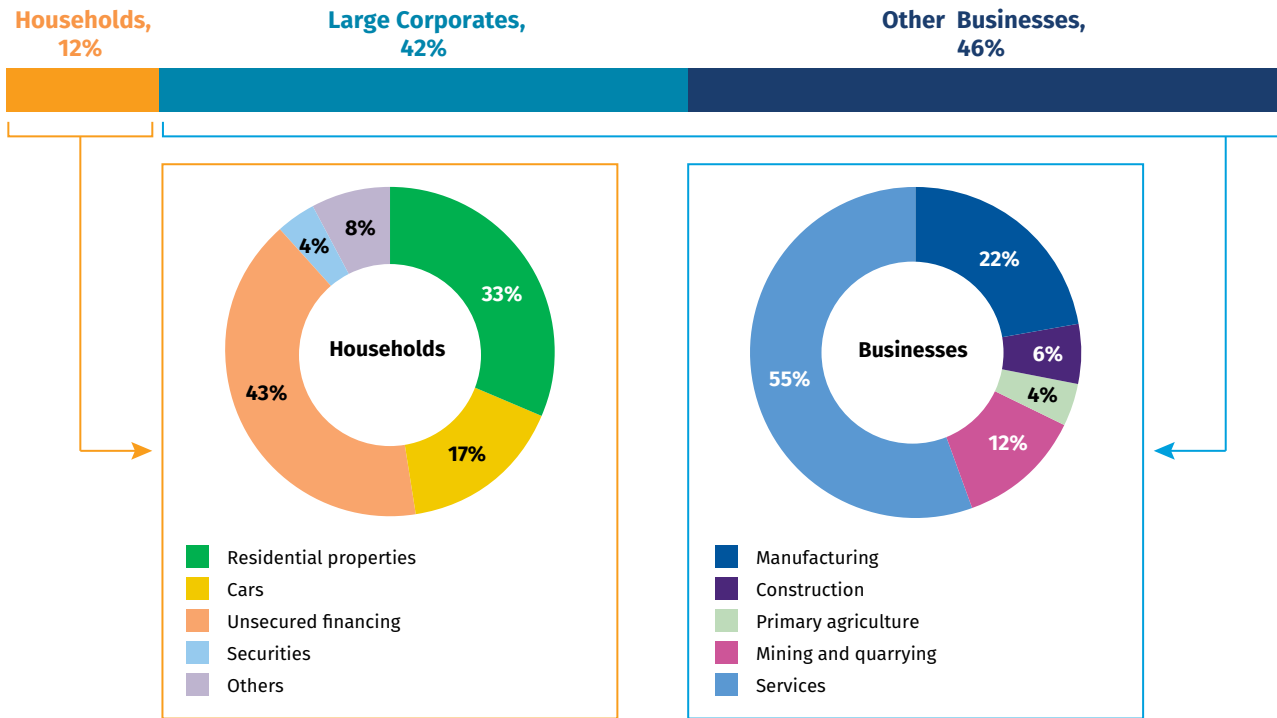
Diagram 2.3: Macro Simulation: Household Sector – Impairment Profile



Source: Bank Negara Malaysia

¹⁸ The R&R rates used are computed by banks and sectors, based on data submission from banks from April to June 2020. During this period, R&R activity was mainly for non-SMEs as SMEs were covered under the automatic loan moratorium.

Diagram 2.4: Macro Simulation: Banking System – Drivers of Projected Credit Losses in 2020 and 2021



Source: Bank Negara Malaysia

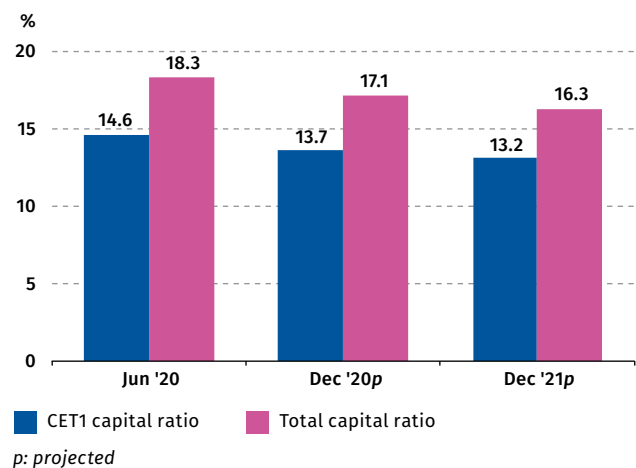
losses over a 12-month horizon based on their internal stress tests. Provisions could increase further as banks obtain greater visibility on credit developments based on more informed assessments of borrowers after the end of the blanket moratorium. The gradual build-up of provisions will also ensure that banks maintain healthy buffers to absorb losses and support continued lending to the economy.

The impact of stressed credit losses on banks' solvency would result in the aggregate total capital ratio (TCR) and CET1 capital ratio declining by 2 percentage points (ppts) and 1.4 ppts, respectively, over the next 12-18 months (Chart 2.25).

Under the bottom-up scenario analysis, the aggregate TCR and CET1 capital ratio as reported by commercial and Islamic banks are projected to decline by a larger extent of 3.4 ppts and 3.1 ppts, respectively, from initial positions. Applying a sensitivity analysis to these results, individual banks are projected to have adequate buffers above the regulatory minimum capital requirement to withstand further losses associated with default rates that are 8 times higher than the banks' historical default rates. These multiples are significantly more severe than Malaysia's historical

worst experience in the Asian Financial Crisis, during which overall impairments rose by 3-5 times from initial levels. The drivers of credit losses were observed to be broadly similar under both the macro simulation and the bottom-up analysis, further affirming that the financial system has adequate buffers to withstand extreme stresses that are more severe than the historical worst experienced to date.

Chart 2.25: Macro Simulation: Banking System – Capital Ratios



Source: Bank Negara Malaysia

Actual impact on banks' capital strength over the next 12-18 months will be subject to some degree of uncertainty

While the stress tests presented here capture plausibly adverse scenarios with some degree of conservatism, the actual impact of the pandemic on banks' solvency over the next 12-18 months will depend on multiple factors, including:

- **The pace and strength of the domestic economic recovery**, which in turn is contingent upon how the pandemic continues to evolve, labour market conditions and business and consumer behaviour in the new normal;
- **The pace of economic recovery within the region**, which could affect the asset quality and profitability of overseas operations of domestic banking groups;
- **Initiatives taken by financial institutions** to support viable borrowers, which could improve

debt servicing capacity and reduce potential impairments;

- **Bank management actions** to shore up buffers such as new capital issuances or capital injections from parent bank(s); and
- **Additional policy intervention** by the Bank, Government and/or other authorities to support economic recovery.

While banks can be expected to be more cautious given continued uncertainties and prospects of a more protracted recovery, it is in the collective interest of the banking industry to continue supporting viable businesses and households throughout this period. Capital buffers built up over the years are intended to support lending during times of stress and therefore can be used. Further, such buffers are vital for banks to remain resilient and reduce risk aversion. This will be critical to avert larger repercussions on economic growth and recovery prospects, which in turn will inflict much higher losses on banks.

Key Features of the Enhanced Macro Solvency Simulation for Banks

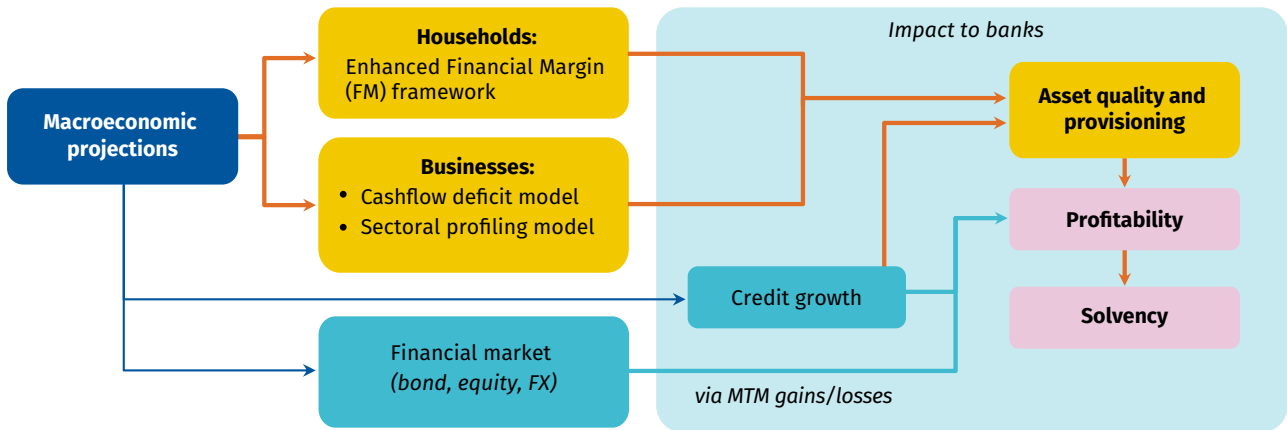
The scenario and assumptions used in the macro solvency simulation encompass a quarterly time horizon, with forward-looking projections up to end-2021. This aims to capture the effects of macroeconomic and financial shocks that could be transmitted much faster during a crisis, thus enabling the identification of emerging pockets of risk in interim periods.

Accordingly, the models and assumptions underpinning the macro simulation have been refined to improve the Bank's estimations and vulnerability assessments (Diagram 2.5 and Table 2.2):

- Enhanced versions of existing macro credit risk models for household and business borrowers were used to assess the impact of weaker macroeconomic conditions on credit risk arising from loan migrations and higher impairments.
- To estimate the impact on provisioning from the deterioration in asset quality, the simulation drew upon existing institution-specific loan loss coverage ratios¹⁹ for different loan purposes and stages of loan performance based on loan classification under MFRS 9. This aims to better represent banks' actual credit risk models (Diagram 2.6).
- Remaining parts of banks' income and expenses also takes into account the impact arising from financial market volatility, slower credit growth in 2020, modification losses and lower interest rates.

¹⁹ Coverage ratios are defined as the ratio of provisions to loans of that stage defined under MFRS 9. For example, Stage 3 coverage ratio is the ratio of Stage 3 provisions to Stage 3 loans.

Diagram 2.5: Schematic of Macro Simulation Framework



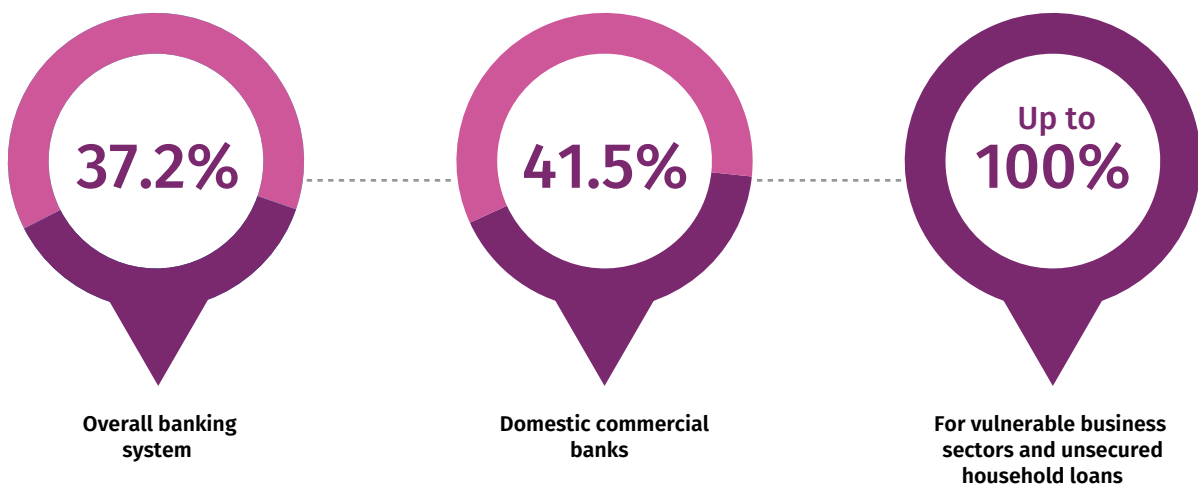
Source: Bank Negara Malaysia

Table 2.2: Key Assumptions

Section	Key Assumptions
Credit risk models	<ul style="list-style-type: none"> Loan migration across stages under MFRS 9 are estimated using macro models linking macroeconomic conditions to borrowers' debt servicing capacity New loans approved and disbursed during the simulation horizon are assumed to remain performing
Credit cost	<ul style="list-style-type: none"> Coverage ratios are derived for each individual bank, by (i) stages under MFRS 9, and (ii) loan sector/ purpose, and adjusted upwards to account for additional provisions made due to management overlays Banks are assumed to maintain coverage ratios throughout the simulation horizon
Net interest income	<ul style="list-style-type: none"> Estimations incorporate the impact from lower interest rates (OPR declined by 125 bps year-to-date), slower loan growth and modification losses
Non-interest income	<ul style="list-style-type: none"> Credit-related fee and commission income projected to grow in line with credit growth Cost-to-income ratios are assumed to remain stable throughout the simulation horizon, i.e. operating costs to move in tandem with income
Capital	<ul style="list-style-type: none"> Profits are recognised on a half-yearly basis. Dividend payment is assumed to be at 50% of half-year profits

Source: Bank Negara Malaysia

Diagram 2.6: Selected Stage 3 Coverage Ratios



Source: Bank Negara Malaysia

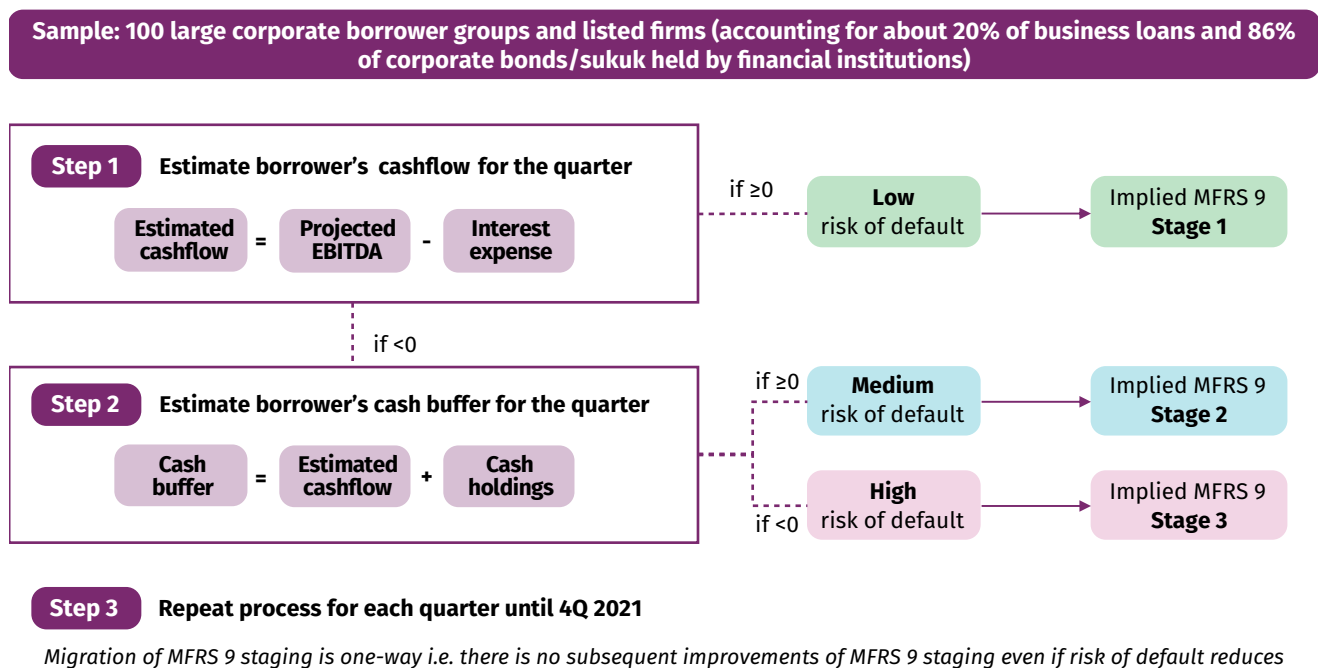
Forecasting Business Impairments: Two-pronged Approach

To simulate the potential trajectory of business sector impairments in the banking system for the macro simulation exercise, the Bank used two approaches, a cashflow deficit model for a sample of firms²⁰ with more accessible financial data and a sectoral profiling model for the remaining business exposures. This assessment also accounts for the risk profile of borrowers or borrower segments, repayment assistance extended by individual banks (based on experience during the early stages of the pandemic), and the effect of explicit government guarantees in mitigating losses.

(A) Cashflow Deficit Model

The cashflow deficit model determines a firm’s risk of default by estimating whether it has sufficient earnings or cash buffers to repay its interest obligations (Diagram 2.7). Quarterly earnings²¹ of a firm are projected up to end-2021 based on relationships established between sectoral GDP projections and firm-level financial data. These earnings are assumed to be used to service quarterly interest obligations during the period. In quarters where earnings are insufficient, the model assesses whether firms have sufficient cash buffers to draw on to honour interest obligations. Firms with sufficient earnings to service interest obligations are classified as “low risk of default” (MFRS 9 Stage 1), while firms that have to dip into their cash buffers are classified as “medium risk of default” (MFRS 9 Stage 2). This adds some degree of conservatism given that in practice, banks may continue to classify such exposures under Stage 1 if the borrowers have continued to service interest and coupon payments and there are no other evidence of a significant increase in credit risk. Finally, firms that have insufficient earnings and cash buffers are classified as high risk of default (MFRS 9 Stage 3). Stage 3 firms are assumed to default on all their exposures with financial institutions. Another layer of conservatism is applied to the model by assuming no reversion in the staging of firms, even if improvements in a firm’s earnings or cash buffers were observed in subsequent periods after it defaults.

Diagram 2.7: Cashflow Deficit Model



Source: Bank Negara Malaysia

²⁰ 100 large non-financial corporate borrower groups and listed firms. Large non-financial corporate borrower groups represent corporations with aggregate credit exposures (include direct financing and holdings of corporate bonds and sukuk) exceeding RM1 billion with Malaysian financial institutions.

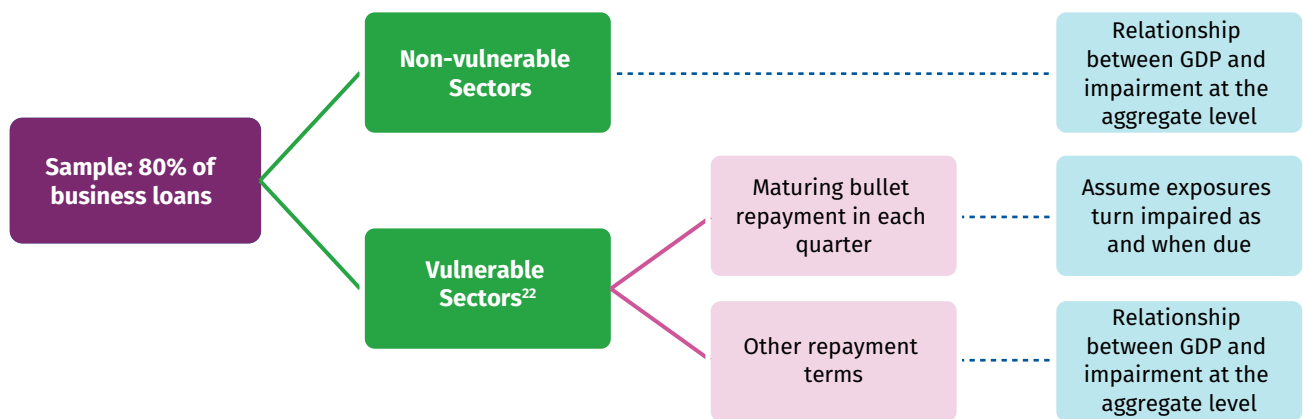
²¹ As measured by earnings before interest, tax, depreciation and amortisation (EBITDA).

(B) Sectoral Profiling Model

For businesses where firm-level financial data are not readily available, the sectoral profiling model is employed (Diagram 2.8). This model is premised on three key assumptions: (i) financing exposures of firms in the vulnerable sectors²² with bullet repayment terms will default²³ as and when they become due given the larger and immediate repayment obligations; (ii) impairments of other business exposures up to end-2021 are derived based on an established historical relationship between the annual growth of real GDP and business impairments at the aggregate level; and (iii) no SMEs are assumed to default before the end of the third quarter of 2020 due to the blanket loan moratorium in place between April and September 2020.

Reflecting a conservative approach taken in the estimations of business impairments, the model does not account for the effects of risk mitigants that could moderate the timing and magnitude of business impairments. These include (i) diversified revenue streams and available collateral for some of the larger borrowers; (ii) explicit credit guarantees by agencies such as Credit Guarantee Corporation Malaysia Berhad (CGC) and Syarikat Jaminan Pembiayaan Perniagaan Berhad (SJPP); and (iii) coordinated efforts by financial institutions, the Small Debt Resolution Scheme (SDRS) and the Corporate Debt Restructuring Committee (CDRC) to assist viable borrowers in restructuring and rescheduling loans.

Diagram 2.8: Sectoral Profiling Model



Source: Bank Negara Malaysia

²² Sectors that are deemed more vulnerable are those more exposed to the COVID-19 pandemic and those impacted by supply chain disruptions. These include the agriculture, mining & quarrying, manufacturing, construction, wholesale and retail trade, hotels and restaurants, transport and storage, and real estate sectors.

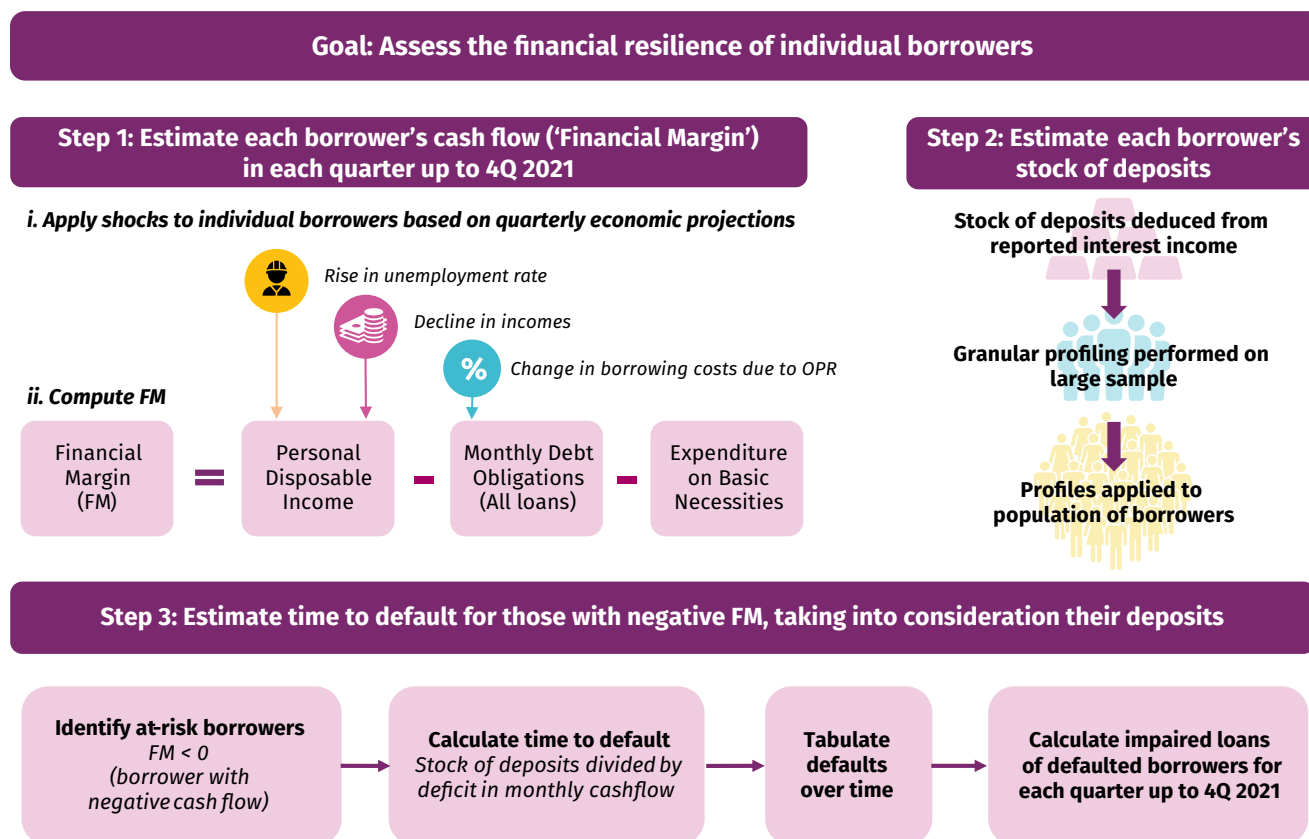
²³ Revolving credits are excluded as experience indicates that these exposures are typically rolled over.

Forecasting Households' Time to Default – Enhancements to the Financial Margin Framework

The financial margin framework is used in the Bank's in-depth assessments of households' financial health and resilience against hypothetical shocks, building off a rich set of individual borrower-level data. Previously, the framework ignores cumulative financial buffers that may be available to borrowers to meet shortfalls in monthly cashflows that are required to service debt and pay for essential expenditures. Borrowers are therefore presumed to default immediately when monthly cashflows are in deficit (i.e. negative financial margin), after accounting only for any positive cashflows from the previous month. This builds in a level of conservatism during normal times in order to capture tail-risks.

In the current environment, the Bank sought to further examine the ability of households to service their debt where more households may experience financial difficulties, but would be able to draw on financial buffers they have accumulated to sustain their debt repayments for a period of time. To this end, the financial margin framework was enhanced (Diagram 2.9) to account for the progressive draw down on deposits by households to meet shortfalls in monthly cashflows. Households are presumed to default only after their stock of deposits is depleted. The enhanced framework thus provides additional insights from a time dimension on the evolution of household default risk arising from income and unemployment shocks.

Diagram 2.9: Outline of the Enhanced Financial Margin Framework



Source: Bank Negara Malaysia

This framework only considers deposits as wealth. This is given the high uncertainty in estimating other forms of wealth²⁴ at an individual-level, and the easy accessibility to deposits in times of financial stress. A large sample of anonymised individual tax records and techniques²⁵ to measure wealth distribution was employed to estimate the stock of deposits held by individual borrowers.

Unlike the previous sensitivity analyses where one-off shocks were simulated, the enhanced framework simulates quarterly shocks. It also incorporates the effects of the automatic loan moratorium between April and September 2020 and the targeted assistance measures announced in July 2020.²⁶ During the automatic loan moratorium period, borrowers' debt obligations are set to zero. Subsequently, borrowers affected by simulated unemployment shocks are assumed to continue with zero debt obligations until end-2020, whereas all other borrowers' debt obligations are scaled by the quantum of income shocks simulated until the end of the targeted assistance period. With the gradual recovery in labour market conditions, the targeted assistance measures will continue to provide a measure of debt relief to borrowers who remain affected by the crisis. These measures are assumed to lapse after 1Q 2021. The enhanced financial margin framework does not include the impact of additional initiatives beyond the targeted assistance measures announced, such as banks' bespoke R&R efforts or programmes by the Credit Counselling and Debt Management Agency (Agensi Kaunseling dan Pengurusan Kredit, AKPK). Such additional support extended would further contain a rise in distress among households.

²⁴ Other forms of liquid financial assets include investment in equities and unit trust funds (fixed and non-fixed price). Valuations for some of these assets tend to be volatile, further complicating their measurement, and hence the deliberate omission from the computation.

²⁵ Saez and Zucman (2014), 'Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data'.

²⁶ These measures include (i) an extended loan moratorium for unemployed borrowers in 4Q 2020 and (ii) a reduction in debt obligations proportionate to income declines over the period 4Q 2020 – 1Q 2021.