## 4. Resilience of the Banking Sector under Adverse Conditions

*The stress scenario is not a forecast of macroeconomic and financial conditions. It is a hypothetical, coherent tail-risk setting designed specifically to assess the resilience of the banking sector to a potential deterioration in macroeconomic conditions. This year's stress testing exercise assesses the extent to which the banking sector is able to withstand the potential impact of COVID-19 under the baseline and a hypothetical stress scenario. Under the baseline scenario, the sector's current level of solvency moderately deteriorates, but remains well above domestic regulatory benchmarks. Under a more severe scenario as well, the banking sector should be able to withstand a protracted downturn induced by adverse macroeconomic conditions associated with a more virulent and longer lasting pandemic. In terms of size, the small, medium and large banks as segments are all able to withstand the stress conditions. Reassuringly, the large size banks with potential to cause systemic disruptions carry sufficiently higher capital buffers and are expected to sustain the impact of the shock over a five year horizon. Similarly, the medium sized banks never breach the solvency criteria during the projection horizon. However, the resilience of small size banks starts waning by the end of the five-year simulation period, though their CAR remains above the regulatory benchmark otherwise. Although projected credit decelerates under both baseline and stress scenarios, the banking system, with adequate capital buffers amid the on-going regulatory measures to contain the economic fallout from COVID-19, is expected to continue catering to the credit needs of the economy. That said, the exact severity, duration and path of the COVID-19 pandemic globally and domestically remain unknown. As a result, the stress-test results are also subject to significant uncertainty. Nonetheless, the SBP continues to watch events closely and remains ready to take whatever actions necessary to safeguard financial stability.*

### 4.1 Background and Developments

The feedback effects between the real and financial sectors, where vulnerabilities in one sector spillover to the other, have been most prominently highlighted by the onset of the global financial crisis (**GFC**) of 2007-08. Since then, regulators and supervisors have enhanced the level of oversight of the financial sector, buttressing the resilience of the sector to withstand shocks transmitting from the rest of the economy. At the same time, stress-testing frameworks are also being extensively used by domestic regulatory and supervisory authorities as well as multilateral agencies to assess the resilience of the banking sector to certain hypothetical adverse yet plausible event(s). The results of these stress tests depict the projected behavior of macro-financial variables and health of the banking sector under the assumed scenarios.

The SBP has been conducting this exercise internally on a quarterly basis since 2005. For external stakeholders, stress-testing results are published annually in the FSRs since 2007-08. The stress-testing framework at SBP is being continuously revamped and strengthened.

The current year's stress testing exercise mainly focuses upon an impact assessment of the Global Health Crisis (**GHC**) for the domestic banking sector over medium term i.e. five years from Q1CY20 to Q4C24. The stress testing exercise is based on two scenarios, which differ in terms of assumptions regarding the spread and duration of COVID-19 at home and across the globe.

The baseline scenario traces the path of macro-financial variables under the current dynamics of the domestic macroeconomy, while assuming that the spread of COVID-19 will be relatively contained and short-lived; mainly limited to the first half of CY20. On the other hand, the stress scenario assumes a protracted and wider spread of COVID-19 in CY20 and well into CY21.[236]

[236] Usually three types of shocks are considered in stress testing based on the length of the shock events i.e. V-shaped, L-shaped and U-shaped. The shapes are envisaged in terms of recovery. V-shaped assumes quick recovery; L-shape assumes protracted downturn while U-shaped assumes recovery towards the end of

The methodology used to evaluate the resilience of the banking sector in the two scenarios is similar. Given the interaction between various sectors of the economy, a number of variants of vector autoregressive (**VAR**) and Bayesian VAR models have been employed.[237] [238]

In addition to the overall assessment, cross-sectional heterogeneity has also been captured for the different segments of the banking industry in terms of size, i.e., small, medium, large banks.

### 4.2 Scenario Design Overview

Since the outbreak of COVID-19, the global economy has been hit by exceptional levels of uncertainty and unprecedented demand and supply shocks. Lockdowns and social distancing measures necessary to contain the spread of the contagion have caused extreme economic disruption both at home and across the world. It is important to note that the domestic economy was just beginning to recover from a crisis induced by twin deficits, which necessitated IMF support in the form of an Extended Fund Facility secured in July 2019.[239]

Considering the severity of the slowdown that could be caused by the necessary prevention and mitigation measures for COVID-19, the focus of policy makers has changed, temporarily, from stabilization to insulation of the domestic economy from the pandemic induced crisis. Several adjustments have been made in the areas of monetary, fiscal and macro-prudential policies to bolster the capacity of the healthcare system, combat the contagion, flatten the recession curve, strengthen social safety nets and safeguard financial stability. Fresh multilateral support, in the form of the IMF's Rapid Financing Instrument (**RFI**) has also been secured in a timely manner.

Against the backdrop of economic challenges posed by COVID-19, the baseline and stress scenarios analyze macro-financial stability in the medium run, incorporating, as far as possible, the policy responses to the situation.

The implication of changes in macroeconomic indicators such as output, inflation, exchange rate, interest rate and exports, on the health of the banking sector have been captured via non-performing loans, profitability and solvency. Specifically, the economic downturn can negatively influence the income levels of borrowers, affecting their debt servicing capacity and amplifying the credit risk for banks. This in turn would put adverse pressures on the profitability of banks, thus negatively affecting their solvency.

Given the feedbacks, the solvency issues in the banking sector could spill over to the real economy as the banks would be reluctant to provide credit for even potentially profitable investment opportunities, thus amplifying the downturn. The expected sharp deceleration in credit flows by the banks during the downturn could further slow the pace of economic growth.

Stress test models, which are designed to test the banking industry's resilience against adverse shocks, capture these inter-linkages among the various sectors of the macro economy. In terms of risk coverage, the resilience of the banking sector has been assessed against credit, market (interest rate and exchange rate) and operational risks.

#### Baseline Scenario

The baseline scenario, Scenario 0, is built on the basis of observed dynamics of the domestic and global outbreak of COVID-19 and the associated policy response to the crisis. The global economy

projection horizon. Under this terminology, baseline and stressed scenarios are assumed to be V-shaped. However, owing to high level of severity in the stressed scenario, recovery takes a longer time compared with the baseline scenario.

[237] For details, please see 'Box 4.1 Technical Details' of Chapter 4: Resilience of the Banking Sector, Financial Stability Review 2016, SBP. In all we use 12 variants of VAR models, and an equal number of Bayesian VAR models. The models contain variants of macro-financial variables.

[238] One fifth of the authorities use VARs for macro stress testing. Bank for International Settlements (BIS) 2017. *Supervisory and Bank Stress Testing: A Range of Practices,* (December).

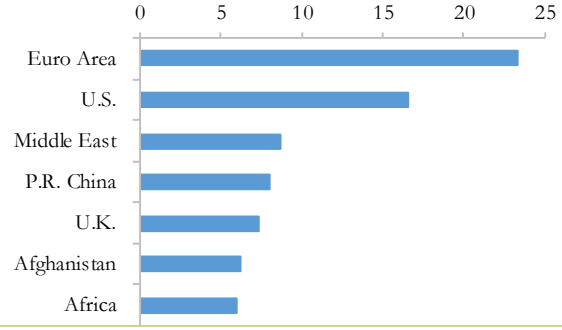
[239] For detailed discussion of key issues relevant to global and domestic economic environment, please see Chapter 2.

was facing rising uncertainty and declining sentiment amid global supply chain disruptions owing to lockdown in China since January 2020. Since the detection of initial cases at the end of February 2020 in Pakistan, different strategies are being adopted to mitigate the spread of disease. These include closures of educational institutions, halt on public transportation services, ban on mass gatherings and imposition of economic lockdowns except for essential sectors such as food, medical services and financial services. Lockdowns, across different provinces, started in the second half of March and continue to be in effect at the time of finalization of this report (end of April 2020). These lockdowns and unprecedented level of uncertainty have led to mutually re-enforcing aggregate supply and demand shocks to economy. On supply side, the services sector in general (61.21% of GDP) and subsectors of wholesale & retail trade (18.9% of GDP) and, transport, storage & communication (12.9% of GDP) in particular are hit by the shock. The services sector is likely to be hard-hit by the crisis as its value addition is highly time-specific and cannot be reclaimed once disrupted due to lockdowns. Large scale manufacturing (10.19% of GDP) is also expected to be badly hit by the lockdowns. Value addition of agriculture (18.53% of GDP) may also decline due to low demand amid bans on mass gatherings and closure of restaurants. Apart from these supply disruptions, domestic private consumption and investment demand conditions are also very weak owing to heightened level of uncertainty.[240]

In addition, external demand is also expected to be on the lower side. Prior to the start of the GHC, Pakistani exports had started to signal revival in volume terms.[241] However, in the post-GHC environment, Pakistan's major export destinations are severely affected by COVID-19 and therefore, export demand is likely to be weak **(Chart 4.1 and 4.2)**.

Chart 4.1: Key Export Destinations of Pakistan

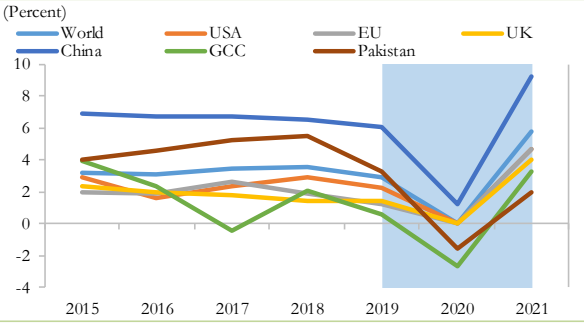
(5-Years Average of Percent Share in Total Pakistan Exports)




Source: IMF Direction of Trade Annual Statistics

Accordingly, in sync with international observers,[242] Scenario 0 assumes that the GDP growth rate will decline to -1.5 percent for FY20 before gradually recovering to 2 percent in FY21 and ultimately reaching 5 percent in the medium term by 2024.

Chart 4.2: GDP Growth Rates in Key Economies



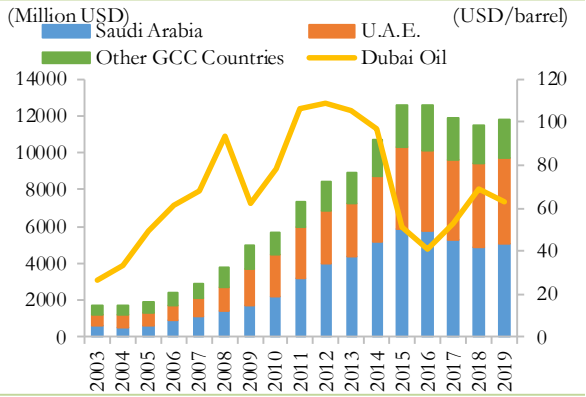

Source: IMF

Along with the exports, workers' remittances constitute a key source of foreign exchange inflows for Pakistan. However, owing to weak demand in the EU, USA, and China, oil prices are at historically low levels. This situation implies that remittances from the western hemisphere as well as from Middle East may observe substantial moderation **(Chart 4.3)**. However, on a positive note, low oil prices and weak domestic demand are likely to cause a substantial reduction in the import

[240] All GDP shares are based on FY19 data.
[241] SBP (2020), Monetary Policy Statement, January
[242] IMF (2020) forecasts Pakistan GDP growth for FY20 to -1.5 percent. World Economic Outlook, April. World Bank (2020) also forecasts Pakistan GDP growth in the range of -1.3 to -2.2 percent with significant downside risks. World Bank South Asia Economic Focus, April.

bill.[243] Further, IMF funding under its Rapid Financing Instrument and other facilities/relief expected through multilateral and bilateral support will help meet immediate balance of payment (**BoP**) needs arising in the context of imports to control pandemic amid tapering inflows due to weak exports and remittances. Based on these developments, the current account deficit is expected to broadly maintain the trajectory that it recently achieved under IMF stabilization program. As a result, volatility in exchange rate should remain contained.

Chart 4.3: Remittances from Middle East and Oil Prices



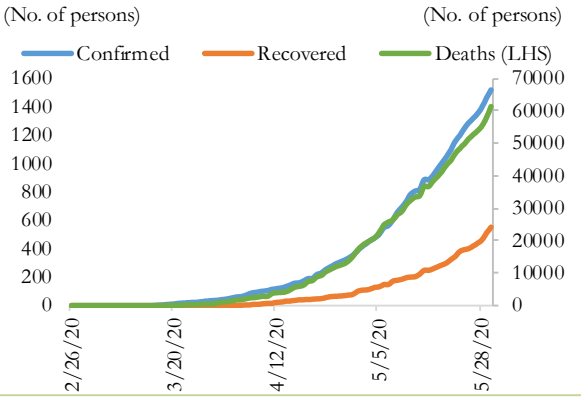

Source: SBP and World Bank Commodity Prices

On the back of weak demand, lower oil prices and a stable exchange rate, the baseline scenario assumes that inflation will come down to 11-12 percent during FY20, 7-9 percent during FY21 and 5-7 percent over medium term by 2024. In accordance with weak demand and decelerating inflation, the interest rate is also assumed to follow a declining trajectory.

## Stress Scenario

The hypothetical stress scenario, Scenario 1, has been built around a more severe scenario regarding the spread and duration of COVID-19 in Pakistan and across the globe. So far, despite a persistent rise in the number of confirmed patients, the number of deaths and critical patients have been quite limited in Pakistan **(Chart 4.4).**

Chart 4.4: Domestic Spread of COVID-19




Source: Data Hub

However, in the absence of any concrete developments regarding the discovery of a vaccine/cure for the pandemic so far, the risk of a widespread and prolonged contagion—both at home and across the world—remains elevated. The risk of a sharp domestic outbreak is also exacerbated owing to population density, inter-provincial migrant workers, urban slums and the limited capacity of the health infrastructure to handle a mass-level outbreak. Apart from a more prolonged duration of the current contagion, risk of its reemergence in coming years after initial success of containment efforts also cannot be ruled out. Consequently, the economic environment is expected to be clouded by an unprecedented level of uncertainty.

Against this backdrop, Scenario 1, assumes a protracted and widespread outbreak of COVID-19 at home and in rest of the world. The scenario also assumes a reemergence of the disease in CY21.[244] If this scenario materializes, it is likely to substantially curb domestic economic activity and employment by necessitating stringent social distancing measures e.g. prolonged lockdowns to contain the spread of the contagion. The stress scenario assumes that GDP registers a negative

[243] Payments for imports of petroleum products accounted for 26.40 percent of total imports bill in FY19.

[244] In terms of the global spread and duration of COVID-19, Scenario 1 follows the assumptions under the most severe downside scenario from the latest IMF World Economic Outlook. IMF (2020), World Economic Outlook, April.

growth of 1.5 percent in FY20 with a further slide to negative 5.0 percent during FY21.[245] GDP growth is assumed to gradually recover to 3 percent by FY24.

The scenario assumes that reductions in aggregate supply will dominate slack in aggregate demand; thereby leading to an upward pressure on prices. In the recent past, food inflation has been presenting a challenge for domestic policy makers **(see Chapter 1)**. Against a backdrop of more severe domestic supply chain disruptions, greater bottlenecks in regional trade and elevated demand due to potential panic buying amid continued lockdowns, food inflation could push up headline inflation. To be precise, the scenario assumes that average inflation may rise to 15 percent[246] during FY21 before gradually returning to 9 percent by FY24. This situation may necessitate an appropriate monetary policy response to check inflationary expectations.

Since the scenario assumes that supply losses will dominate the slack in demand, import demand, especially for essential items, may also rise. Considering the weak demand for exports and low remittances, this high demand for imports could translate into pressures on the current account balance and exchange rate.

### 4.3 Stress Testing Results: System Level

#### *(a) Impact on Credit Riskiness*

The results of the stress test exercise indicate that the gross non-performing loans ratio (**GNPLR**), under Scenario 0, is likely to remain somewhat elevated over the five-year projection horizon, given weak domestic demand, supply disruptions and external sector pressures **(Chart 4.7)**. The denominator effects due to contracted lending portfolio may also be responsible for the relatively elevated delinquency rate. Over the first half of the projection horizon, the GNPLR peaks at 11.80 percent before settling at the level of 10.35 percent by the end of projection period, which is 1.77 percentage points higher than current level of 8.58 percent (as of end CY19). This is mainly in line with our assessment of the domestic economy, where certain existing macroeconomic vulnerabilities may cause a moderate rise in non-performing loans of the banking sector.

The GNPLR, under hypothetical Scenario 1, on the other hand, rises faster than the baseline because of the assumed greater and more prolonged deterioration in macroeconomic conditions. The banking industry shows less resilience towards the assumed shocks (Scenario 1) as the delinquency rate peaks at 14.65 percent before settling at 13.62 percent by the end of projection horizon. The latter level is 5.04 and 3.26 percentage points higher than the current level and the level under the baseline scenario, respectively.

Credit risk under the stress scenario matches the vulnerabilities observed during the 2008 crisis period. The growth of the lending portfolio, which decelerates for one year under the baseline, slackens for two years in Scenario 1. The stress scenario, therefore, could pose moderate stability concerns to the banking system of Pakistan.

#### *(a) Impact on Solvency*

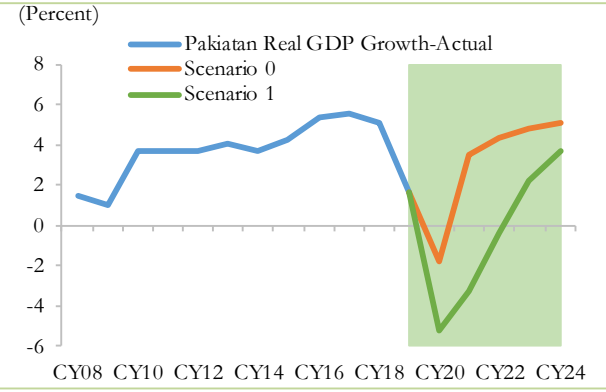
The impact on solvency is measured via the Capital Adequacy Ratio (**CAR**) of the banking system. As explained in the scenario design, besides credit risk, two other risks are likely to have an impact on solvency: market risk, realized via movements in interest and exchange rates, as well as operational risk. These three risks, therefore, have also been factored in while analyzing the impact of each scenario on capital as well as risk-weighted assets. Under the baseline environment, the CAR of the banking system moderately deteriorates by 1.12 percentage points by the end of the projection period. In Scenario 1,

[245] At peak level during FY21, the stress scenario assumes 7 percent less GDP growth relative to baseline.

[246] At peak level during FY21, the stress scenario assumes 7 percent higher inflation relative to baseline.

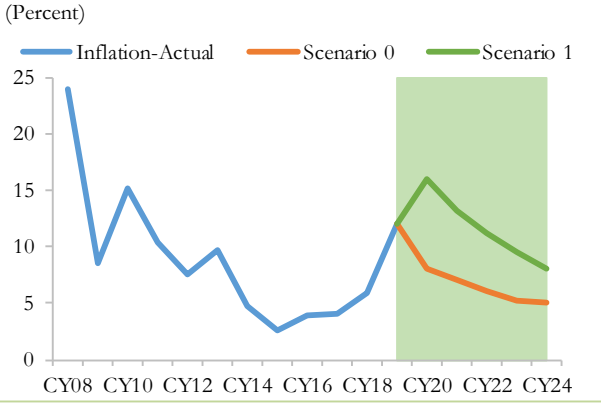
however, it settles at 14.48 percent, which is 2.53 and 1.41 percentage points lower than the current level and baseline scenario, respectively.

Chart 4.5: Projected Real GDP Growth under various Scenarios



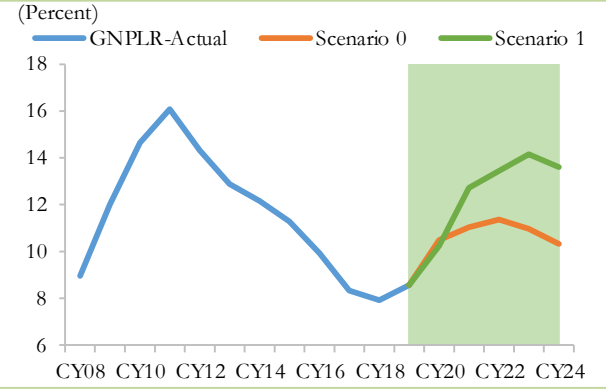

Source: SBP Calculations

Chart 4.6: Projected Inflation under various Scenarios



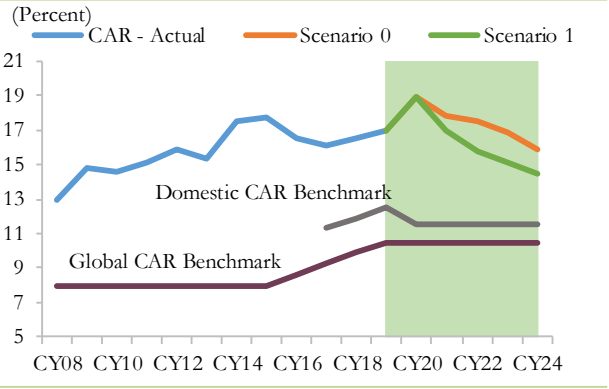

Source: SBP Calculations

Chart 4.7: Projected System-Level GNPLR under various Scenarios




Source: SBP Calculations

Chart 4.8: Projected System-Level Capital Adequacy Ratio under various Scenarios




Source: SBP Calculations

However, under either scenario, the banking industry does not breach any of the regulatory benchmarks, be it domestic (11.5 percent) or international (10.5 percent), over the projection horizon **(Chart 4.8)**.[247]

The resilience of the banking sector, despite unprecedented level of assumed turmoil in real economy, can be justified based on three facts. First, the COVID-19 shock has hit the economy at a time when domestic banks have an ample amount of capital buffers. Specifically, at 17 percent, the CAR is substantially higher than global and domestic benchmarks. Second, the banking sector's risk averse behavior during contractions, whereby banks undertakes aggressive portfolio re-balancing by shifting from riskier private sector loans to risk-free treasury investments, keeps the sector from falling below the regulatory CAR standards. Going forward, the budget deficit is expected to widen due to relief measures for the ongoing COVID-19 pandemic.

[247] The domestic CAR benchmarks are 12.5 percent for December 2019, however, reduced to 11.5 percent owing to mitigation measures for COVID-19. (BPRD Circular Letter No. 12 of 2020)

At same time, economic slack is expected to result in tax collections below par. The demand for budgetary borrowing is accordingly expected to be higher. Finally, if history is any guide, the banking sector has shown resilience during the balance of payment crisis that coincided with global financial crisis in 2008; and more recently, withstood the twin deficit crisis that started in 2018 and led to a substantial fall in GDP growth and a rise in inflation.

## 7.4 Stress Testing Results – Segment Level Analysis

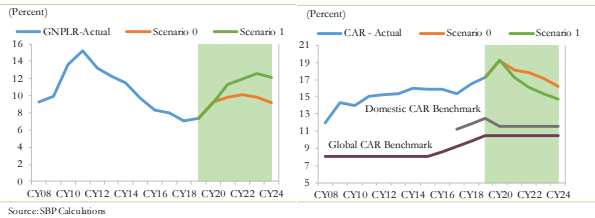
In line with the system-level default analysis, segment level (small, medium, large) infection ratio has also been projected. This aspect of the banking industry is included to assess how cross-sectional heterogeneity affects the resilience of banks against various macroeconomic risks.

For GNPLR, system-level projections of non-performing loans and gross advances are distributed proportionately based on the contribution of each segment to the loan portfolio of the entire banking system as of December 2019. Similarly, capital is also distributed proportionately to compute segment level CARs.

### *Large Banks*

Under the baseline and hypothetical scenarios, the large banks segment—comprising 70.89 percent of the banking system—witnesses a rise of, respectively, 1.82 and 4.73 percentage points in GNPLR and a fall of 1.09 and 2.52 percentage points in CAR, by the end of the projection horizon **(Chart 4.9 (a & b))**. The CAR remains 4.68 and 3.24 percentage points above the minimum requirement under the two scenarios.

Chart 4.9: Projected GNPLR and CAR of Large Banks



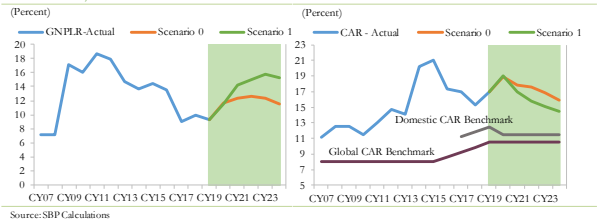

Source: SBP Calculations

None of the regulatory CAR standard is breached for this category of banks, which implies that the large banks are generally well-placed to withstand stress over the simulation horizon **(Chart 4.9 (b))**. Sufficiently higher capital buffers available with larger banks are a likely factor behind this resilience. More importantly, the systemically important banks remain well-capitalized and resilient to prevent contagion and support real economic growth even in times of stress.

### *Medium-sized Banks*

By the end of the projection period, the GNPLR of medium-sized banks rises by 2.29 in in Scenario 0 and 5.94 percentage points in Scenario 1. The CAR, correspondingly, falls by 1.07 and 2.48 percentage points under the two scenarios. The medium-sized banks remain compliant to the regulatory CAR standards, even under the stress scenario **(Chart 4.10 (a & b))**.

Chart 4.10: Projected GNPLR and CAR of Medium Banks




Source: SBP Calculations

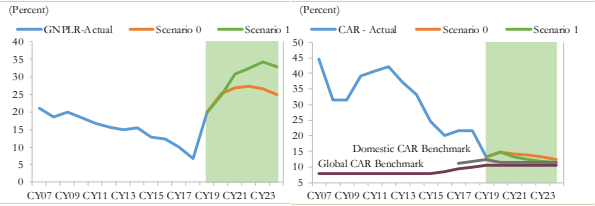
Their level of CAR remains 4.44 and 3.02 percentage points above the minimum requirement in scenario 0 and 1, respectively. That said, their relatively higher levels of delinquency ratios and lower level of pre-shock capital buffers, possibly make medium banks relatively more vulnerable to shocks than large ones.

### *Small Banks*

Small banks—comprising 4.31 percent of the banking system—are found to be the least resilient against both scenarios. The loan delinquency rate of small banks rises by 4.95 and 12.85 percentage points under scenario 0 and 1, by the end of five-year horizon **(Chart 4.11 (b))**, which is the highest

among all three categories.

Chart 4.11: Projected GNPLR and CAR of Small Banks




Source: SBP Calculations

Given their lower exposure, comparatively, in terms of loans, the CAR of small banks falls by 0.84 percentage points in scenario 0 and 1.95 percentage points in scenario 1 **(Chart 4.11 (a))**.

The small sized banks, while maintaining resilience under the baseline, breach the domestic regulatory CAR standard towards the end of projection horizon under severe stress only. This is mainly due to their having the lowest level of pre-shock CAR among all categories, with a capital buffer of just 0.84 percentage points. Small banks thus demonstrate the least resilience to maintaining compliance with minimum capital requirements with respect to credit losses. Reassuringly, the minimum global benchmark, however, would not be violated in any scenario over the projection period.

Overall, under the baseline scenario, the solvency of the banking sector could experience some moderation; however, it remains above the domestic regulatory capital benchmark. Under the hypothetical stress scenario as well, the banking sector should be able to withstand some severe and protracted downturn induced by adverse global and domestic macroeconomic conditions, including the COVID-19 pandemic. In terms of size, all segments of banks including the small, medium and large, can withstand the stress conditions as well. Reassuringly, the large size banks, with the potential to cause systemic disruptions, carry sufficiently higher capital buffers and are thus able to sustain the impact of hypothesized shocks for five years horizon. Also, the medium-sized banks never breach the solvency criteria during the projection horizon of five years.

The resilience of small-sized banks, however, starts waning towards the end of simulation period.

That said, the exact severity, duration and path of the COVID-19 pandemic globally and domestically remain unknown. As a result, the stress-test results are also subject to significant uncertainty. Consequently, the SBP continues to watch events closely and remains ready to take whatever actions necessary to safeguard financial stability.