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IMPACT OF COVID-19 ON LIQUIDITY OF THE BANKING SECTOR OF PAKISTAN

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ABSTRACT

The 33 banks of Pakistan's banking sector were tested using different stressed testing techniques already used in researches are renowned in world of finance to stress test any financial institutions. The results of Stress testing suggest that only Faysal Bank and Standard Chartered Bank are secured banks in terms of stable liquidity outlook. All other banks except foreign banks

are vulnerable to small liquidity shocks. Moreover, most of the banks have very low Liquidity Coverage ratio showing the clear asset liability mismatch in short run. The test is run on the Balance sheet data of December 31, 2020.

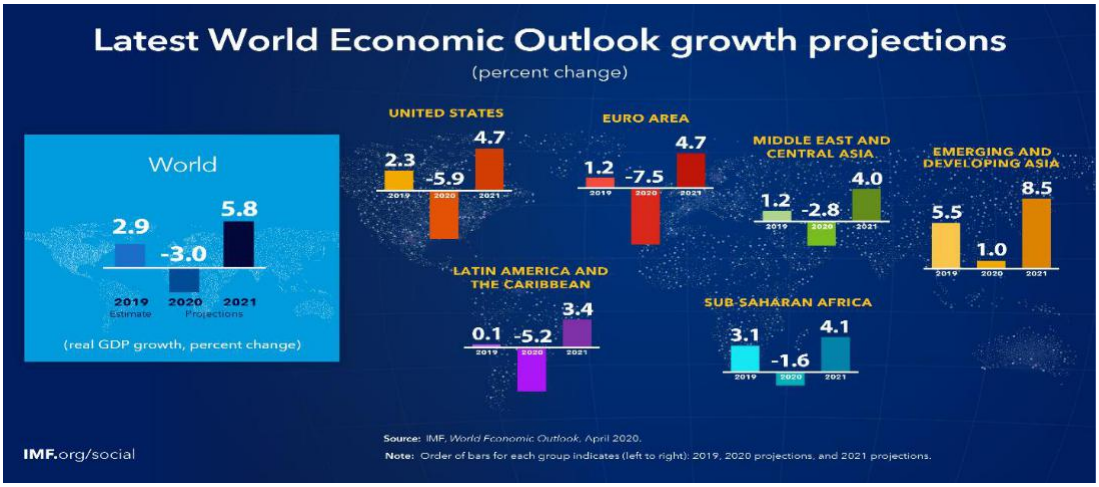
INTRODUCTION

As of May 6, 2020 there are 3.3 million people effected with virus, 1.2 million recovered cases and 260,000 confirmed deaths (WHO, Coronavirus disease 2019: World Health Organization, 2020)As of May 6 2020, there are 22,550 confirmed cases, while 6217 people got recovered and 564 people lost their lives. There is complete lock-down in the different countries and financial hubs of Europe, Asia, America and Australia. Thus, global economies have come to standstill and the impression of COVID-19 on global outlook is much more engraved than compared to other pandemics and economics crisis, which world has experienced in last two centuries.

Organization for Economic Co-operation and Development (OECD) has cut its global GDP growth projection by half percentage points for CY20, keeping in view the global economic conditions. Similarly, according to the assessment of Asian Development Bank (ADB), the decline in global GDP may range from 0.1 to 0.4 percentage points depending upon the intensity of COVID-19 pandemic.

The decline of 0.4 percent in global GDP would lead to almost USD 3.5 trillion. (Duffin, 2020) IMF World Economic Outlook (WEO) released on April 14, 2020 suggested that global economy would experience its worst recession since the Great Depression,1930. IMF has called it" the **Great Lockdown**". The IMF assumes global toshrink sharply by 3.0 percent in CY20, this number far more than what world experienced during the 2008–09 financial crisis. The baseline scenario, which considers that the pandemic fades in the third quarter of CY20 and policiesproduce the desired results, the global economy is then projected to grow by 5.8 percent in CY21, as worldwide economic activities will be back to normal. However, this projection is subject to downside risksthat would lead to severe outcomes. In addition to it, the report also highlighted growth projections of the Emerging Market Economies (EMEs) and Pakistan is assumed to be among the lowest growing economies in next (financial) year. The IMF's forecast for Pakistan's economy suggest that it would shrink by 1.5pc during the current quarter and would grow by only 2.0 percent in FY21. (IMF, 2020)

On overall basis, the advanced economies are assumed to face negative growth of 6.1 percent in CY 2020 while growth of Emerging Market Economies (EMEs) would decline by 1.0 percent. Table 1 gives the brief outlook of the global economies:



These pandemic are not new to world rather there is long history. The last century world faced three major pandemics;

i. 'Spanish Influenza',1918,
ii. 'Asian flu', 1957 and
iii. 'Hong Kong flu', 1968.

This frequency has substantially increased in 21st century as before COVID-19 there were four pandemic outbreaks:

i. N1H1 during 2009 (commonly knowns as 'bird flu'),
ii. Severe Acute Respiratory Syndrome (SARS) during 2002,
iii. Middle East Respiratory Syndrome (MERS) during 2012, and
iv. Ebola which peaked in 2013-14.

Spanish Flu**:** Spanish Flu, or Great Influenza, this pandemic compassed the global world from 1918 to 1920; it claimed around 43 million people, 2 percent of the world population. There were three pandemic waves, which claimed the life of several famous personalities of the world including the grandfather of current President of the USA.

But the important question is what was the economic cost of Spanish Flu? By analyzing the affects of Pandemic between 1918-1920 across 43 countries, Barro et al. estimated impact on real GDP.The results of his research suggested that the Pandemic reduced average per capita real GDP by 6.0% in the affected country.

Asian flu (H2N2): Starting in 1957 from the Chinese province of Yunan, it resulted in 1.1 million deaths across the globe. (Mauro, 2020)
Hong Kong flu (H3N2): Starting from Hong Kong in July,1968, the virus peaked in December 1968 and claimed life of almost 1.0 million people worldwide. The most of the people, who died due to this Pandemic were above the age of 65.

Severe Acute Respiratory Syndrome (SARS): Like most of the Pandemics, this virus also had its roots in China. Although virus was originated at the end of 2002 but WHO wasupdated regarding this outbreak in February 2003. The virus

resulted in 5,327 deaths in China and 1,755 deaths in Hong Kong. The morality rate in China was 7% while in other countries it was in range of 11% to 17%.

2009 Avian flu (N1H1)**:** The maiden case of this Pandemic was detected in California in the springs of 2009. Before the Pandemic ends it costed life of 575,400 people worldwide whereas 151,700 people lost their life in Asia.

Middle East Respiratory Syndrome (MERS): This was a respiratory disease caused by a Coronavirus, that's why it was also called as MERS- CoV (WHO, Fact sheets: MERS-CoV, 2019). The virus had a high level of morality rate i.e. 35 percent.

Ebola Virus Disease (EVD): This was another virus with very level of morality rate, it surfaced in 2013. It roots were in Africa with an average fatality rate of around 50%. The total number of deaths due to this virus were 11,353.

Nature of economic shocks

The economic impact of all these pandemics suggest that we can divide sources of economic shocks as:

- Firstly, the pandemics lead to medical constraints, as in severe cases workforce suffers and thus, lead to fall in GDP production.
- Secondly, the world economies sometimes get severely impacted and consequences of precautionary measures like closures of factories, shopping malls, educational institutions and quarantine have combine impact on economic growth.

Now, let's discuss the supply side and demand side shocks pertaining to COVID-19.

Demand-side shocks

The virus has really impacted our nerves. We are now sitting in our homes not going to our offices, our children are not going to their schools and universities. There are no activities in the evening. One cannot go to Parks, Shopping Malls, Cafes, Clubs or even for that very purpose, the visits to friends, relatives and neighborhood are also avoided to practice the newly crafted term 'social distancing' in letter and spirit. All these measures have substantially reduced the demand of goods and services. Only necessary goods are in demand, thus, we have long queues in gross stores, while rest of the retail/wholesale shops are all close. Thus, the demand side shocks have reduced the general demand to only necessary goods, the goods required to fulfill our basic survival needs. Initially, during the month of March, 2020 in Pakistan, 'panic buying' was witnessed across the country resulting in the acute shortage of hand sanitizers, face masks

and disposable gloves. But again this demand was concentrated to particular type of goods and this is story of whole world not only confined to our country.

Supply-side shocks

As highlighted earlier, the first constraint for the producers is labour. The production area of the factories isusually the dense area and keeping in view the layout and design of factories, it is not possible to implement the ideology of 'social distancing'. Thus, when labour will not join factories, the output of the factories would reduce. Similarly, these factories mostly have labour on daily wages, with lock-down in practice, the labour is either getting reduced wages or in extreme cases they are not getting any wage. This 'decreased or no wage' phenomena is not limited to factories rather it applied to all other businesses in general. This would mean a reduction in the monthly income of the people in general which in turn would mean low demand for goods and this low demand would result in low level of revenues for the factories. The low revenues might turn the profits of some businesses to losses. What would this loss mean? The stable and large entities would be able to survive through this tough period either by availing subsidized financing facility of central bank or utilizing their retained earnings. But small businesses would suffer as they would not be able to avail the subsidized facilities (due to their grim financial outlook) and would not have strong financial base to use its own resources. Such businesses might become bankrupt, which would not affect economy with increased level of unemployment, decline in output and in extreme situation would destabilize the banking system. Certainly, this an early wake-up call for the banks and the regulator of banks to take corrective measures in back drop of expected defaults.

Impact on banks

The center point of supply shocks and demand shocks are the financial intermediaries. The banks are nothing but an entity which moderates the flow of fund from one section of the economy to the other. Broadly speaking banks have two variables to balance:

1. Deposits
2. Advances

IMPACT ON DEPOSITS:

The banks usually have three types of deposits

Long-term interest bearing deposits

These deposit are usually fixed income deposits and carries high rate of return. Banks offer high return on long-term deposits because these funds become part of their portfolio for longer period of time, gives them time match it parallel long-term investment to avoid liquidity issues in the long-run. For banks they are often

high cost deposits but they give stability to their liquidity outlook. The withdrawal from these deposits is not very swift. The customer cannot withdraw his/her funds placed with bank without any prior notice. Early withdrawal often carries additional charges and subject to some penalties.

Short-term interest bearing deposits

These deposits include 1-3 year deposits but unlike long-term deposits, they carry variable interest rates. Since the rates are variable, it means with change in policy rate by central bank, the interest rate on the deposits will also vary. Their withdrawal like long-term deposits is also subject to some penalties but generally it varies from bank to banks. Moreover, customer cannot withdraw his/her funds placed with bank without any prior notice.

Non-remunerative accounts

These bank accounts are often called current accounts. These account doesnot carry accrueany interest on the deposits. As far as cost of the deposits is concerned, these are ideal for any bank in the world. But the risk with such deposits is customer can withdraw his/her funds placed with bank without any prior notice.

What can exactly happen to deposits in covid-19.

In Pakistan, we are still a cash based economy. People mostly have cash which they deposit in their banks. Similarly, they go to bank or use ATM to withdraw the cash for daily use like buying milk, egg, yogurt and other daily used items. Similarly, salary paid by household to maids, drivers etc., are in cash. Sometimes in shopping malls, we prefer to have shopping via cash and we avoid using ATMs/ Credit cards. Moreover, some people also do not trust the banking system in Pakistan and fear to deposit their funds in the banks. Currently, total deposits of the banking system of Pakistan stood at Rs. 13.9 trillion as of March 31st, 2020. But these deposits are subject to some risks highlighted below:

a. Since there is partial lock-down in the country. People will avoid to deposit further money in the banks. Rather, they would prefer to hold money. This would mean that deposits of the banking system would not be increasing the upcoming months.
b. Those who have already funds in their banks, might need to use their saving to finance the current expenditures. This may be the case with people who either lost their jobs or want to help other family members in family and current amount of income is not sufficient to finance people in extended family. This shows that deposits of the banking system would reduce.
c. Remittances, which average around USD 18-19 billion per year for our country would decline sharply in current scenario and hence deaccelerate the deposit growth.

How covid-19 would impact advances

Total advances of banking system stood at Rs. 8.4 trillion. Out of this Rs. 2.4 trillion advances (almost 29 percent) have maturity of six months. The analysis on the advances side shows that Rs. 1.3 trillion advances would mature in 1-3 months while Rs. 1.1 trillion would mature in 3-6 months' period. This means that borrowers of the funds would be facing severe challenges in the coming months to payback these loans to the banks in back drop of the ongoing pandemic. If borrowers fail to pay half of these liabilities this would mean Non Performing Loans(NPLs) of the banking system would arise by Rs. 1.2 trillion. This would mean that NPLs of banking system would increase from Rs. 792 billion in March 2020 to Rs. 1,992 billion in next two quarters. This would deteriorate the infection ratio from 8.2% to 17.9 percent far beyond the threshold requirement of 10.0 percent. This would in turn pose serious Asset –Liability mismatch to the banks and may might trigger a liquidity risk.

Forecasting the crisis, the SBP has announced few schemes:(SBP, Impact of COVID-19, 2020)

a. Cut the Policy rate by 475 bps in just 31 daysi.e. from 13.25 pc on March 16 to 9.00 pc on April 16.
b. Federal Government has apportionedfor the banks Rs. 30 billion,to share their credit risk i.e. the losses emerged due to bad loans (credit defaults) in the future. In this facility the Government would share 40.0 percent of first loss on the amount of the loan (principal) disbursed by the banks.
c. Establishing COVID-19 relief fund
d. Supporting health sector to Combat COVID-19 at 3 pc. As of May 4, 2020, Rs. 2.20 billion of loans were approved for eleven medical facilities and hospitals whereasthe applications of financing amount worth Rs 3.60 billion were under the banks' review.
e. Ensuring availability and continuity of financial services.
f. Relaxing credit requirement of importers and exporters.
g. Provision of disinfected currencies notes by banks
h. Salary loan at 3-5 percent to the Employers

But all these measures do not directly facilitate the needy segment of the economy. These policies only look to facilitate big businesses, exporters and those who already are exploiting the resources of the country. For example, Gul Ahmed Textile has laid off 321 employees of its 15,000 workforce but at the same time it has availed the financing facility from the SBP.

The summary of the whole scenario is the central bank has rightly started offering refinance schemes to address the issue of real sector of the economy. The interest rates are also in single digit but the issue is banks are so far not provided any relief. The purpose here is not to provide banks with easy money but the issue is a dire need to analyze their liquidity and assess the risks which banks are facing.

The banking sector of Pakistan house 207,631 employees. It is the sector which manages 85 percent of the liquidity (cash) of the country. If news of liquidity issues pertaining to any bank gets on-air it will effect the whole banking system, which in turn would lead to run of banks. Such situation when triggers, literature suggest that things slip quickly from the hand regulators and the government and the whole system collapse in no time because the foundation of the banking system lies in the confidence of its client. Once the confidence of customer on the bank diminishes the stability of the banking system become questionable. The key to the confidence and sound banking system is its stable liquidity outlook i.e. its ability to pay its short-run and long-run obligations.

The following table shows list for foreign, local and specialized banks operating in Pakistan, along with numbers of employees serving.

SR.	Bank Names	Full time Equivalent Employees	Branches
1.	National Bank of Pakistan	14,873	1,530
2.	First Women Bank	495	42
3.	Bank of Punjab	10,564	595
4.	Bank of Khyber	2,211	167
5.	Sindh Bank	2,377	330
	Public Sector Commercial Banks (PSCB)	30,520	2,664
6.	Punjab Provincial Cooperative Bank (PPCB)	1,811	151
7.	ZTBL	5,254	502
8.	SME Bank	481	-
	Specialized Banks (SB)	7,546	653
9.	Allied Bank	16,832	1,345
10.	Bank Al Falah	12,390	672
11.	Askari Bank	9,755	517
12.	Bank Al Habib	14,129	747
13.	Samba	905	-
14.	Faysal Bank	6,938	38
15.	HBL	24,865	-
16.	Summit Bank	2,052	487
17.	JS Bank	5,113	1,719
18.	MCB	19,475	-
19.	MCB - Islamic	2,185	193
20.	UBL	19,489	345
21.	Metro	5,038	1,393
22.	Bank Islamic	4,103	178
23.	Soneri	3,093	1,377
24.	Silk	4,433	-

25.	Meezan	11,649	371
26.	Dubai Islamic Bank	3,095	330
27.	Standard Chartered Bank	2,823	-
28.	AL Baraka	2,644	296
	Local Private Banks (LPB)	171,006	12,300
29.	Citi	234	1
30.	Deutche	94	3
31.	Tokyo	19	2
32.	Bank of China	49	1
33.	ICBC	115	3
	Foreign Banks (FB)	511	10
	All	**209,583**	**13,704**

LITERATURE REVIEW

Cecchetti and Kim Schoenholtz highlighted their concern about the fact that crisis often expose banks to certain risks due to decline in level of confidence on financial sector. (Schoenholtz, 2020). Some financial experts say that keeping in view the contagious nature, the bank runs have dominoeffect on the whole financial system. Thus, the news about a run on a specific bank alerts everyone to the fact that there may be other 'lemons'(banks) among the universe of banks, turning a run in to a panic. If people are ill-informed, shocks can cause them act in ways that amplify disturbances. If there is not transparent and honest government communication about the facts pertaining to the crisis, the lack of information may simply multiply the impact of the shocks. (Nove, 2019)

With the decline in the confidence level of businesses and general public along with disturbances in the liquidity position, the firms would be considered as more vulnerable. The IMF (2019) has raised the flag that due to accommodative financial conditions for a prolonged period, there is an increase in the urge of investors to earn high yields, and as a result institutional investors with high return(nominal) objectives have parked their funds in riskier and more illiquid assets. According to the IMF Global Financial Stability Report of October 2019, highlights that the risks in Non-Banking Financial Institutions(NBFIs) and other nonfinancial companies in systematically important countries are at alarming levels (historic high). Thus, if during the crisis financing of such entities were affected, these entities could be in trouble and might lead to wave of another economic crisis.

John Cochrane's, (Cochrane, 2020) his article takes a strong and bold stanceon this current financial situation, asking "What happens if the economy shuts down for a few weeks or months, either by choice or by public-health mandate?" He latter states that

"Shutting down the economy is not like shutting down a light bulb. It's more like shutting down a nuclear reactor. You need to do it slowly and carefully or it melts down."

Although, Cochrane does not provide estimates but he shared his concerns about the complex nature of financial problems in the making i.e. decline in the aggregate demand, lack of businesses' ability to pay off their debts and pay-off their employees (including factory workers).He has also highlighted that such situation might trigger broad based bankruptcy among businesses and common households.

The implications are very much evident now. The supply side shocks of the Pandemic (COVID-19) has resulted in the closure of boarders, impacting exports, imposing ban on the travels, restriction on the labour to attend factories, decline in the general outputlevel. This has also started to ring bells for the banks to restructure their debt and manage their liquidity smartly to avoid any bank-run (Abbas et al., 2020; Abbasi et al., 2020; Sulman, 2020).

The empirical evidences mentioned in the literature suggest that there is very low probability a severe flu (like Spanish flu which affected the world in three waves during 1918-1920) would come again in the same year. The World Bank report on the impact of Pandemics on the Gross National Income suggest a decline in the range of 4-5 percent in the year the Pandemic hits. Based on the available data, if we average-out the impact it can be concluded that on average 700,000 people die every year with average annual morality cost of around USD 490.0 billion (Victoria Y. Fan, 2016; Ahmad et al., 2018; Al-Kumain et al., 2020). The pandemic related to influenza due to their very nature of being contagious lead to an increase in the cost of doing business; a shift in preferences of the consumer, and a reevaluation of risks pertaining to the countryand most importantly fall in the labor force but this varies with region to region due to difference in mortality rates and illness. It was concluded that even global economies might get significantly affected by even a mild wave of Pandemics. Further, it was estimated that the in case of mild Pandemic, 1.4 million would lose their lives worldwide and it would reduce the world GDP by 0.8 percent. Such situation might also lead to bankruptcy and serious liquidity risks to the banks.

The lending institutions are affected badly due to novel Coronavirus. The primary reason is the economic melt-down triggered by negative development in the businesses; decline in their sales, profits, ability to payback their loans and increased level of unemployment. However, central banks across the globe are monitoring the liquidity position of their banks to extend financing facility to the trouble banks. The businesses have already started to get financial relief, and the Federal Reserve Bank in the U.S. are encouraging banks to help them as Fed is providing liquidity to its banks to stay stable during the pandemic(Alhem, 2020; Arshad et al., 2020; Ashraf et al., 2020)

We have not yet stopped talking about the Global Financial Crisis (GFC) and here in 2020 we are facing another crisis which is considered severer than GFC.The major economies of the world have already seemed to exhausted their resources in

road map to recovery form the GFC. They have kept on putting money in their institutions to make them stable. Some of the European countries have kept the interest rate negative to facilitate the economic activity. The data of European Central Bank (ECB) suggest that currently, only three economies; Germany, Netherlands and Malta have improved debt to GDP ratio than compared to GFC, 2008. Thus, most of the European countries would have limited ability to come up with strong financial support plans to overcome the Pandemics. Moreover, with prolong lock-down across the globe, there will be soon a lot businesses finding it hard to pay –off their loans and the situation may trigger another financial crisis, if liquidity of the banking system is not dealt in time (Balakrishnan et al., 2019; Jabarullah et al., 2019; Zink, 2020).

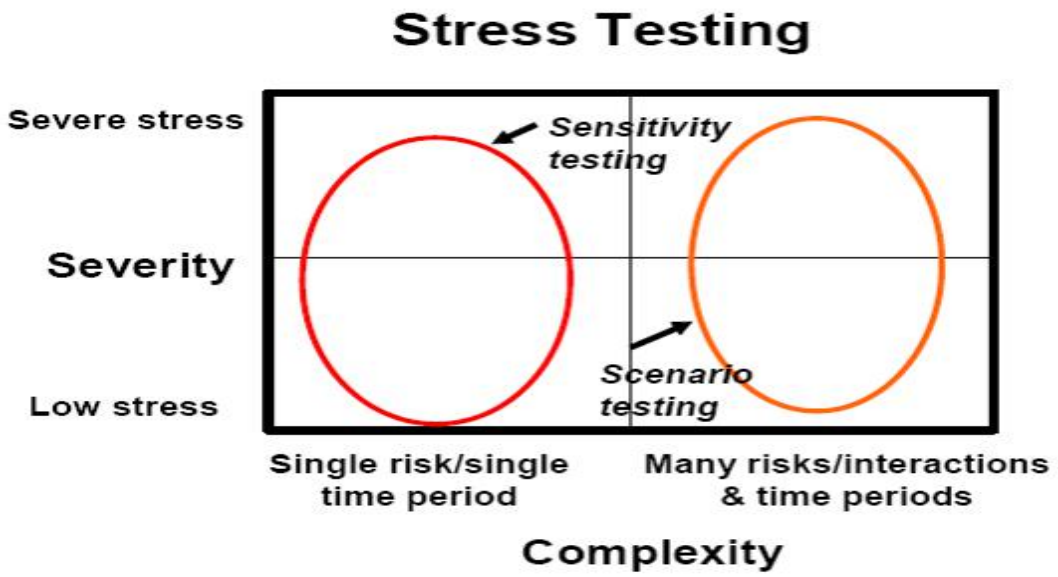
If the COVID-19 crisis last for more than a quarter it would have serious consequences on the stability of the banking sector and without the intervention of the Governments and the Central Banks it would be difficult for banks to sustain for long keeping in view the credit risks and liquidity risks. For example, the primary source of income for any banks is the interest income it earns on its loans given to the customers. In current situation, if banks would not be able to recover their payments in time, it would lead to liquidity shortages and banks would find it difficult to refinance themselves from interbank market due to high cost of funds prevailing there(in back drop of liquidity shortage). (stiller, 2020)

S&P Global Ratings said that the banks are likely to experience a uptick in the ratio of their non-performing assets by 1.9 per cent, similarly, the credit cost ratios are expected to increase by 130 basis point in 2020, on account of slow-down triggered due to COVID-19 crisis. Further, the banks will face a decline in the deposits which will trigger a liquidity crisis in the banking sector, which need immediate attention of the central bank.(Abel, 2020)

The world bank in its report on Pakistan suggested that “This will deepen the economic pain we already anticipate for CY20. Financing conditions may likewise sour as investors become more risk averse. This would hit bank credit,". The report highlighted that NPLs would increase by Rs. 600 billion in CY20 due to the impact of COVID-19c. This will lead to liquidity crunch in the banking sector”

METHODOLOGY

Based on the literature review stress testing methodology is being used, as adopted by Martin during by performing stress testing on liquidity of the banks during 2009 Avian flu. The stress testing is Assessment of the vulnerability of a financial institution or the entire system to exceptional but plausible events. This methodology got fame after 2008 global financial crisis. My stress testing mechanism is as under:



I have divided the stress testing into two halves:

a. Sensitivity Testing
b. Scenario Testing

Sensitivity testing

Sensitivity analysis is a financial model that estimates the impact of changes in the certain variables (input variables) on the target variable (i.e. variable under study). This model is also known as simulation **analysis**. Here, the purpose of sensitivity analysis is to find the trouble banks in the banking sector of Pakistan based on the liquidity analysis.

Classification	**Criteria**
Critical	**If pre-shock CAR is below domestic regulatory benchmark for banks/DFIs/IBs.**
Solvency Watch List	**If post-shock CAR is below 10 percent for banks/DFIs/IBs.**
Liquidity Watch List	**If a bank/DFI/IBs is highlighted in any liquidity scenario or if LCR is below 1**

What is Capital Adequacy Ratio (CAR)?

It is a ratio of 'capital to risk weighted assets'. The regulatory requirement of CAR is 10.0. This depicts the ability of the bank to absorb the shock implied by rate sensitive assets. For maintaining a ratio at reasonable level, banks have to increase their asset quality. The concept of CAR was introduced in Basel III after GFC in 2008. The sensitivity testing will be applied on all the banks on the latest data available i.e. December 2019. As per SECP requirement all registered companies, issue their financials within 45 days after the quarter ends. So, first quarter numbers will be available after May 15, 2020.

Scenario analysis

Assesses the impact of a given shock scenario (risk factors).
Three scenarios are being evaluated
Baseline Scenario: Business as usual
Historical Scenario: Replicate historically adverse economic conditions to current state of economy
Hypothetical Stressed Scenario: on the basis of current risks to which domestic economy is exposed.
1. 30%loans default,
2. 50% loans default
3. and 70% loans default.
The rationale of these scenario is mentioned below.
Before starting the analysis, just analyze the sector wise distribution of all the loans of the banking sector of Pakistan.

Concentration of Funds (current quarter)	**Advances**	
	Amount in millions	
Chemical and Pharmaceuticals	311,429.1	3.5%
Agribusiness	704,869.1	7.9%
Textile	1,205,711.3	13.6%
Cement	190,559.1	2.1%
Sugar	220,988.2	2.5%
Shoes and leather garments	38,634.4	0.4%
Automobile and transportation equipment	176,934.5	2.0%
Financial	252,057.7	2.8%
Insurance	4,299.5	0.0%

Electronics and electrical appliances	120,193.3	1.4%
Production and transmission of energy	1,492,818.5	16.8%
Individuals	763,625.2	8.6%
Others	3,386,624.1	38.2%
Total	**8,868,743.9**	**100.0%**

Source: Gathered from each bank.

Total Outstanding loan is worth Rs. 8.86 trillion. The 13.6 percent of this amount which means Rs. 1.2 trillion is concentrated in the textile sector. Moreover, almost 6 percent of the portfolio is concentrated in Shoes, automobile, electronics industry, while another 8.0 percent is private lending to the individuals. Now in COVID-19, our textile sector is adversely affected, export orders were not materialized, local sales are diminished. Latest LSM data shows that electronics and leather goods industry has negative growth (SBP, Trends and Development March 2020). Similarly, due to pandemic, the individual is affected, apart from permanent government employees, jobs of most of the people are at stake and if they are borrowers of the bank loans. It would be very difficult for them to payback their loans. This in total accounts for almost 29.0 percent of total loans of banking sector of Pakistan. Thus, almost Rs. 2.1 trillion worth loan can be at risk. Thus, above scenario is formed on these bases. Detailed analysis is as under:

Capital Adequacy Ratio (CAR)

				50 PERCENT RWA EXPOSED FULLY	**70 PERCENT RWA EXPOSED FULLY**
National Bank of Pakistan	15.9%	12.4%	10.2%	8.2	6.2
First Women Bank	34.8%	32.9%	30.9%	28	26.2
Bank of Punjab	14.6%	11.3%	9.8%	6.8	4.8
Bank of Khyber	15.2%	15.2%	13.8%	10.8	8.7
Sindh Bank	13.1%	13.1%	11.8%	9.8	8.6
Public	15.6%	12.5%	10.2	9.4	7.8

Sector Commercial Banks (PSCB)					
Punjab Provincial Cooperative Bank (PPCB)	56.3%	36.9%	22.2%	18.9	11.4
ZTBL	35.3%	33.2%	31.2%	28.9	26.8
SME Bank	-89.9%	-89.9%	-113.3%	-122	-131.2
Specialized Banks (SB)	35.4%	31.8%	22.2%	18.2	14.2
Allied Bank	22.0%	16.9%	14.2%	10.8	9.1
Bank Al Falah	17.0%	13.4%	11.8	9.8	8.1
Askari Bank	13.2%	11.3%	10.2	8.8	6.1
Bank Al Habib	14.2%	11.2%	9.8	8.1	7.4
Samba	18.2%	17.7%	15	12.2	10.8
Faysal Bank	17.7%	15.7%	13.7	11.8	10.2
HBL	17.3%	13.9%	12.1	10.1	8.4
Summit Bank	-25.2%	-25.2%	-37.5	-42.5	-52.5
JS Bank	12.9%	10.3%	8.9	7.1	4.9
MCB	18.8%	15.6%	12.52	10.2	8.7
MCB - Islamic	14.1%	13.4%	11.3	10.1	9.1
UBL	18.8%	14.8%	13.1	12.8	10.8
Metro	14.6%	14.1%	11.8	7.8	8.4
Bank Islamic	13.7%	10.4%	9.2	7.8	6.1
Soneri	16.2%	13.4%	11.8	9.9	7.1
Silk	8.9%	6.5%	4.5	3.2	-1.1
Meezan	15.7%	13.1%	10.9	8.9	7.1
Dubai Islamic Bank	17.1%	14.0%	11.2	9.9	7.2
Standard Chartered Bank	17.3%	15.3%	13.8	11.7	10.9
AL Baraka	13.3%	10.6%	9.6	7.7	6.4
Local	16.4%	13.4%	10.8	8.2	7.1

Private Banks (LPB)					
Citi	22.6%	22.4%	22.1	22.1	22.1
Deutche	29.6%	29.6%	29.2	28.1	27.3
Tokyo	484.2%	484.2%	484.2	484.2	484.2
Bank of China	62.5%	62.5%	62.5	62.5	62.5
ICBC	26.0%	25.7%	24.2	24.0	23.1
Foreign Banks (FB)	29.0%	28.8%	28.6	28.2	27.2
All	17.0%	14.0%	11.6	11.4	11.1

The stress testing performed on CAR of all the banks of the banking sector of Pakistan suggest that at baseline only Silk, Summit and SME bank are in critical situation, as their CAR is below the regulatory requirement of 10.0 percent before any stress testing. In case of CAR based on Tier 1 capital, which comprised of core capital, all banks except these banks remain solvent. But when the banks were stress at different levels results are summarized in the table

Classification	**Criteria**
Critical	**Summit bank** **Silk Bank** **SME Bank**
Solvency Watch List	**30 Percent Scenario:**Summit bank, Silk Bank, SME Bank, Bank Islamic, AL Baraka and JS Bank **50 Percent Scenario:** Out of 33, 17 banks come on solvency watch list **70 Percent Scenario:** Out of 33, 21 banks come on solvency watch list
Liquidity Watch List	**If a bank/DFI/IBs is highlighted in any liquidity scenario or if LCR is below 1**

LIQUIDITY ANALYSIS

For liquidity analysis, the methodology of CAMEL (Capital, Asset, Management, Earning and Liquidity) was followed. The CAMEL technique was developed and tested first in USA in late 1980's. The Goredo and Jack(2009) also used this approach to stress test the different banks of USA during the GFC in 2008. The scale of testing is as under:

	BENCHMARK FOR RATING				
Ratio	1	2	3	4	5

Loan to Deposit	>70%	>50%	>30%	>20%	<=20%
Liquid Assets to Total Assets	>80%	>60%	>40%	>20%	<=20%
Liquid Asset to Total Deposit	>=100%	>70% but below 100%	>50% but <70%	>20% but < 50%	>=1%
LCR	Rule of Thumb is ratio must be greater than 1				

Based on these scales following are results:

	A	B	C	D	E	F	G	H
	Liabilities Maturing within 3 month	Assets Maturing within 3 month	Loans to Deposits					Asset Liability Mismatch in short run A/B(LC
National Bank of Pakistan	1,357,274	803,102	45.93%	12.4%	55.2%	78.9%	89.8%	0.59
First Women Bank	2,584	14,347	57.66%	15.9%	49.4%	66.1%	177.6%	5.55
Bank of Punjab	325,250	211,536	55.53%	11.9%	49.4%	64.1%	77.4%	0.65
Bank of Khyber	275,868	133,648	60.24%	4.4%	58.3%	103.3 %	63.5%	0.48
Sindh Bank	55,987	57,265	45.67%	44.2%	46.9%	58.4%	52.8%	1.02
Public Sector Commercial Banks (PSCB)	2,016,964	1,219,898	265.03%	13.2%	53.9%	76.2%	83.1%	0.60
Punjab Provincial Cooperative Bank (PPCB)	3,355	5,007	225.42%	19.7%	16.4%	80.7%	85.4%	1.49
ZTBL			272.98%	33.2%	23.5%	108.5	71.7%	

	36,743	93,132				%		2.53
SME Bank	7,052	2,383	25.44%	75.3%	65.2%	83.3%	66.9%	0.34
Specialized Banks (SB)	47,149	100,521	202.00%	34.1%	24.4%	103.0 %	71.9%	2.13
Allied Bank	534,450	625,662	46.24%	3.1%	57.1%	80.6%	118.4%	1.17
Bank Al Falah	237,764	517,968	65.35%	3.9%	39.5%	53.6%	101.6%	2.18
Askari Bank	221,909	232,401	54.90%	7.1%	44.8%	54.9%	122.1%	1.05
Bank Al Habib	481,985	427,814	54.07%	1.5%	55.0%	77.2%	98.6%	0.89
Samba	56,223	42,304	85.51%	4.2%	43.7%	78.3%	60.8%	0.75
Faysal Bank	160,373	265,613	67.62%	9.1%	32.1%	43.7%	79.2%	1.66
HBL	699,702	834,452	46.65%	6.3%	53.7%	71.2%	151.2%	1.19
Summit Bank	95,994	48,659	49.36%	53.9%	25.8%	30.5%	25.5%	0.51
JS Bank	167,644	222,420	65.70%	4.2%	41.2%	51.9%	66.3%	1.33
MCB	261,991	575,041	43.39%	9.2%	55.8%	74.5%	211.9%	2.19
MCB - Islamic	25,154	42,834	62.69%	0.7%	27.2%	34.8%	86.1%	1.70
UBL	494,220	691,592	43.20%	10.9%	53.4%	68.4%	120.9%	1.40
Habib Metro	394,506	290,223	43.12%	6.2%	59.8%	83.9%	70.3%	0.74
Bank Islamic	74,772	98,010	57.65%	10.5%	23.9%	29.9%	55.9%	1.31
Soneri	208,505	135,270	67.84%	5.1%	46.9%	68.1%	61.6%	0.65
Silk	59,549	43,028	71.57%	30.0%	31.3%	43.9%	65.8%	0.72
Meezan	246,497	420,755	53.16%	1.6%	19.5%	23.3%	52.2%	1.71
Dubai Islamic Bank	48,687	70,612	84.74%	2.5%	13.9%	17.4%	31.5%	1.45
Standard Chartered	135,994	392,277	46.84%	7.5%	51.7%	68.2%	130.6%	2.88

Bank								
AL Baraka	51,402	73,490	58.19%	11.4%	20.5%	25.7%	38.4%	1.43
Local Private Banks (LPB)	4,657,319	6,050,424	61.00%	6.9%	47.3%	62.7%	105.6%	1.30
Citi	49,411	46,234	45.81%	4.9%	62.1%	80.5%	166.0%	0.94
Deutche	19,072	24,558	45.06%	1.0%	67.6%	111.4%	86.4%	1.29
Tokyo	85	483	0.00%	1.2%	99.2%	140.0%	5078.6%	5.66
Bank of China	18,210	17,338	4.90%	0.0%	84.7%	130.6%	121.3%	0.95
ICBC	467,407	260,443	30.87%	0.0%	93.3%	498.9%	100.8%	0.56
Foreign Banks (FB)	554,185	349,056	29.00%	2.9%	85.4%	249.5%	107.8%	0.63
All	7,275,617	7,719,898	57.00%	8.6%	49.7%	68.4%	99.4%	1.06

RATING TABLE:

BANK NAMES	Rating on Loan to Deposit Ratio	Rating on Liquid Assets/ Total Asset	Rating on Liquid Assets/ Total Deposits	Total	Stress at 30%	Stress at 50%
National Bank of Pakistan	3	3	2	2.67	3.47	4
First Women Bank	2	3	3	2.67	3.47	4
Bank of Punjab	2	3	3	2.67	3.47	4
Bank of Khyber	2	3	1	2.00	2.60	3
Sindh Bank	3	3	3	3.00	3.90	5
Public Sector Commercial Banks	**1**	3	**2**	2.00	2.60	3

(PSCB)						
Punjab Provincial Cooperative Bank (PPCB)	1	3	2	2.00	2.60	3
ZTBL	1	3	1	1.67	2.17	3
SME Bank	4	2	2	2.67	3.47	4
Specialized Banks (SB)	**1**	**4**	**1**	2.00	2.60	3
Allied Bank	3	3	2	2.67	3.47	4
Bank Al Falah	2	3	3	2.67	3.47	4
Askari Bank	2	3	3	2.67	3.47	4
Bank Al Habib	2	3	2	2.33	3.03	4
Samba	1	3	2	2.00	2.60	3
Faysal Bank	2	2	1	1.67	2.17	3
HBL	3	3	2	2.67	3.47	4
Summit Bank	3	4	4	3.67	4.77	5
JS Bank	2	3	3	2.67	3.47	4
MCB	3	3	2	2.67	3.47	4
MCB - Islamic	2	4	4	3.33	4.33	5
UBL	3	3	3	3.00	3.90	5
Metro	3	3	2	2.67	3.47	4
Bank Islamic	2	4	4	3.33	4.33	5
Soneri	2	3	3	2.67	3.47	4
Silk	1	4	4	3.00	3.90	5
Meezan	2	3	4	3.00	3.90	5

Dubai Islamic Bank	1	5	5	3.67	4.77	5
Standard Chartered Bank	2	2	3	2.33	3.03	4
AL Baraka	2	3	4	3.00	3.90	5
Local Private Banks (LPB)	**2**	**3**	**3**	2.67	3.47	4
Citi	3	2	2	2.33	3.03	4
Deutche	3	2	1	2.00	2.60	3
Tokyo		1	1	0.67	0.87	1
Bank of China	5	1	1	2.33	3.03	4
ICBC	4	1	1	2.00	2.60	3
Foreign Banks (FB)	**4**	**1**	**1**	2.00	2.60	3
All	**2**	**3**	**3**	2.67	3.47	4

RESULTS

The results suggest that except the foreign banks, all the bank are vulnerable to liquidity risks even at first shock. The first shock is that 30 percent of the bank loans given to corporates/ individual suffer default. If such situation happens these banks would face the liquidity risk and this liquidity crunch would be vulnerable for the banking sector as whole.

SUMMARY

Banks vulnerable due to short-term Asset Liability mismatch identified by LCR are, National Bank, BoP, BoK, Samba, Summit, Silk, Habib Metro Soneri and Bank Al Habib. These banks are vulnerable at even baseline.

On overall basis, the rating scale suggest that Sind bank, Summit bank, Samba Bank, JS bank, MCB, UBL, Meezan, DIB and AL Baraka are vulnerable even a baseline.

Stress testing suggest that only Faysal Bank, Allied Bank and Standard Chartered Bank are secured banks in terms of stable liquidity outlook. All other banks except foreign banks are vulnerable to small liquidity shocks.

CONCLUSION AND POLICY RECOMMENDATION

Small change in bank data may take seriously because the problem has raised to level that its now affecting top brass of economy like big corporates, financially stable individuals. In case of Europe you may get the exact impulse of the economy by looking at the banking indicators as almost 90 to 100 percent people are using banking channels to conduct transaction and have formal bank accounts. But this is not the case in Pakistan, only 16 percent people have banking account and out of it 2 percent people use facilities like bank loans, credit card etc. So, based on vulnerability of the banks, it is hereby recommended that SBP should act proactively to fix the liquidity issues of the banks. They have introduced schemes to defer the payments of the loan. But these efforts will only defer the bankruptcy of the corporate and individual in the hope of better financial forecast of the next quarter. The research hereby raises the flag that almost all banks are vulnerable to liquidity risk, if we assume there 30 percent loans are default by their clients.

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