2021 BOK Knowledge Partnership Program

with **Nepal**

*Financial stability: challenges and opportunities
in the post-Covid context*

2021 BOK Knowledge Partnership Program with Nepal

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BANK OF KOREA   SUNG KYUN KWAN UNIVERSITY (SKKU)   NEPAL RASTRA BANK

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Executive Summary

Nepal economy, which is heavily dependent on high-contact industries such as tourism and remittance from the workers abroad, is one of the hardest hit economy by the Covid19 crisis, that caused the sudden and simultaneous physical disconnection of demand and supply channels of high-contact industries. In this context, this project tried to identify the structural features of the Covid19 economic crisis in general, and the impact of the crisis on the Nepal economy and the social structure. In addition, via close collaboration of the Nepal Rastra Bank research team and KPP-SKKU research team, this project examines the impact of the Covid19 crisis on the financial stability of Nepal in short-term focusing on the latest available data and the long-term future prospect of the financial stability based on an econometric estimation. In addition, the macroprudential policy agenda were studied focusing on the short-term best responses to the financial market development just after the onslaught of the Covid19 crisis, and the long-term direction of macroprudential policies based on econometric estimation of the policy effectiveness.

Although the Nepal economy can be construed as the hardest hit victim of the Covid19 crisis, the strategic chances to transform the Nepal financial systems are examined in addition to the challenges facing the current Nepal financial system. Based on the case studies and the structural analysis of the exemplar policy efforts to recover financial stability after the Covid19 crisis, this project identifies the future policy direction to improve the financial stability in Nepal. Considering the dynamic feature of the Nepal economy and financial systems, the strategic role of financial regulatory polices as an integral part of economic developmental policies is considered as a new core factor of financial stability issues in Nepal.

Overall, it is estimated that the stability of Nepal financial system has been well managed with the active policy intervention by the Nepal financial authorities. Facing the future external shocks, it is recommended that the Nepal financial authorities keep consistent approaches in macroprudential policies focusing on providing stable environments for economic growth and building industrial competitiveness instead of adopting sudden policy changes.

I. Introduction

Covid19 economic crisis is characterized as an extremely asymmetric shock in terms of industry-wise asymmetry and country-wise asymmetry mainly damaging 'high-contact industries.' In that context, Nepal economy and the financial market is considered as one of the hardest hit economy by Covid19 shock, since Nepal is heavily dependent on 'high-contact' industries as tourism and remittance from workers employed in foreign countries. Motivated by the high vulnerability of the Nepal economy and the financial system to the Covid19 shocks, this KPP project targets to identify the urgent policy agenda for financial stability in Nepal after Covid19 crisis, and the policy implications for short-term and long-term policy measures to recover financial stability in Nepal.

Based on the intense discussions between NRB (Nepal Rastra Bank) research team (led by Dir. Kiran Pandit) and BOK-KPP team (led by Young-Han Kim, Sungkyunkwan University), the concrete research agenda were boiled down to 4 topics from the following original 10 topics proposed by NRB during the KPP preliminary meeting on April 28, 2021: i) Impacts on mortgages and housing market, ii) Challenges in the non-bank sector, iii) Short term and long term impact and policy prescription, iv) Forecasting methodology and early warning signal, v) Various challenges and opportunities in the financial system and a way forward, vi) Interlinkages between BFIs and other financial institutions and systemic risk, vii) Macroprudential Issues post-Covid, viii) Global Best Practices post-Covid, ix) Payment System post-Covid, x) Financial Consumer Protection post-Covid.

Driven by the necessity to find strategically urgent policy agenda and more structured analysis on policy priorities for financial stability in Nepal after the Covid19 shock, NRB research team and BOK-KPP team agreed to focus on the following 4 topics: i) Covid19's impacts on financial stability in Nepal, ii) Macro-prudential policy agenda after Covid19 in Nepal, iii) Challenges and opportunities in the financial system of Nepal after Covid19, iv) Global best practices for financial stability after Covid19.

Motivated by the focused research agenda, NRB research team and the KPP-SKKU

research team formed 4 sub-research teams to analyze i) the structural features of COvid19 economic crisis and its impact on Nepal economy and financial structures, ii) the impacts of Covid19 on financial stability in Nepal, iii) macroprudential policy agenda after Covid19 in Nepal, and iv) challenges and opportunities in the financial system and a way forward after Covid19 in Nepal as noted in details in the end of the report. Based on the team research activities, the general direction of the researches and research methodologies were discussed and confirmed via the Kick-off seminar on June 30, 2021.

Focusing on the structural features of Covid19 economic crisis such as the simultaneous physical disconnection of supply chains and demand chains, the Nepal economy can be construed as the one of the hardest hit economy due to the heavy dependency on 'high-contact industries' such as tourism industries and remittance from workers abroad mainly in service sectors. Nevertheless, the general trends of the financial markets in Nepal after the Covid19 crisis have shown relative stability with non-performing loans and private sectors' debts staying within stable ranges due to active relief measures taken by NRB and the Nepal government.

This KPP project focuses on the future direction of policy measures for financial stability in Nepal that can facilitate the future economic developmental efforts at the government level and private level. Under this big target, the KPP project with NRB tries to develop an econometric forecasting model for financial stability and accompanying model of early warning system for possible financial instability. Based on these works, this study identifies the challenges and opportunities in the financial system of Nepal after Covid19 and a way forward to financial stability after considering the best and worst practices for financial stability.

Throughout the collaborative studies between NRB and KPP-SKKU research teams, the focus was given to identify the structural features of the Nepal-specific financial system, and the optimal policy measures for Nepal-specific financial stability to find a realistic policy path for financial stability in Nepal that can provide stable stepping stones for vibrant economic development and growth in Nepal.

Details of the research collaboration between NRB research team and KPP-SKKU team

are given as follows:

Topics	Authors
I. Introduction	Young-Han Kim
II. The impacts of Covid19 on Nepal economy	
1. The structural features of the Covid19 economic shock	Young-Han Kim
2. The impacts of Covid19 on Nepal economy	Kiran Pandit and Subash Acharya
III. Covid19's short term and long term impacts on financial stability and policy prescription	
1. Covid19's short term impacts on financial stability in Nepal	Siddha Raj Bhatta and Tika Ram Timilsina
2. Covid19's long term impacts on financial stability in Nepal	Cheol-Keun Cho
IV. Optimal macroprudential policy approaches after Covid19 in Nepal	
1. Short term macroprudential policy agenda after Covid19 in Nepal	Siddha Raj Bhatta and Tika Ram Timilsina
2. Long term macroprudential policy agenda after Covid19 in Nepal	Dooyeon Cho
V. Challenges and opportunities in the financial system and a way forward after Covid19 in Nepal	
1. Challenges and opportunities in the financial system of Nepal after Covid19	Subash Acharya and Pratikshya Rijal
2. Global best practices for financial stability after Covid19	Tae Bong Kim
VI. Conclusions	Young-Han Kim

II. The impacts of Covid19 on Nepal economy

1. The structural features of the Covid19 economic shock

A. Structural difference of Coivd19 crisis from the earlier economic crises

While Covid19 crisis is considered as an unprecedented economic crisis in terms of the scale and the severity of the economic shocks, more concrete analysis of the structural features of the Covid19 crisis is required to derive proper policy reactions with respect to the health crisis. To characterize the Covid19 crisis, it would be helpful to compare the Covid19 crisis with the global economic crisis in 2008 and the earlier crises starting from the Great Depression in the last century.

(1) Structural features of the earlier economic shock: Demand-driven shock after the collapse of asset bubbles

The global economic crisis in 2008 and the majority of the earlier economic crises including the Great Depression in the early 30s of 20th century are defined as demand-driven crises after the collapse of the asset bubbles. The typical pattern of the financial and economic crisis is the initial accumulation of the asset bubbles mainly due to the herd behavior strategy, which is considered as the optimal investment strategy in speculative asset markets, where the maximum arbitrage profits are considered as the single and divine target.

The natural result of the herd behaviors of the speculative investors is to reach the threshold level after which, the asset bubbles are destined to collapse with no exception. Then, the next stage is the convulsive contraction of demands after the bubble collapse with the liquidity crisis that is eventually multiplied to a serious negative shock to the real sector, i.e., the supply chains.

After the repeated experiences of the demand-driven shocks following the collapse of the asset bubbles since early 1980s, the following policy packages became widely accepted measures to contain the contagion of the economic crisis with the psychological phobia in the market after the collapse of the asset bubbles. i) The massive expansionary monetary policies as quantitative easing (QE) and ii) expansionary fiscal policies that can over-ride the convulsive contraction of demand are the cornerstones to recoup the economic vitality before the crisis.

Additional feature of the earlier economic crises is that the economic shocks after the collapse of the asset bubbles were spread to all economic sectors and all major economies almost with no exception mainly through the rapid psychological contagion effects with the deepened global economic interconnection through the global value chains and supply chains.

(2) Covid19 crisis: Simultaneous physical disconnections of supply chains and demand chains and asymmetric shocks

Contrarily, Covid19 crisis is characterized as a totally different type of crisis, i.e., a crisis caused by the simultaneous physical disconnections in supply chains and demand chains having nothing to do with asset bubbles. In that context, while the earlier economic crises are labeled as endogenous crisis since the financial speculators formed the asset bubbles eventually causing the crisis, the Covid19 crisis is described as purely exogenous crisis.[1] Therefore, the economic damages caused by Covid19 such as frequent and unpredictable lockdowns that physically close down supply and demand chains have been much deeper with wide collapses of the local and global supply and demand chains.

Facing new crises caused by Covid19, the traditional and well-known policy measures such as expansionary fiscal and monetary policies does not work unless Covid19 virus is

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[1] It is true that there is increasing debates about the exogeneity of Covid19 crisis since the health crisis was caused by unruly destruction of wild life habitat. However, considering the degree and the scale of unpredictability, Covid19 crisis is widely described as an exogenous shock in comparison to the earlier economic and financial shocks.

physically controlled by effective vaccination and other medical measures. As complementary measure to reduce the possible liquidity crisis, the traditional expansionary policies such as quantitative easing in addition to loosened macro-prudential policies have been implemented to smooth the shock, and prevent sudden and abrupt financial instability. However, as long as the Covid19 virus itself is not controlled, all traditional policy measures might have only a temporary soothing effect.

Additional feature of the Covid19 crisis is that the crisis cannot be resolved by a single country approach without the global coordination. In other words, a single country solution never works. Unless the global ending of Covid19 infection is reached, the crisis caused by Covid19 is not over at all. Therefore, the effective and efficient global coordination for vaccination and other health policy cooperation is the pre-requisite for the global ending of the Covid19 crisis.

In addition, the Covid19 crisis is characterized as an extremely asymmetric shock depending on the types of economies and industries. First, the impacts of Covid19 show big asymmetry depending on country-level differences in the available resources for emergency relief policies. For advanced economies with relatively abundant resources available for emergency relief policies and health measures including vaccination, the scale of the negative economic impacts after the Covid19 turned out to be much lower than the case of less developed economies as reported by IMF in Figure 1.

In case of global financial crisis after 2008, the negative economic damages in advanced economies were much more severe in the advanced economies than less developed economies since the scale of asset bubbles and the negative contagion effects of the collapse of asset bubbles in advanced economies were much larger. Contrarily, after Covid19 crisis, the negative shock in the less developed countries are much more severe mainly due to the insufficient relief measures to handle health crisis including vaccination and much lower social resilience with the malfunctioning social safety net systems. In addition, less developed economies are heavily dependent on 'high-contact' service sectors that are most heavily hit by the pandemic. Mainly due to the fact that the negative shocks after Covid19 crisis are concentrated to high-contact industries in less developed

economies, the global negative shock after Covid19 crisis is less severe (-2.7% growth in the world economy) than the case after the global financial crisis in 2008 (--8.6% growth in the world economy.)

< Figure 2-1>
Asymmetric Impacts of Covid19 Crisis in comparison to Global Financial Crisis
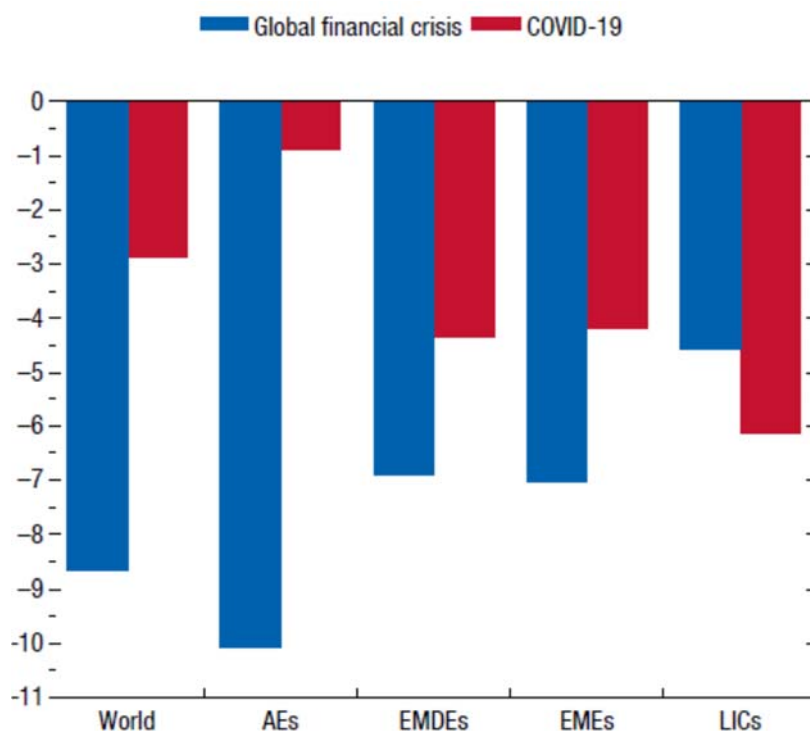
Source: IMF, WEO 2021

In addition, the asymmetric economic shock of Covid19 is expected to be increased dynamically between advanced economies (AEs) and least industrialized developing countries (LIDCs) due to limited resources and fragile economic instability in LIDCs that are most heavily hit by Covid19 shock as shown in the following figure.

< Figure 2-2>

Asymmetric Impacts of Covid19 Crisis on different income level countries
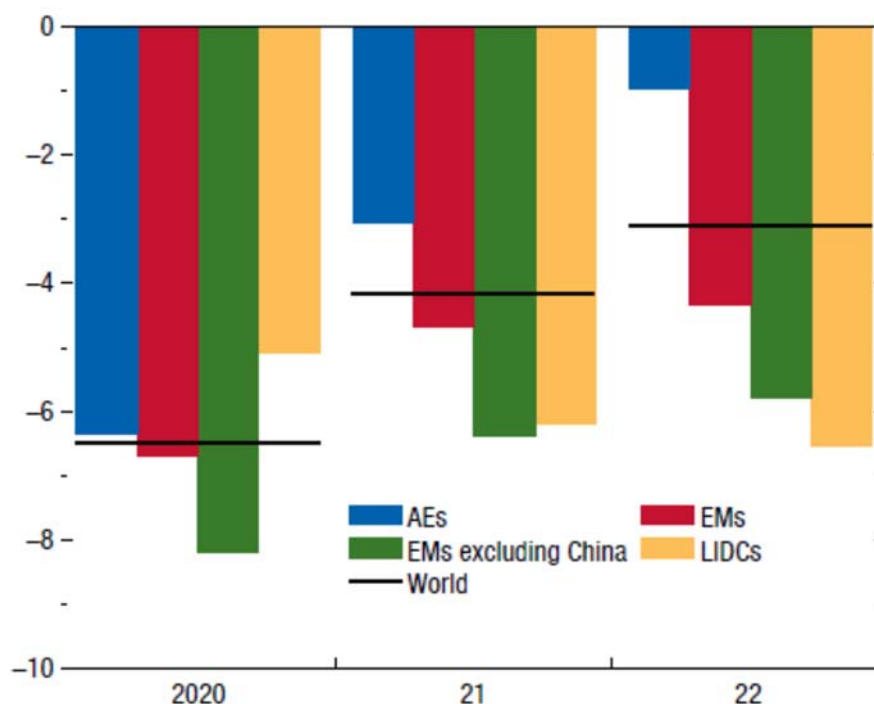
Source: IMF, WEO 2021

(3) 'High-contact industries,' the most heavily hit sector concentrated in less developed economies

Since the negative shock of Covid19 crisis took the form of the lockdown that physically disconnects the supply and demand chains of industries that are highly dependent on 'high physical contact interactions', 'high-contact industries' such as tourism, restaurant, transportation, retail sectors are most heavily affected with the supply and demand collapsed simultaneously. 'The high contact sectors' are most heavily affected by the Covid19 crisis, usually with very limited resources available to absorb the shocks. Therefore, without the active government relief measures, it is highly likely that these vulnerable sectors are under the threat of imminent exits from the market. Unless the early shocks in the most vulnerable 'high-contact' sectors are properly handled, non-performing loans and defaults starting from the sector might be the starting point of

possible financial instability.

On the contrary, the low-contact, technology intensive sectors, such as on-line digital service sectors and online platform based industries, came to increase market power with almost all sectors expanding online business models after Covid19 crisis. While high-contact sectors are usually characterized as low valued-added sectors, low-contact or un-contact sectors are featured as technology-intensive sectors with high network externalities. With the repeated lockdowns due to uncontrolled Covid19 virus, the market dominance by online businesses and platform-based industries led by Big tech firms came to expand to all sectors followed by increased market power concentration and income inequality.

The asymmetric impacts of Covid19 on high-contact industries and low-contract industries are well represented by the following diagram which shows that low contact industries represented by the on-line platform industries recovered in V-shape pattern after Covid19 shock, eventually reaching a better state in comparison to the case of the 2008 global financial crisis(GFC). On the other hand, the negative shock of Covid19 on high contact industries is serious enough that the high contact industries cannot recover to the pre-shock level, which is even lower than the level after the GFC shock as noted in the following diagram.

< Figure 2-3>

Asymmetric Impacts of Covid19 on high contact and low contact industries
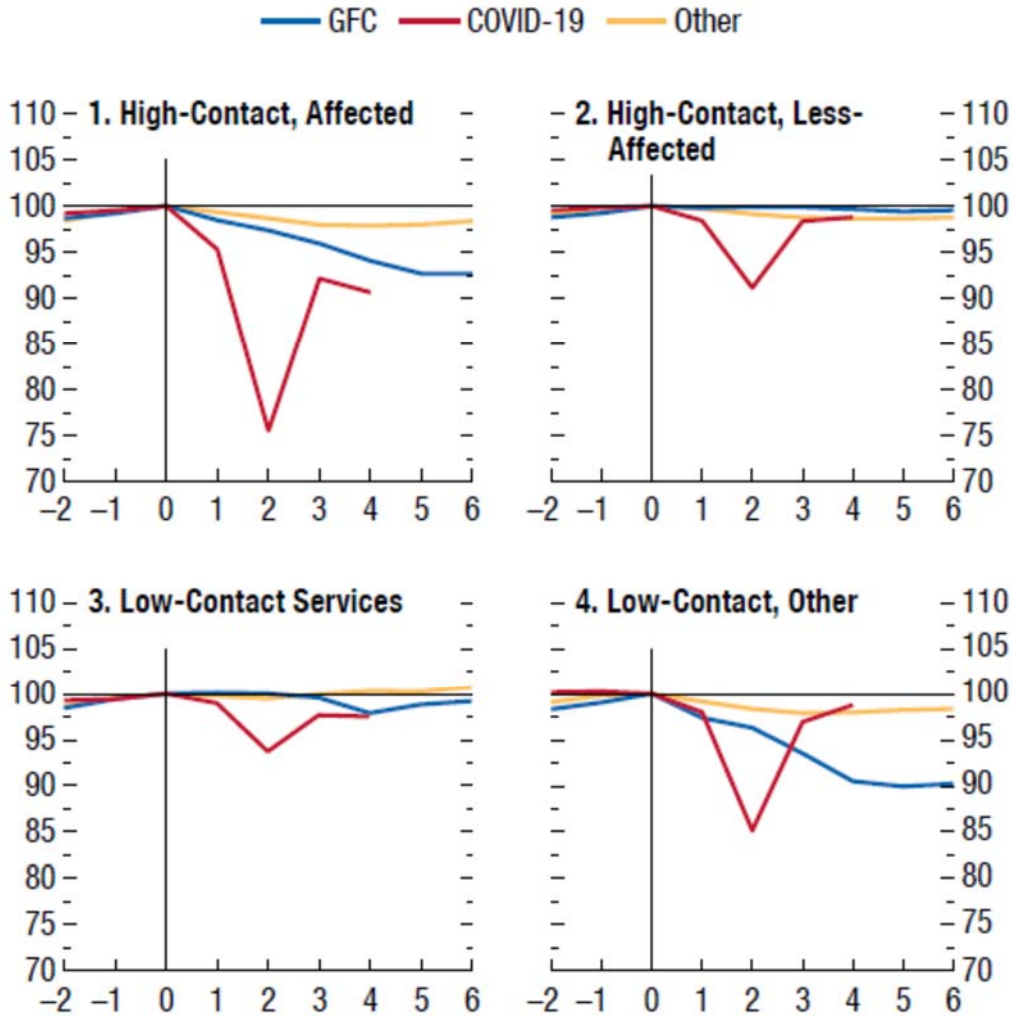
Source: IMF, WEO 2021

On the contrary, the low-contact, technology intensive sectors, such as on-line digital service sectors and online platform based industries, came to increase market power with almost all sectors expanding online business models after Covid19 crisis. While high-contact sectors are usually characterized as low valued-added sectors, low-contact or un-contact sectors.

Till now, the general trends of the financial market stability is strikingly stable mainly due to the active policy intervention by the central banks and government with the

coordinated actions to extend the loosened macro-prudential policies in addition to the massive expansionary monetary and fiscal policy tools. The real problem is that whether the extended health crisis will be accompanied by the financial instability with the initial illiquidity crisis aggravated to insolvency crisis, which is discussed in details in the next section.

B. What is waiting after Covid19 crisis?

(1) Asymmetric shocks and the deepened polarized economy and society

Since the 'high-contact, low-value added' sectors were most heavily hit after the Covid19 crisis, the impacts of the pandemics are supposed to be a very asymmetric shocks mainly damaging low value-added contact economy, while high value-added, low-contact or un-tact sectors have rapidly expanded in the scale of market dominance and profits level.

Driven by the asymmetric shocks, deepened unequal and polarized economy and societies are expected at the country level after Covid19 crisis as follows. First, V shaped economic recovery after Covid19 starting from 2021 is expected for advanced economies that provide full vaccination for domestic residents and strong social safety net, which enables private sectors' resilient response to Covid19 shock. On the other hand, the so-called L shaped shocks, which represents for continued economic downturn without recovery, are expected for less developed economies after Covid19 without proper resources for vaccination and functioning social safety net, eventually ending up with little resilience of private sectors to overcome Covid19 shocks.

Deepened unequal and polarized economy and society at the industry level after Covid19 crisis is confirmed with high value added, technology intensive, low-contact or un-tact economies and networked industries getting more concentrated market power, eventually leading to winner-takes all system. On the other hand, low value added, less-technology intensive, contact-based industries will be heavily damaged with the large

portion kicked out of the market via automation, digitalization, and extended networking.

Accumulated social stresses due to deepened polarized economies are highly likely to instigate social and political disturbances after Covid19 crisis. Countries that can address the deepened inequality and polarization via active policy measure for economic and social integration might survive the crisis politically. However, for countries that cannot handle the increased economic and political distress caused by the deepened inequality and polarization after covid19, the future political stability after Covid19 crisis will be exposed to the extreme vulnerability to any kinds of unexpected shocks.

(2) Pandemic with financial crisis & Pandemic without financial crisis

Although the onslaught of the Pandemic crisis was threatening in terms of the scale and the depth via the simultaneous physical disconnection of the supply and demand chains, the financial instability such as the collapse of the financial systems was minimized due to the very active and massive measures to counter the Covid19 shocks.

However, the real possible crises are expected to be from now on with the diverse financial stresses are accumulated throughout the economic systems not only in less developed economies but even in advanced economies. First, with the unprecedented amount of liquidity created via the emergency relief policy actions, the price level of most assets (stocks and real assets as housing) are unprecedentedly high in comparison to the laggard real economic performances. The immense asset bubbles are considered to be the latent bombs to be exploded if triggered by a sudden contractionary shock. It is deeply worried that if a less developed economy is trapped in the financial crisis after Covid19, the liquidity crisis will be aggravated to insolvency crisis with almost no exit from the crisis.

A solid social safety net system will be the source of the healthy system resilience to recover from the Covid19 crisis and mitigate the possible probability for the financial crisis. The problem is that most less developed countries are unprepared for working and effective social safety net system. The real question is how to policy tools to minimize

the social shocks that can be extended to L shape crisis accompanied with financial crisis without the effective and working social safety net system and the required resources.

C. Implications for Nepal?

Heavily dependent of 'high-contact industries' as tourism and remittances from worker abroad mainly in service sectors or high-contact industries, Nepal economy is one of the hardest hit economies by the Covid19 crisis. Considering the relatively successful example of transforming the industrial structure in a neighboring country, i.e., Sri Lanka, it is recommended that more organized policy efforts are made to find a path to drive Nepal economy to get out of the vicious circle of the tourism-centered economic structure.

Moreover, although it is imperative that Nepal authorities as NRB makes the best efforts to prevent the possible financial instability, it is more important to find dynamically optimal policy tools considering the current structural problems of the Nepal economy and the Nepal financial system. It is a global trend to get prepared for the policy actions for 'After Covid19 financial stability' mainly concerning over-inflated asset prices based on the massively increased liquidity due to various relief policy measures. Especially, with the increased concerns on the inflationary pressure in the US and other advanced economies, the contractionary monetary policies are discussed to be introduced sooner or later. In the same context, even among developing and less developed economies, the necessity to introduce more rigorous macro-prudential policies and even straightforward contractionary monetary policies.

Facing these international environments, it is required to identify the optimal macro-prudential policy and monetary policy considering the current stage of Nepal economies' recovery from Covid19 crisis and the current structural problem of Nepal financial system. In that context, the first question for the Nepal financial stability policies is that whether the current level of the asset bubbles is a serious source of the financial instability in Nepal. A related question is that whether the 'relief policies to handle health & humanitarian disaster' in Nepal have been enough and proper. If the humanitarian disasters caused by Covid19 are still ongoing dominant phenomena, the discussions on

the necessity to introduce strengthened macro-prudential policies in Nepal would be miserable cases of out of the context.

Financial stability implies a stable and well-functioning financial system efficiently channeling financial resources to more productive and high-value adding sectors, eventually contributing to vibrant and sustainable economic growth. In that context, financial stability in Nepal implies that the stable financial system serving the most important and imperative target of the Nepal economy, i.e., the vibrant economic growth and development. Therefore, the financial stability without proper economic and industrial development is meaningless, and therefore, financial stability policies should be integral parts of the Nepal developmental policies. Consequently, the efficient financial stability policies should be coordinated with the industrial developmental policies of Nepal. The most important rationale for financial stability in Nepal is to provide an optimal environment for economic and industrial development. In other words, 'providing further incentives for the increased investment in prospective business sectors' should be the predominant issues for financial stability discussions in Nepal.

2. The impacts of Covid19 on Nepal economy

The Covid-19 has been a sudden event to the world so to Nepal, as there was no such crisis forecast and strategies formulated to tackle with it. Its economic impact was throughout the world but the intensity was definitely different depending upon the macroeconomic dynamism, socioeconomic setting, health infrastructure, population characteristics, political decisions, economic revival packages implemented etc. Its direct impact was on public health but it had wider implication on the entire socioeconomic as well as political system. In order to revive the system the role of government was critical because the loss was massive and there was need to prevent the system from collapse. Interconnectedness between economies possesses many advantages and helps a lot to realize competitive advantages through the sharing of resources and output however at the same time it poses threats, too. During pandemic it was quite visible through the

distorted supply chains and production processes. In Nepal impact can be assessed in terms of problem in continuity of business, increasing poverty level, disruption in supply side and distribution system. Slowdown in economic growth, decline in foreign trade, inability to meet the government revenue targets, asset quality deterioration of the financial system are some broad issues of different sectors arising out of Covid-19 pandemic. How economy revives after the pandemic is the major issue- it can be V-shaped, U-shaped or L-shaped, however the concern is to bring back the economy in the regular track as early as possible.

In the pandemic period also some of the economic indicators showed optimistic picture. The workers remittance inflow followed the growth trend, foreign reserve was enough for import of goods and services for more than seven months, balance of payment surplus was recorded, broad money growth as well as private sector credit growth was satisfactory. Meanwhile, refinance facility and subsidized loan (Government of Nepal's program) increased significantly, liquidity position was at comfort zone, financial access and electronic payments have increased even during pandemic period.

Loss of output and employment due to contraction of economic activities is the major concern and to recover is the main economic challenge. Being a landlocked country and bordering between the largest economies- India and China, Nepal is having both challenge as well as opportunity. On the other hand, during pandemic free movement across the open border shared with India, accentuated the health screening problems. Furthermore, weaker and inadequate public health infrastructure and high dependency on other countries for vaccine against Covid-19not only put the lives of people at risk but also weakened the chances of early recovery of the economy, which is already dependent upon workers' remittance and large imports.

The economic growth of Nepal was affected in 2019/20 due to the restrictive measures undertaken by the government to contain the risk of spread of Covid-19. Inflation remained subdued and external sector remained resilient even during the pandemic supported by remittances, lower imports and external resource mobilization by the

government of Nepal.[2] Throughout this pandemic, the thing that has stood up has been the payments system and is believed to be the point of departure for a cashless banking habit. Conscious efforts were undertaken to promote the cashless banking habits and make payments digitally.[3]Conventional as well as unconventional policy measured were adopted to rescue the business and industries from pandemic whereas concessional policy rates, postponement of certain regulatory provisions, some favour in loan loss provisioning helped BFIs absorb the shock of pandemic to some extent.

A. Impact on Macroeconomic Variables

The growth of Nepalese economy was affected significantly in 2019/20 due to the restrictive measures taken to contain the risk of spread of Covid-19. Inflation remained subdued and external sector remained resilient even during the pandemic supported by remittances, lower imports and external resource mobilization by the government of Nepal.[4]

(1) Gross Domestic Product

Several policy efforts and relief packages have been announced and implemented to minimize the impact of Covid-19 in the world economy but still it is not sure how and till when it works. There is absolute uncertainty that when the pandemic will be under control, though vaccination has already started and its effectiveness is yet to be confirmed. However, it is estimated that the tourism, real estate and other personal service related sectors are last to join the revival cycle, as life returns to normalcy.

According to Central Bureau of Statistics (CBS) of Nepal, the gross domestic product

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[2] Financial Stability Report 2018/19, NRB
[3] Financial Stability Report 2018/19, NRB, Pp:80
[4] Financial Stability Report 2018/19, NRB, Pp3

(GDP) growth rate for fiscal year 2020/21 is estimated to stand at 4.0 percent, last year such growth rate declined by 2.09 percent.

As per broad economic group classification entire industrial sector has been divided into primary, secondary and tertiary sector. Compared to other sectors the share of tertiary sector is slightly increasing in the past recent years.

Primary sector broadly includes agriculture, forestry, fisheries and mining and quarrying. Share of this sector has been recorded as 26.4 percent for the current year and it is estimated to grow by 2.75 percent.

Secondary sector broadly includes manufacturing, electricity, gas and water supply; and construction. Share of this sector has been recorded as 12.5 percent for the current year and it is estimated to grow at 4.4 percent.

< Figure 2-4> GDP Growth Rate
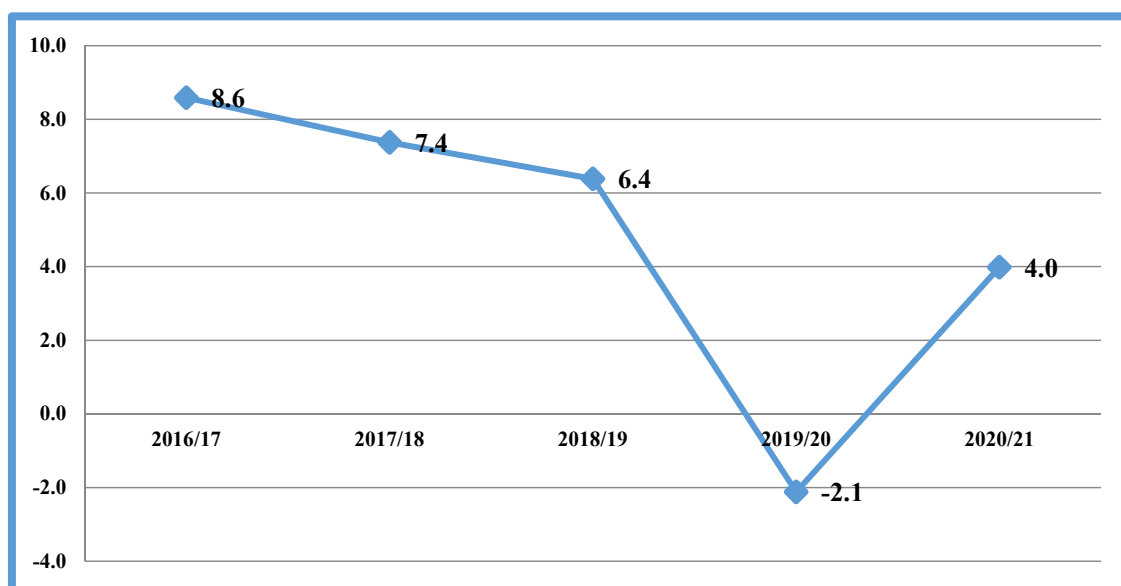
Source: Nepal Rastra Bank

Tertiary sector mostly includes wholesale and retail trade, accommodation and food services, transportation, communication and storage, financial intermediation, real estate, professional and administration, public services and securities, education health and other services. Contribution of this sector has been 61.1 percent and growth estimation was

4.43 percent. The accommodation and food services, transportation are the sectors that are relatively hard hit by the pandemic.

(a) Covid-19 and GDP

Fiscal year 2019/20 is the most affected year by pandemic where the GDP growth of -2.09 percent was recorded compared to 6.66 percent of pervious year. Along with the world economy the Nepalese economy was also badly affected by the Covid-19. In order to control the spread of Covid-19 the government of Nepal enforced *lockdown* in the country from March 24, 2020 to June 14, 2020 allowing the operations of urgent services only as a result of which most of the economic activities got affected. In order to capture the impact of pandemic in the economy NRB conducted a survey from June 8, 2020 to June 24, 2020 on Impact of Covid-19 in the Economy with the objective to assessing the impact of pandemic on different sectors of the economy as well as on employment. The survey identified that during the *lockdown*, 61 percent of the businesses/industries were completely shut down, 35 percent were operating in sub-par capacity and only 4 percent of the business/industries were operating at their full capacity. Majority of business/industries that were closed included the hotels, restaurant, education institutions, real estate, transportation and storage industries.22.5 percent of the business/industries had laid-off employees and more than one third of the laid-off employees were temporary, contractual and daily wage earners. Hotel and restaurants laid-off most of the employees. Salaries were cut-down by around 18.2 percent mainly by relatively bigger business/industries compared to other sectors. 96.7 percent of the industries reported that their production/operation reduced considerably. The major problem identified by the businesses/industries was the cost of continuing with their business, paying off salaries and wages, rent, and loan installments. Small and medium scale industries were identified to be hardest hit by the pandemic. The time that would take businesses/industries to return to normal operation was expected to be around 9 months. For hotels and restaurants industries, the turnaround time was expected to be around 13 months.

In fiscal year 2019/20, agriculture, forestry and fishing sector having weight of 25.83 percent in GDP, grew by 2.23 percent whereas previous year the growth was recorded as 5.16.

Decline in growth was mainly due to unavailability of fertilizer at the time of planting paddy, unable to access market by perishable agro products such as vegetable, milk and meat, closure of accommodation and food service activities, decline in demand due to stoppage of tourism business, disruption of regular supply chain due to *lockdown* were the main reason for decline in this sector. The growth of manufacturing sector having weight of 5.08 percent was -8.57 percent. Previous year its growth was recorded as 6.52 percent, as study identifies closure and under capacity utilization of the industries due to pandemic and *lockdown* thereafter was the major reason for negative growth. The electricity, gas, steam and air conditioning supply sector having mere weight of 1.23 percent achieved impressive growth of 25.58 percent mainly due to commencement of hydropower project. In the previous year growth of this sector was recorded as 9.61 percent. The growth of construction sector having weight of 5.68 percent was -4.99 percent in the review year, previous year such growth was 7.48 percent. The construction activities were interrupted during *lockdown* period as workers of mega projects who were foreigner (mainly Chinese) could not return back to work from leave and other regular construction works also affected due to pandemic.

After agriculture sector wholesale and retail trade; repair of motor vehicles and motorcycles sector is having largest share of 15.67 percent in GDP. This sector suffered with the growth of -10.69 percent whereas previous year this sector grew by 8.11 percent. The transportation and storage sector having weight of 5.43 percent is also hard hit sector whose growth stood at -13.37 percent, previous year such growth was 8.77 percent. This sector affected as *lockdown* restricted the public as well as private transportation and tourism activities. Accommodation and food service activities are the hardest hit sector of GDP though its share is only 1.56 percent. In the review period, growth of this sector stood at -36.97 percent, whereas previous year such growth was 9.92 percent. This sector is related to tourism and similar activities which is highly affected sector and still

suffering from the pandemic. The relief packages are also largely targeted to these sectors so that they could quickly recover.

NRB conducted two follow up surveys for the initial survey of Impact of Covid-19 in the Economy on November 2020 and April 2021 with same respondents and methodology. The follow up surveys identified that

- Compared to pre-Covid-19 month February 2020, only 4.1 percent of industries were operated with full capacity utilization in Covid-19 affected month June 2020 and in April 2021 81.2 percent of industries operated with full capacity. Whereas, still 4.2 percent of industries are not able to operate.

- In June 2020 only 28.8 percent of production/transaction were realised whereas in April 2021 such production/transaction were recorded as 61.4 percent. All the industrial sectors' production/transaction increased in the period whereas production of hotel and restaurant was lowest i.e. 40.8 percent.

- Compared to pre-Covid-19 period, 77.5 percent employment was achieved by different industries and it increased to 93.8 percent in April 2021, depicting a good start of recovery.

- Most of the industries/business respondents reported the problems of reduction in transaction due to sluggish demand, difficulty to get refinance and concessional loan, difficulty in getting additional loan etc.

- As per result of the survey, there was significant improvement in the operation of industries/businesses in April 2021 compared to the pandemic period even though it is not able to reach at the period of pre-Covid-19 period. The recent second wave of Covid-19 and enforcement of *lockdown* from April 29, 2021 has affected the economy that was in gradual improvement process. Effect of this second wave is yet to be assessed. (Annex1: GDP and its Composition)

The gross domestic saving as percentage of GDP has dropped significantly to 6.35 percent in fiscal year 2019/20 from 15.30 percent of previous year mainly due to decline in GDP and continued increment in consumption expenditure. The impact of pandemic on this variable is expected to continue in fiscal year 2020/21, as per preliminary

estimation it stood at 6.62 percent. Consequently, the gross national saving as percentage of GDP also declined to 32.61 percent for fiscal year 2019/20 compared to 42.12 percent of previous year. In the review period the resource gap as percentage of GDP has increased to 4.21 percent compared to 0.74 percent of previous year.

Meanwhile, the negative impacts of Covid19 on the Nepal economic growth were more serious than in the other developing economies with the similar per capita GDP level as Bangladesh, Myanmar, Laos, and East Timor mainly due to Nepal economy's higher dependence on tourism and remittance income during 2020 and 2021 as shown in the following diagram.

< Figure 2-5>
The GDP Growth after Covid19 in five LDC countries with similar per capita GDP
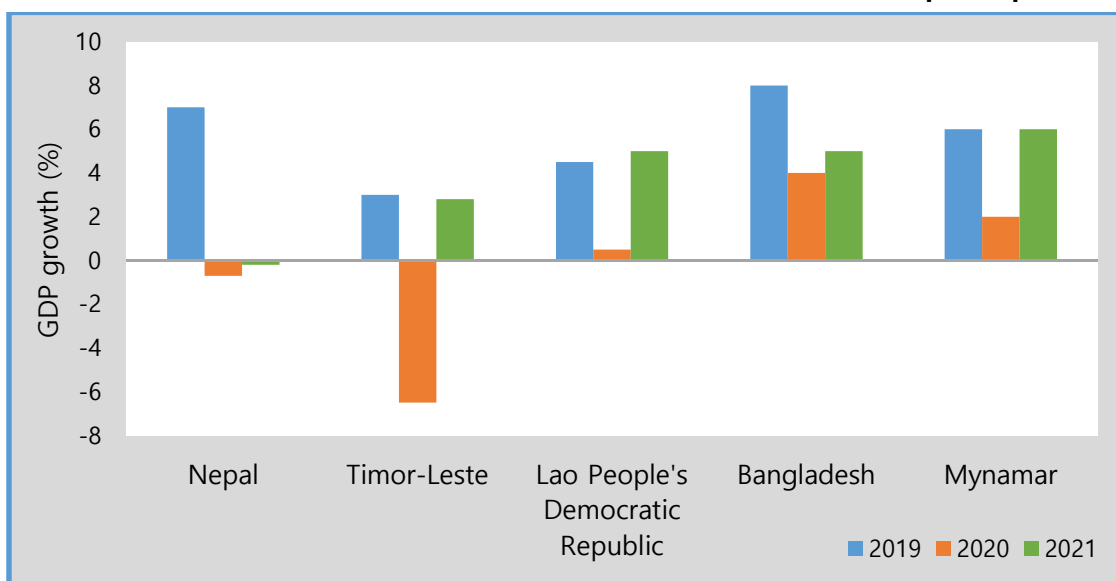
Source: UN DESA (2021)

(2) Inflation

The monetary policy 2019/20 adopted the monetary target to contain consumer price inflation within 6 percent. The average consumer price inflation stood at 6.15 percent in 2019/20 which is slightly higher than the target. The food and beverage inflation exerted

higher pressure on CPI compared to non-food and service inflation. Disruption in production due to *lockdown* affected the regular supply chain that put pressure in price. Previous year the consumer price inflation was recorded at 4.64 percent.

Nepalese economy is mainly based on imports, which accounts more than 36 percent of GDP. In 2019/20 the imports to GDP ratio has reduced to 30.6, implying relatively lesser supply of consumables. Reduction in imports is mainly due to restriction on movement and trading activities during pandemic. Decline in import of goods is one of the reasons of higher consumer price inflation i.e. 6.15 percent. In 2020/21 imports to GDP ratio increased to 36.1 percent and consequently consumer price inflation reduced to 3.60 percent.

< Figure 2-6> Consumer Price Inflation
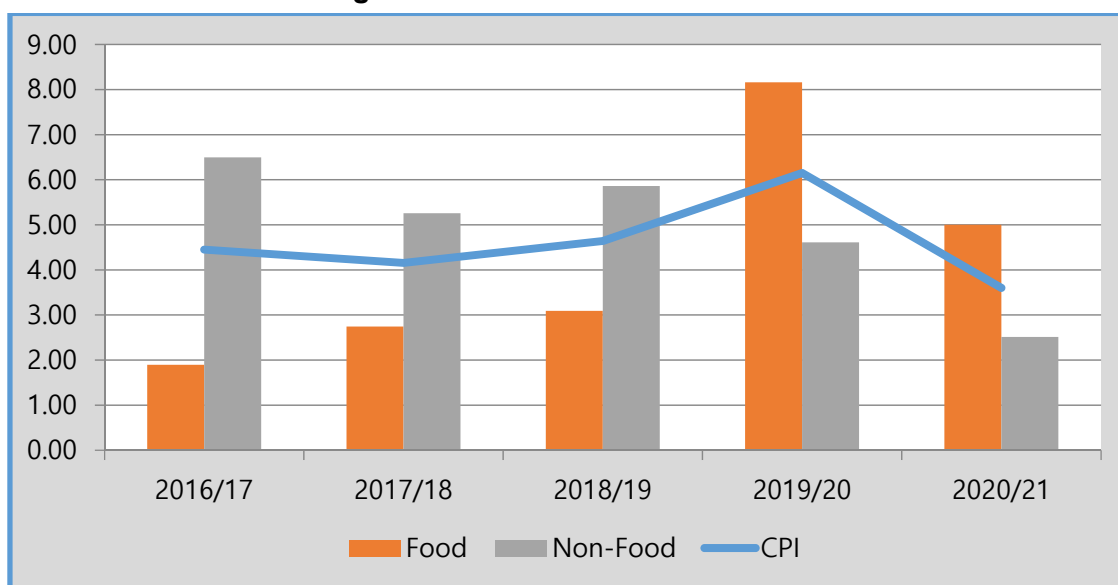
Source: NRB

The y-o-y consumer price inflation stood at 3.60 percent in fiscal year 2020/21. Food and beverage inflation stood at 5.00 percent whereas non-food and service inflation stood at 2.51 percent in the review month. As life gradually returned to normalcy after first wave of Covid-19 the supply system restored that helped to bring down the price level.

(3) External Sector

In 2019/20, merchandise exports increased 0.6 percent to NPR97.71 billion compared to an increase of 19.4 percent in 2018/19. Destination-wise, exports to India increased 11.8 percent whereas exports to China and the other countries decreased 43.5 percent and 18.2 percent respectively. Exports of palm oil, medicine (ayurvedic), herbs, plastic utensils, fruits, among others, increased whereas exports of zinc sheet, wire, polyester yarn and threads, readymade garment, woollen carpet, among others, decreased in the review year. The encouraging matter of fact to mention is that even in the period of pandemic the export has been increased. The export oriented business has been less affected from the restrictions imposed during this period. During 2020/21, merchandise exports increased 44.4 percent to NPR 141.12 billion.

< Figure 2-7> Foreign Trade (As per percentage of GDP)
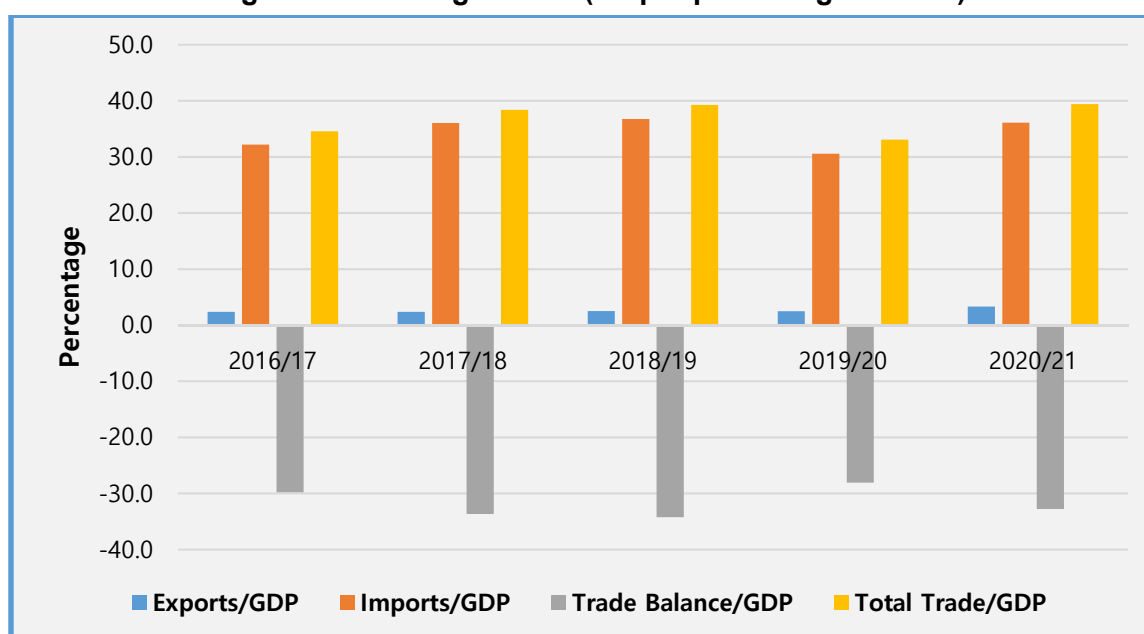
Source: NRB

In 2019/20, merchandise imports decreased 15.6 percent to NPR1196.8 billion against an increase of 13.9 percent in the previous year. Destination-wise, imports from India,

China and other countries decreased 19.9 percent, 11.5 percent and 5.3 percent respectively. Imports of crude palm oil, crude soybean oil, chemical fertilizer, edible oil, computer and parts, among others, increased whereas imports of petroleum products, transport equipment and parts, M.S. billet, gold, other machinery and parts, among others, decreased in the review year. As Nepal was facing high import growth since many years the recent decline in import would have been a positive sign if import of final goods and luxury goods have declined but decrease in import of industrial raw materials depicts the stoppages in production processes during pandemic period. During 2020/21, merchandise imports increased by 28.7 percent to NPR1539.8 billion.

Trade deficit narrowed down by 16.8 percent to NPR1099.09 billion in review year 2019/20. Such deficit had expanded by 13.5 percent in the previous year. Trade deficit stands 29.2 percent of GDP. The export-import ratio increased to 8.2 percent in the review year from 6.8 percent in the previous year. Decrease in imports and increase in exports helped to narrow down the trade deficit. This is also a remarkable phenomenon during the pandemic. Whereas, trade deficit increased by 27.3 percent to NPR 1398.7 billion in 2020/21. The export-import ratio increased to 9.2 percent in the review period. In 2020/21, both the export and import increased and as import base is higher than export base the trade deficit also increased.

Remittance inflows decreased 0.5 percent to NPR875.03 billion in the review year 2019/20 against an increase of 16.5 percent in the previous year. In US Dollar terms, such inflows decreased 3.3 percent in the review year against an increase of 7.8 percent in the previous year. Number of Nepali workers taking approval for foreign employment decreased 20.5 percent in the review year. It had decreased 32.6 percent in the previous year. The number of Nepali workers (Renew entry) taking approval for foreign employment decreased 34.7 percent in the review year. It had increased 5.4 percent in the previous year. Remittance inflows increased by 9.8 percent to NPR 961.05 billion in the 2020/21. In USD terms, remittance inflows increased by 8.2 percent to USD8.15billion in the review period against a decrease of 3.3 percent in the same period of the previous year. The remittance to GDP ratio is more than 22 percent in Nepal, so it has remarkable

contribution in the Nepalese economy. There was prediction that due to Covid-19 the migrant workers will lose their job in the foreign countries and there would be severe decline in remittance income of the country. Against the prediction no significant negative impact was observed as effect of pandemic was lower in the Gulf countries, where large numbers of migrant Nepalese workers are working. Another possible reason can be remittances sent through as informal channels must have disrupted during restricted periods of pandemic. Similarly, remittance inflow also used to occur in kind instead of currency itself but due to travel restrictions *lockdown* such remittance also transferred in the form of currency.
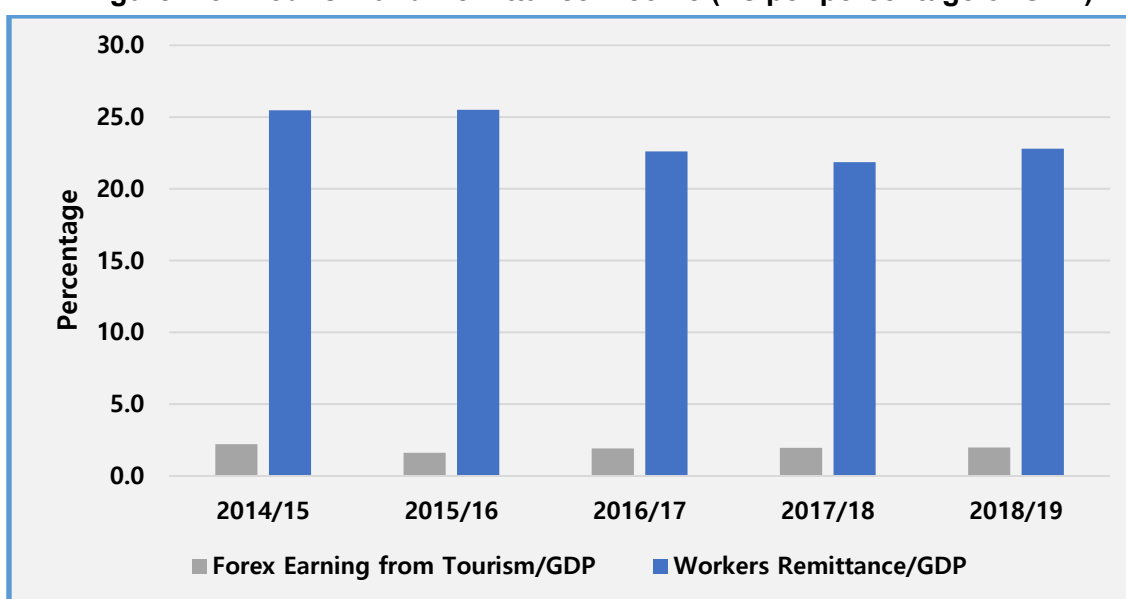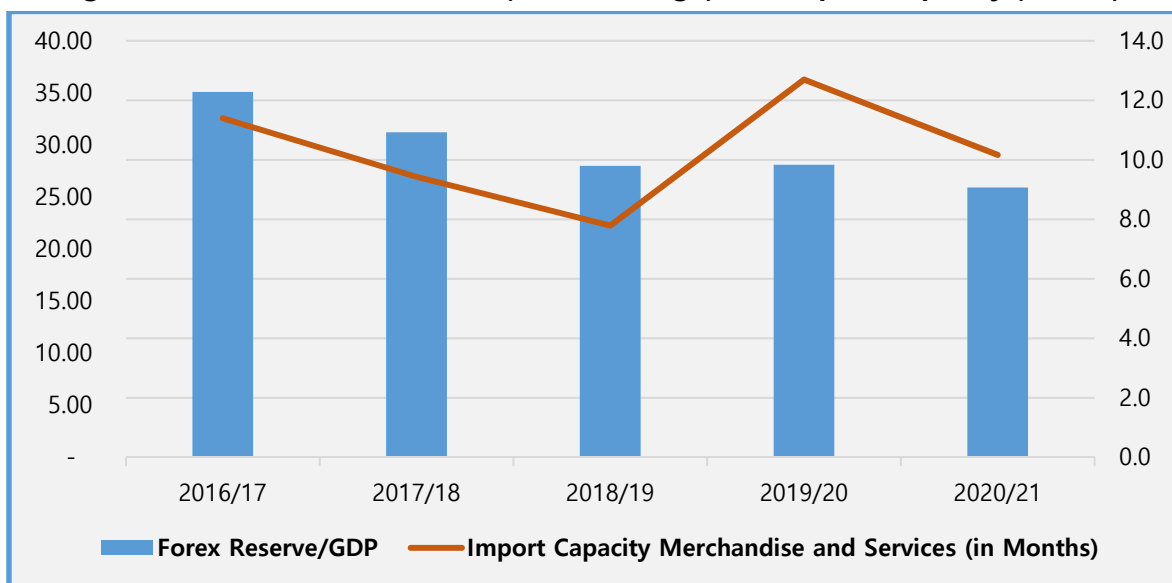
<Table 2-1> Tourism and Remittance Income (As per percentage of GDP)

Fiscal Year	Forex Earning from Tourism/GDP	Workers Remittance/GDP
2014/15	2.2	25.5
2015/16	1.6	25.5
2016/17	1.9	22.6
2017/18	1.9	21.8
2018/19	2.0	22.8

< Figure 2-8> Tourism and Remittance Income (As per percentage of GDP)

Source: NRB

Balance of Payments (BOP) remained at a surplus of NPR282.41 billion in 2019/20 against a deficit of NPR67.4 billion in the previous year. In US Dollar terms, BOP recorded a surplus of USD 2.35 billion in the review year against a deficit of 591 million in the previous year. In 2020/21, the BOP registered a surplus of NPR1.2 billion.

Gross foreign exchange reserves increased 34.9 percent to NPR 1,401.84 billion in mid-July 2020 from NPR 1,038.92 billion in mid-July 2019. In US Dollar terms, the gross foreign exchange reserves increased to 11.65 billion in mid-July 2020 from 9.50 billion in mid-July 2019. The reserves decreased by 0.2 percent to NPR1399.0 billion in mid-July 2021 from NPR1401.84 billion in mid-July 2020. In the USD terms, it has increased 0.9 percent to USD 11.75 billion in mid-July 2021 from 11.65 billion in mid-July 2020.

< Figure 2-9> Forex Reserve/GDP (In Percentage) and Import Capacity (Month)

Source: NRB

Based on the imports during 2020/21, the foreign exchange reserve of the banking sector is sufficient to cover the prospective merchandise imports of 11.2 months, and merchandise and services imports of 10.2 months. The ratio of reserves-to-GDP, reserves-to-imports and reserves-to-M2 stood at 32.8 percent, 90.9 percent and 27.1 percent respectively in mid-July 2021. Such ratios were 35.8 percent, 105.7 percent and 33.1

percent respectively in mid-July 2020.In nutshell, insignificant adverse impact on external sector was observed due to Covid-19.

(4) Employment

According to Report on Nepal Labour Force Survey 2017/18 published by central bureau of statistics of Nepal there were approximately 20.7 million people of the working age and approximately 7.1 million were employed while 908 thousand were unemployed. This translated into unemployment rate of 11.4 percent. Females reported a higher unemployment rate of 13.1 percent[5]. As per survey report published on July 2020 by NRB on Impact of Covid-19 in the economy, during *lockdown* period 22.5 percent of employees/labourers have been laid off by the industries/business involved in the survey. Among the laid off more than two third (70.6 percent) are temporary/contract labourers. The hotel and restaurant sector laid off the highest number of employees that is 40 percent of the employees/labourers among them 58.2 percent were temporary employees. The education sector laid off the least number (5.6 percent) of employees/laborers among other sectors. As per size of industry/business, cottage industry and SMEs & retail business laid off maximum employees/laborers which is more than the national average. In all the sectors maximum number of temporary/contract workers lost the job. During *lockdown* period on an average 18.2 percent salary cut have been done by the industries/business, the larger industries cut more salaries compared to the smaller. As per industrial classification, the hotel and restaurant business have cut more allowances and other facilities of their employees than other industry or business.

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[5] CBS

(a) National Economic Census 2018

According to National Economic Census 2018 conducted by CBS of Nepal[6] there were 923,356 establishments in Nepal where 3,408,746 persons were engaged in those establishments out of it 2,044,989 were male and 1,363,757 were female. The number of persons engaged per establishment stood at 3.70.

Among the entire establishments in Nepal (923,356 establishments), ''Wholesale and retail trade; repair of motor vehicles and motorcycles'' is the largest industry in terms of number i.e. 498,069 establishments, and it accounts for 53.9 percent of the total establishments. The second largest industry is ''Accommodation and food service activities''. There are 130,540 establishments, and it accounts for 14.1 percent of the total establishments. The third largest industry is ''Manufacturing'' industry. There are 104,058 establishments, and it accounts for 11.3 percent of the total establishments.

In terms of number of person engaged, 'Wholesale and retail trade; repair of motor vehicles and motorcycles' is the largest industry with 988,346 persons, and it accounts for 30.6 percent of the total employment in entire establishments. The second largest industry is 'Education' where 513,336 persons are engaged, and it accounts for 15.9 percent of the whole establishments. The third largest industry is 'Manufacturing' where 510,523 persons are engaged, and it accounts for 15.8 percent of the whole establishments.

Migration in cities, especially Kathmandu valley, from villages for search of job is common in Nepal with expectation of handsome earnings and for better facilities to their families but when there is crisis in their earning then they are likely to leave the city for back to their villages. Some observations showed that this type of migration to the village encouraged to starting up new venture or join their existing indigenous family business or profession and develop entrepreneurship for self-employment.

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[6] NEC 2018, CBS

B. Impact on Socioeconomic Variables

(1) Population

The Population Monograph of Nepal 2014 shows that 60.43 percent of population were engaged as agriculture, forestry and fishery workers, followed by 9.94 percent in elementary occupation and 8.29 percent in service & sale workers followed by other occupation based on population census of 2011. The population from the census is reported as 26.5 million with sex ratio of 94. The mortality rate is declining with crude death rate (CDR), which shows the number of deaths per thousand population, is estimated to be around 7.3 per thousand population against 10.3 in 2001 and life expectancy at birth for the census year 2011 is estimated at 66.6 years in 2011 against 49.6 years in 1981.

According to National Population and Housing Census 2011 (Population Projection 2011-2031)[7] based on medium variant the total population of Nepal in 2021 is 30.38 million with sex ratio of 94.16. Out of total population, people living with the age group of 15-49 years are 55.06 percent and this age group is generally economically active. The impact of Covid-19 is expected to have high and relatively long term on this group because this might have left them economically inactive and idle during the pandemic period creating frustration and decreasing their potential productivity.

(2) Education

The academic session 2019/20 was hard hit by the Covid-19 pandemic. During the period entire education and training institutes remained close. Regular academic session of around 8.7 million students of schools and universities were affected. Examination process, evaluation and results of different grades did not complete on the scheduled time. The programs of next academic session are also not being able to start due to second wave

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[7] CBS

of the pandemic. However, use of virtual platform to facilitate alternative learning technique, online classes and other alternative method of class and examination were practiced during the period. In order to address situation of Covid-19 and other similar pandemic the government has included alternative learning provisions in education bylaw in its amendments. All the school level exams of the academic session were conducted by the school through virtual platform. The secondary education examination (SEE) is supposed to conduct by national examination board but as per schedule of the board the exam could not be conducted due to pandemic that is why with the consent of the board the schools carried out examination internally. The education sector has been categorized as medium impacted sector in Nepal in order to provide relief packages for its revival.[8]

(3) Income (per capita income) –PPP – purchasing power parity

Per capita income is one of the important indicators of economic prosperity. In fiscal year 2019/20 the nominal per capita GDP of Nepal stood at US$ 1,126 previous year such income was US$ 1,171, whereas in fiscal year 2020/21 it is expected to stand at US$ 1,196. Decline in per capita income was also witnessed in nominal per capita GNI and nominal per capita GNDI. All these negative result is due to impact of pandemic in GDP.

(4) Health Infrastructures

Up to May 2021 the number of people infected from Covid-19 reached 439,658 out of them 327,653 recovered and 4,669 persons lost their lives. Compared to first wave the number of people losing their lives from second wave is increasing.

The contribution of health and social sector in gross value addition is estimated as 1.73 percent and in growth in GVA is estimated to increase by 6.53 percent. By February 2021 for test, treatment and management of Covid-19 pandemic 54 hospitals, 125 clinics, 84 laboratories for Covid-19 came into operation. Similarly, including all provinces 22,127

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[8] Economic Survey 2020/21, MoF

quarantine beds, 13,772 isolation beds, 1,154 ICUs bed, 475 ventilators and 676 HDUs have been built. Government of Nepal started the insurance policy for Covid-19 in Nepal. The health insurance program has been extended to 673 local level out of 753 local level, in which 37,19,962 members of 7,42,192 family have been insured. As of April 2021 60,587Covid-19 insurance claims have been approved amounting NPR 5.85 billion.

(5) Shift in Working Models

Working from home, flexible working hours, virtual meetings are the new paradigm observed in the pandemic. There was maximum use of information technology to get work done. The alternative way of doing works have become important in the pandemic that has increased efficiency keeping safety measures. Learning to do work without physical presence, work take away, remote access are the achievements during the period. Population having access to internet has increased to 82.8 percent this year (based on 8 months data) compared to 73 percent of last year. This has also increased the demand and use of information technology related devices such as smart phones and computers.

C. Impact on Financial Sector

The financial sector of Nepal mainly includes banking sector along with insurance, capital market, citizen investment trust (CIT), employee provident fund (EPF), cooperatives etc. As a central bank NRB issues license and regulates different banks and financial institutions such as commercial banks, development banks, finance companies, micro finance institutions and Nepal infrastructure development bank. Based on assets and liabilities of different players of financial sector, the banking sector licensed by NRB holds around 80 percent share of the entire financial sector. Remaining 20 percent constitute by other entities of financial sectors that are having their own regulating agencies or they are operating under special legal ground or acts.

(1) Deposit and Credit Growth of BFIs

The lockdown was imposed from ninth month of the fiscal year 2019/20and its impact on the banking system was visible in deposit collection as well as loan disbursement of the BFIs, even though the affected period was only four months of the year. In the review year, the total deposit collection was increased by 18. 7 percent compared to 18.0 percent of previous year. Whereas credit to private s ector was increased by mere 12.0 percent compared to 19.4 percent of the previ ous year. The monetary policy has set target of achieving 21.0 percent private se ctor credit growth in 2020/21. In the period, deposit growth of 21.4 percent and private sector credit growth of 27.3 percent was recorded. The decline in rate of growth in 2019/20 can be mainly attributed to the slowdown in the overall econ omy due to the Covid-19 and deterioration in investment climate[9]. Whereas incre ase in deposit and credit both in 2020/21is observed mainly due to revival of ec onomic activities after pandemic.

< Figure 2-10> Deposit and Credit Growth (In Percentage)

Source: NRB

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[9] Financial stability report 18/19, July 2020, Pp25

(2) Non-Performing Loan (NPL) and Loan Loss Provision (LLP)

The spread of Covid-19 in the country and imposition of *lockdown* to control the spread affected   the cash flows of business and industries as a result some businesses were unable to meet their obligation to repay their loan installment. Consequently, the NPL and LLP both increased in fiscal year 2019/20 compared to previous fiscal year. In order to provide some relief to the businesses and to help them to stay in the business so that they will be in a position to pay back the loan installment in future, NRB directed BFIs to allow deferral, discount on interest payments and restructuring and rescheduling. The NPL to total loan ratio increased to 1.89 percent in mid-July 2020 from 1.52 of the previous year. At the same time, LLP to total loan ratio increased to 3.58 percent from 2.17 percent in previous year. Similarly, in mid-July 2021 NPL to total loan ratio recorded as 1.48 whereas total LLP to total loan as 2.48 percent. Being LLP higher than NPL signifies that provisioning of the banking system is sufficient to cover the outstanding NPL. However, increase in the provision implies the growing risk evaluation in the financial sector, particularly in the context of Covid-19.

(3) Profitability

Decline in credit growth, problem in loan recovery, regulatory relaxation directed by NRB to support businesses exerted pressure on income of the BFIs consequently profitability of the banking sector declined. The overall profitability contracted by 20.62 percent in the review period, previous year the growth rate of profitability was recorded as 21.02 percent.

(4) Interest rate on deposit and lending, base rate, interest rate spread

Low credit demand from the business and industry due to deteriorated investment climate due to pandemic situation pushed the interest rates downward. The weighted average deposit rate and lending rate of commercial banks stood at 6.01 percent and 10.11

percent in mid-July 2020. Such rates were 6.60 percent and 12.13 percent respectively a year ago. The average base rate of commercial banks decreased to 8.50 percent in mid-July 2020 from 9.57 percent a year ago. Base rate system has been introduced by NRB in order to ensure transparency in interest rate determination, customer protection, promote sustainable and healthy competition. Whereas, interest rate spread is the regulatory band of difference bet-ween weighted average interest rate on deposit and weighted average interest rate on lending. The spread reflects all the costs associated with financial intermediation. NRB has regulated "A" class banks to limit interest rate spread to 4.4 percent and "B" and "C" class financial institution to 5.0 percent. As of mid-July 2020, the overall interest rate spread of "A" class banks stood at 4.10 percent.

This provision has restricted the maximum profit seeking behavior of the BFIs and increased customer trust on the BFIs.

(5) Banking and Financial services – increased use of online transaction

Electronic payment transactions have increased significantly due to development of payment infrastructure, policy of encouraging electronic payments and gradual adoption of electronic payment instruments amid Covid-19. BFIs started to provide various services such as account opening, KYC update, activating dormant account etc. through virtual medium. At the same time, the private sector credit expansion has been declined, asset quality of BFIs has been deteriorated, Covid-19 related relaxation affected revenue of BFIs to some extent. The remarkable achievement during pandemic was the increased awareness and banking transactions through virtual medium that has helped to enhance public confidence in electronic payment and settlement.

(6) Measures taken by NRB to address impact of Coivd-19 in the economy

Being central bank of Nepal, NRB has responsibility to rescue banking sector from the impact of pandemic by issuing some regulatory provisions. As the sector is tightly associated with real sector such as businesses and industries there was need to provide

some relief so that they could revive and continue their business in near future. The measures taken by NRB during pandemic are listed here.

(a) Liquidity related Measures

  i.   Reduction in cash reserve ratio (CRR) by 100 basis points (4 percent to 3 percent)
  ii. Reduction in bank rate by 100 basis points (6 percent to 5 percent)
  iii. Increase in CCD Ratio from existing 80 percent to 85 percent

(b) Relaxation on asset classification and provisioning for downgraded loans

(c) Macro prudential Measures

  i.   Suspension of maintaining countercyclical buffer for 2077/78
  ii. Increase of LTV for personal residential home loan
  iii. Relaxation on debt to equity ratio, single obligor limit

(d) Restriction on dividend distribution

(e) Implementation of business continuity loan as per guideline issued by Government of Nepal (GoN)

(f) Priority Sector Lending

  i.   Lending to hospital with Covid-19 treatment as priority sector
  ii. Time extension for lending in agriculture sector

(g) Relaxation on reporting time

(h) Donation on GoN Covid-19 fund allowed to include in CSR

(i) Unrestricted Operation and Business continuity

  i.   Issued notice to use ATM and maintain cash demand at ATM
  ii. Ensuring operation with minimum staff and work from home provision
  iii. Opening least number of bank branches

(j) Payment System

    i.   Not to charge fee on ATM use of any banks

    ii.   Facilitate the online transaction with priority

(k) Adoption of safety measures as per WHO standard and ensuring business continuity

    i.   Social distancing

    ii.   Use of Mask

    iii.   Use of sanitizer

    iv.   Adequate disinfection

III. Covid19's short term and long term impacts on financial stability and policy prescription

1. Covid19's short term impacts on financial stability in Nepal

The world economy was severely affected by the Covid-19 in 2020/21 and Nepal remained no exception. The restrictive measures taken by the governments across the world to contain the spread of the corona virus disrupted the supply chain and resulted in depressed economic activities. The surveys done by the NRB shows that 61 percent businesses remained closed in Nepal during the lockdown, 35 percent were in partial operation whereas 4 percent only were in full operation. Such a disruption in business activities resulted in a downslide in the demand for banking services and increased the risk of deterioration of banking assets. These developments have created challenges in maintaining financial instability.

A. Bank Capital and Capital Adequacy

Covid crisis moderated the growth of capital of the BFIs in Nepal. In mid–July 2020, the capital fund of BFIs increased by 9.38 percent to NPR 488.27 billion from NPR 446.40 billion in mid–July 2019. Such capital had grown by 20.64 percent in the previous year. The capital fund is composed of paid-up capital (NPR 330.87 billion), statutory reserves (NPR   94.14 billion), retained earnings (NPR 4.31 billion) and other reserves (NPR 58.93 billion).

On a quarterly basis, the growth of capital for all classes of BFIs slowed down during the Covid19 crisis. In the second and third quarter of 2019/20, the capital of the BFIs declined by 4.62 and 1.69 percent respectively and in the last quarter of 2019/20, growth of capital stood at less than 2 percent (Figure 3-1).

<Figure 3-1> Quarterly Growth of Capital of the BFIs

The capital adequacy ratio of the BFIs in 2020 remained above the regulatory minimum, despite the decline in the demand for credit and reduced income/profitability of the BFIs. This was partly due to the flexibility provided by the NRB in the treatment of asset classification and provisioning. The overall CAR of BFIs in mid-July 2020 stood at 14.16 percent, slightly lower than 14.29 percent in the previous year. The CAR ratio has fallen to 13.64 percent in mid-May 2021 (Figure 3-2).

<Figure 3-2> Capital Adequacy Ratios of BFIs (% of RWA)

The CAR of development banks and finance companies in mid-May stood at 13.17 percent and 21.09 percent respectively. During this period, the consolidation process of the BFIs through merger and acquisition has also helped strengthen the capital base.

The capital adequacy ratio of all the banks stood above the minimum CAR required by the NRB during 2016-2020. It was only during 2011-2014 that two state-owned banks of Nepal faced a short fall of the CAR.

B. Asset Quality

Nepal's NPL has been consistently low during the past few years. During the 1990's, the NPL ratio was over 20 percent that continuously fell to below 10 percent in the second half of 2000s. It was largely driven by the Financial Sector Reform Program implemented in the decade.

The disruption in the economic activities brought by the Covid19 pandemic severely affected the business of Nepal. As a consequence most of the business remained closed during March 2020 to July 2020 resulting into a shortage of cash flow and increasing probability to default. It has created challenges in managing the quality of bank assets. However, NRB and government of Nepal brought forward a list of measures to save the businesses during the pandemic and to support their resumption. The major relief measures provided by the NRB includes interest discounts, loan payment deferrals, refinance facilities, concessional lending program, provision for additional working capital and term loan facilities, increase in moratorium, loan rescheduling and restructuring facilities. On the other hand, the relaxations provided to the BFIs include relaxations in loan classification and provisioning. Such measures were crucial in maintaining the overall assets quality of the banking system.

The NPL of BFIs increased from NPR 44.18 billion in mid-July 2019 to NPR 61.59 billion in mid-July 2020.The NPL ratio of the BFIs stood at 1.5 percent in mid-April 2021 compared1.84 percent in mid-July 2020. During the period, NPL ratio for commercial

banks declined from 1.81 percent to 1.41 percent and that of development bank and finance companies declined from 1.52 percent and 6.18 percent to 1.50 and 5.71 percent respectively.   The NPL ratio of the 'C' class financial institutions is relatively higher due to the fact that a number of such institutions have been declared to be problematic.

<Figure 3-3> Non-performing Loan of the BFIs (% of Total Loan)

Source: Nepal Rastra Bank

In terms of ratio of NPL to total loans, the Nepali banking sector exhibited an improvement in assets quality and has sufficient provisions during the period of 2016-2020 indicating the banking sector's resilience toward inherent risks.

<Figure 3-4> NPL Ratio (% of Total Loans and Advances)

Source: Nepal Rastra Bank

Even during the Covid19 pandemic, none of the commercial banks have NPL above 5 percent as of mid-July 2020 and loan loss provision (LLP) of banking system amounting NPR 91.16 billion is sufficient to cover the outstanding NPL. The ratio of restructured/rescheduled loans to total NPL remained around 1.48 percent in 2019/20.

C. Profitability, Return on Equity and Return on Assets

Covid19 crisis reduced interest income of the BFIs and thus affected the profitability and return on equity as well as return on assets. During 2017 to 2019, the profit of the BFIs increased by 16.6 percent on average. However, in 2019/20, such profit declined by 20.6 percent. And during the first eleven months of 2020/21, profit of the BFIs has declined by 2.3 percent.

<Figure 3-5> Profit Growth of the BFIs

Source: Nepal Rastra Bank

Profit of the development banks and finance companies was more affected by the crisis than the commercial banks. In 2019/20, while profit of the commercial banks declined by 16.7 percent, profits of the development banks and finance companies declined by 47.6 and 56.1 percent respectively.

The decline in profitability of the banking system can be attributed to a number of factors. First, due to the restrictions placed by the Covid-19, demand for banking services declined and resulted into lower income. Secondly, the interest discounts provision as a relief measure reduced the income of the BFIs. And thirdly, mergers of development banks as well as finance companies with commercial banks led to a greater decline in profit of the development banks and finance companies compared to commercial banks.

Reduced profitability of the BFIs during the pandemic period can also be seen in the decline in ROE and ROA. The ROA of commercial bank declined from 1.8 in July 2019 to 1.2 in July 2020. Likewise, the ROA of development banks and finance companies declined from 1.5 and 1.6 percent in July 2019 to 0.9 and 0.6 percent in July 2020.

<Figure 3-6> Return on Assets

Source: Nepal Rastra Bank

The return on equity also declined for all classes of BFIs during the pandemic. The ROE of commercial banks declined from 16.9 percent in July 2019 to 12.5 percent in July 2020. Likewise, the ROE of the development banks and finance companies declined from 15.1 and 13.3 percent in July 2019 declined to 9.7 and 5.1 percent respectively in July 2020.

<Figure 3-7> Return on Equity

Source: Nepal Rastra Bank

D. Deposit Credit Growth

While deposit growth of the BFIs was not affected much during the pandemic, demand for credit was affected. In 2019/20, while the deposit mobilization of the BFIs increased by 18.7 percent compared to 18.0 in 2018/19, growth of credit disbursed to the private sector was limited to 12.6 percent compared to a growth of 19.4 percent in the previous fiscal year. During April 2020 to July 2020, when the government had implemented strict lockdown measures, the average y-o-y growth of private sector credit extended by the BFIs was 13.9 percent.

<Figure 3-8> Deposit and Credit Growth (y-o-y %)

Source: Nepal Rastra Bank

In terms of volume, the credit from the BFIs declined during May, June and August of 2020 by an average of NPR 14 billion per month. However, even during these distressed months, deposit mobilization of the BFIs increased by NPR 47 billion per month on average. After the lock down was partially lifted in July 2020, credit flows started to increase. Nonetheless, with the start of the second phase of restrictions in late April 2021, the rate of increase in deposits as well as credit has slowed.

<Figure 3-9> Monthly Changes in Deposit and Credit

Source: Nepal Rastra Bank

E. Liquidity of the BFIs and Banking System

The financial system had adequate liquidity during the Covid crisis. As such, deposit and lending rates gradually declined. NRB succeeded in prudently managing liquidity through the open market operations. During April 2020 to October 2020, the banking system had an excess daily liquidity of NPR 121 billion on average and the short term interest rate (interbank rate) was less than 1 percent.

The loose stance taken by the NRB contributed in maintaining the market liquidity at an appropriate level. NRB did not absorb liquidity from the market for a long time to easy the market situation and lower the cost of credit to the businesses. In addition, reduction

in the cash reserve requirements and increase in the refinance facilities helped increase liquidity in the system.

<Figure 3-10> Excess Liquidity in the Banking System (in billion Rs.)

Source: Nepal Rastra Bank

<Figure 3-11> Average Deposit and Lending Rate

Source: Nepal Rastra Bank

The interest rate did not experience any volatility during the Covid crisis. Rather it

followed a gradual downward trend following the loose stance of monetary policy. Such a movement helped in making interest rate more predictable and increased consumer and business confidence.

F. Policy Measures taken since 2020 by the NRB

Nepal Rastra Bank came up with a list of measure to ease market liquidity, promote credit from the BFIs and safeguard financial stability.

(1) Easing Liquidity Constraints

- Cash reserve ratio was reduced from 4 percent to 3 percent.
- Bank rate was reduced from 6 percent to 5 percent.
- Repo rate under the interest rate corridor was lowered.
- The credit to capital and deposit (CCD) ratio was raised from 80 percent to 85 percent.
- BFIs were allowed to disburse additional term loans and working capital loans to businesses. Under this provision, the businesses obtained additional 20 percent of the working capital loans and additional 10 percent of the term loans to meet their operational expenses

(2) Supporting the Financial Health of Customers and Business

- In order to ease the cash flow difficulty faced by the businesses, the payments to be made to the BFIs were deferred by 6 months to 2 years depending on the severity of the impact from the Covid crisis.
- Provision of interest discounts was brought whereby the BFIs provided 10 percent interest discount for timely payment in April 2020 and a2 percentage points interest discounts for businesses in the last quarter of 2019/20.
- Provision of refinance facilities, concessional lending and business continuity

lending were brought to provide resources to the affected businesses at lower cost.

- Provision of loan restructuring and rescheduling, and interest capitalization facilities were made available for the hard hit sectors of the economy.
- Auction related processes were deferred for the problematic borrowers.
- BFIs were directed not to charge any fees and penalties for late payments.

(3) Safeguarding Financial Stability

- The BFIs were provided relaxations in credit classification and loan loss provisioning. It largely helped the BFIs to maintain asset quality and profitability.
- The countercyclical buffer was suspended for a year.
- Restrictions were imposed on dividend distributions to preserve bank capital.
- Relaxations were provided on risk weights in specified assets.
- The BFIs were allowed to treat the income received up to three months later in the income of the previous year.

These measures helped maintain adequate liquidity in the market during the pandemic. The interbank rate remained below 1 percent and lending rate declined. This, in turn, boosted consumer confidence in continuing their business activities. The relaxations provided for the businesses in the form of interest discounts, deferrals, rescheduling and restructuring facilities and provision of refinance as well as concessional lending facilities helped the continuity of business firms.

(a) Concerns and Issues

Covid-19 has created challenges in the revival of economic activities in the economy. The tourism and transport sector became hard hit by the pandemic and are likely to take

longer time to revive. These developments have indirect impact of financial stability of the economy. It is because the BFIs have invested a significant amount of loan on those sectors. Thus, revival of the hard hit sectors is one of the issues of financial stability in Nepal.

One another issue is the management of asset quality. The NPL level of the BFIs did not increase much during the pandemic even if the businesses were severely affected by the crisis. A major reason for this was the relaxations provided by the NRB regarding asset classification and provisioning. However, with the lift of the relaxations, the NPL level could significantly increase and create challenges in maintaining financial stability.

(4) Challenges Posed by non-Bank Financial Institutions

The non-bank financial institutions (NBFIs) in Nepal have a history of more than seven decades. However, it is only after the adoption of liberalization policy in the mid-1980, the NBFIs experienced significant growth. The cooperative industry gained momentum in the late 1990's and early 2000's whereas the insurance market expanded rapidly during the last one and half decade. In addition, the contractual saving organizations such as Employee Provident Fund (EPF) and Citizen Investment Trust (CIT) have expanded their business during the last decade.

In Nepal, NBFIs mainly include insurance companies, contractual saving organizations, mutual funds and cooperatives. These institutions have served Nepalese financial system for more than seven decades.

Insurance business started in Nepal in 1947 with the establishment of Nepal Insurance Company Limited (NICL). However, even after 20 years from the establishment of NICL, no other institutions came into the market. The growth of insurance business occurred after the adoption of liberalization policy by the country in the mid 1980's. Currently, there are 40 insurance companies in Nepal with more than 2500 branches across the country. Nepal Insurance Board, established in 1969, regulates these companies under the provisions of Insurance Act, 1992.

EPF was established in 1962 as an autonomous body under the "Employees Provident Fund Act, 1962". It manages the provident fund in Nepal on behalf of the Government of Nepal for government, public enterprises and private sector employees. It has been entrusted to manage the Contributory Pension Scheme for the employees of Federal GoN and other public sector employees appointed from 2019/20.

CIT, a statutory institute under Citizen Investment Trust Act, 1991, was established in 1991 as an autonomous body. It operates and manages various types of retirement schemes/programs as well as various unit schemes and mutual fund program for both domestic and foreign investors to encourage people for saving and increase investment opportunities along with the dynamic development of the capital market.

The cooperative movement in Nepal began with the establishment of the first cooperative in 1957. Even though, the first Cooperative Act was enacted in 1960, growth of cooperatives took momentum only after the adoption of liberalization and open market economy in the 1980s. Currently, there are more than 29, 886 cooperatives in the country with more than 7.3 million members.

The financial system of Nepal is dominated by Banks and Financial Institutions (BFIs). As of April 2021, there are 140 BFIs including 27 commercial banks, 18 development banks, 20 finance companies, 74 microfinance financial institutions and one infrastructure development bank. On the other hand, there are 40 insurance companies, 29,886 cooperatives, one EPF, one CIT and one Postal Saving Bank working as major NBFIs.

The share of the BFIs in total assets of the financial system is 83 percent and the share of NBFIs is 17 percent. Among the NBFIs, the share of insurance companies in the financial system is 5.5 percent, followed by EPF (4.5 percent), cooperatives (4.5 percent), CIT (2.1 percent) and postal saving bank (0.2 percent).

\<Figure 3-12\> Structure of Nepalese Financial System

Source: Nepal Rastra Bank (2021)

The share of insurance companies in the total assets of the financial system has increased over the last decade from 3.1 percent to 5.5 percent, the share of EPF and cooperatives have slightly declined and the share of CIT has stood around 2 percent.

Total assets of the NBFIs are increasing overtime. It has increased from 2.7 billion USD in 2011 to 11.39 billion USD in 2020. The ratio of such assets to GDP has increased from 19.9 percent to 34.0 percent during the period.

\<Figure 3-13\> Assets of NBFIs in Nepal (in billion USD)

Source: Nepal Rastra Bank (2021)

There are 40 insurance companies currently operating in Nepal out of which 19 are life insurance companies, 20 non-life and one reinsurance company. The life insurance companies have 1969 branches and the non-life companies have 936 branches across the country. As of mid-March 2021, about 26 percent of the population have been estimated to have access to insurance services.

As of mid-March 2021, 29886 cooperatives are in operation in the country with a share capital of 803 million USD and 7.3 million members. The cooperatives have mobilized savings of 4.07 billion USD billion and outstanding credit stands 3.64 billion USD as of March 2021. This sector has created a direct employment for 88,309 people.

The NBFIs are an important part of Nepalese financial system. Yet, there are still challenges to be tackled in order to reap full potential from this sector. One of the issues is the productive use of resources mobilized by CIT and EPF. They are mobilizing a large chunk of contractual saving that can be available for longer term investment; however, such resources are mostly being utilized for personal lending to contributors and investing in fixed deposits at the BFIs. It is thus a challenging task to mobilize the funds for hydropower development, infrastructure projects and other productive activities.

Making provision of effective regulation and supervision in cooperative sector is another challenge. As the NBFIs are lightly regulated, they may carry out high risk investments and result in higher level of non-performing assets. This risk can be reduced by bringing them under the supervision of some competent supervisory agency while ensuring their role of financial intermediation in the economy. In case of Nepal, while insurance companies, EPF and CIT have some form of regulations, the cooperatives are largely unregulated and unsupervised. In such a case, any problem in these NBFIs can create systemic risk in the financial system. Thus, we need to ensure sound regulation and supervision practices for the NBFIs so as to maintain financial health and financial stability.

One another issue is the interest rate offered by the NBFIs. They generally offer higher interest rate on saving and might attract the funds from banking sector. Such flow of funds from formal banking to shadow banking sector can create complexities in the credit

management role of the central bank and can promote higher cost of fund in the banking sector.

NRB is moving towards the compilation of financial corporation survey which will include the balance sheet aggregates of BFIs as well as NBFIs. This is expected to strengthen the current liquidity and monetary management function of NRB.

2. Covid19's long term impacts on financial stability : Econometric Forecasting

A. Current Status of COVID-19 in Nepal

(1) COVID-19 cases

Since the first COVID-19 case (Jan. 23, 2020) was reported, Nepal has experienced two major waves up until early July, 2021. The peak of the first wave was around October 21, 2020 with the new daily cases of 5,743. The second wave of infection started in April, reaching its peak on May 14 with the new reported cases of 5,111. Since the peak of the second wave, the new daily cases have been on decline, but seem to be persistent around 1,600. As of July 13, the cumulative cases and the new daily cases are 658,778 and 1,639, respectively.

The vaccination started in January 2021 and the cumulative vaccine doses given are 3,653,173 with 1,041,366 people (3.5% of the total population) being fully vaccinated as of July 11, 2021. The portion of people who got at least one dose is 8.7% (2,611,807 people).

(2) Containment measures

In response to the pandemic, the government of Nepal imposed a nationwide lockdown

in March 2020 through July 2020. In August, for some areas such as the Kathmandu Valley, the government imposed mobility restrictions and social distancing measures.

These measures to cope with the pandemic helped bring down the new cases up until the mid-March, 2021. However, in April 2021, with the second major surge of the infections, GoN began progressively imposing restrictions and social distancing measures and eventually shut down most flights and closed all schools.

The mobility index

The google mobility indices clearly show how the spread of the virus infection and the containment measures affected the economic activity in Nepal. The indices measure the difference in mobility index for important categories of places, compared to the level seen in the pre-COVID period. The graph below presents the mobility indices for retail & recreation, parks, transit stations, and workplaces. The mobility in Nepal had a big fall in March 2020 in the wake of the lockdowns. The mobility had the second plunge following another major containment measures implemented in August, 2020. After this drop, the mobility was actually recovering to the baseline level until the government responded to the second wave of infection with nationwide lockdown measures.

<Figure 3-14> The google mobility indices - Nepal

Source: Google

(3) Impacts on the economy

Due to the global impact of the COVID-19 and the domestic containment measures implemented by the government of Nepal, Nepal economy was hit hard, resulting in the first contraction in forty years. Real GDP of Nepal decreased by 1.9 % in the fiscal year 2020. Both the service sector and the manufacturing sector saw contractions. The output of the service sector decreased by 3.6 % mainly due to the decreased activity in the tourism. The impact was also pronounced in the transportation and wholesale/retail sectors, which are closely related sectors with tourism activity. The impact was not limited to the service sector. The output in the manufacturing and construction sector also saw a contraction of 4.2 % because of the combined effect of the supply disruption and decreased demand. Now, Nepal economy is showing signs of rebound just like other countries along with the ongoing vaccinations.

The potential vulnerability

However, the risk of another waves of infection in Nepal and other countries poses a potential threat to Nepal economy, particularly considering that Nepal economy heavily depends on the tourism revenue and remittances. Many Nepalese workers in foreign countries send their income to their families in the home country. Many households rely on the remittance for their consumption. At the country level this remittance is also a major source for external payments and foreign reserves. The fact that Nepal has a chronic trade deficit highlights the importance of remittance. The major countries where Nepalese people are working are India, Malaysia and GCC countries such as Saudi Arabia, Kuwait and UAE. Because most of the workers are low skilled and easier to replace in the workplaces, any substantial and prolonged deterioration of the pandemic in these countries would translate into job losses and reduced income and remittance for Nepalese workers.

The tourism revenue also plays important roles in Nepal economy. Not only is the

revenue the source for foreign reserves, but also the number of tourist arrivals and their spending crucially affect the economic activity in other service sectors such as hotels, foods and restaurants and transportation. In the fiscal year 2019-2020, the number of tourist arrival dramatically dropped by 81% from the previous fiscal year to 230,085. The second half of year 2020 and first half of year 2021 saw another decline, resulting in a halt as the word itself. The major origin countries of the tourists include India, China, U.S., and European countries such as UK. Apparently, any worsening COVID-19 situation in these countries or Nepal would directly affect the number of tourists arriving in Nepal. But even if the spread of the virus seems to be contained at some point in time in Nepal, this may not necessarily mean more incoming tourists. Because the situation of the pandemic is always subject to a sudden worsening as experienced so far, potential tourists would make sure that a good medical service should be accessible in the country they want to travel to. This consideration would pose more difficulty for the government of Nepal because expanding the medical infrastructure and improving the quality of the medical service cannot be done over a short period of time. Nepal may need to come up with an efficient solution to deal with this issue in order to attract more tourists.

(4) Current status of financial stability in Nepal

The financial soundness indices in recent years

The tables below present key bank indicators for BFIs in Nepal in recent years. All the indicators were still within regulatory targets but many of them deteriorated relative the previous fiscal year.

The main indicators for the overall BFIs have somewhat deteriorated in the fiscal year 2019/2020 except the CCD ratio and the core capital ratio. Due to the subdued consumption and increased deposit, the CCD ratio and the deposit to GDP ratio went higher compared to the previous year. The credit to GDP ratio was higher utterly attributed to the credit increase in the commercial banks (CLASS A), which is in turn mainly due to the economic contraction. Across all banks, the NPL ratio became worse with the

overall NPL ratio (1.89%) up by 0.36 %p, though the ratio appears low despite the ongoing economic slump caused by the pandemic. The core capital ratio and the return on equity (ROE) both declined.

<Table 3-1> Financial Soundness Indicators of BFIs (CLASS A & B)

Indicators	CLASS A			CLASS B		
	2018 July	2019 July	2020 July	2018 July	2019 July	2020 July
Credit/GDP	70.24	72.17	77.26	8.42	9.96	7.63
Deposit/GDP	82.19	83.14	92.65	10.04	11.50	9.42
CCD	77.07*	75.36	69.93	72.78*	76.42	71.84
NPL/ Total Loan	1.41	1.40	1.81	1.09	0.92	1.52
Liquid asset/ Deposit	24.85	24.41	27.52	32.35	27.57	29.49
ROE	17.07	16.92	12.52	14.14	15.14	9.68
ROA	-	-	-	-	1.51	0.57
Core capital/ RWA	13.32	12.39	11.78	17.93	14.86	13.21

Source: NRB Financial Stability Report (2018, 2019, and 2020)

* LCY credit/(LCY deposit and core capital)

<Table 3-2> Financial Soundness Indicators of BFIs (CLASS C & Overall)

Indicators	CLASS C			Overall		
	2018 July	2019 July	2020 July	2018 July	2019 July	2020 July
Credit/GDP	1.91	1.98	2.00	80.57	84.11	86.89
Deposit/GDP	2.11	2.19	2.36	94.34	96.83	104.43
CCD	77.88*	74.01	68.46	76.81*	75.22	69.58

NPL/ Total Loan	10.83	8.80	6.18	1.60	1.52	1.89
Liquid asset/ Deposit	36.74	36.27	36.40	25.91	25.06	-
ROE	12.54	13.27	5.11	17.58	16.62	12.09
ROA	1.62	1.50	0.60	1.72	1.73	1.19
Core capital/ RWA	19.78	19.50	18.01	13.89	11.58	-

Source: NRB Financial Stability Report (2018, 2019, and 2020)

* LCY credit/(LCY deposit and core capital)

Recent Developments

According to the World Bank Group (2021), the growth of the credit to private sector declined by 6.9 %p to 12.4 % in the fiscal year 2020 (covering H2 '19 and H1 '20) compared to the previous fiscal year. This slowdown of the credit growth was due to the steep decline that occurred in Q2 '20 when the containment measures were taken to cope with the surging COVID-19 cases and economic activity was restricted. Between mid-March and July the net issuance of private sector credit dropped dramatically by 57.5 % y-o-y. The halt of credit growth in this period was particularly severe in some sectors such as tourism and construction sectors.

With the gradual recovery of the economic activity the credit growth in private sector showed a positive growth of 11.6 % (y-o-y) in the first half of the fiscal year 2021 (i.e. second half of the calendar year 2020). This resumption of growth was also due to the credit relief measures taken by the NRB.

The share of the credit ticked up for the agriculture and forest sector and for the consumption loan during the second and third quarter of the year 2020. The share for the wholesale and retail sector got bigger in the third quarter. On the other hand, the portion of the credit for household home purchases has continued the decline. The shares of manufacturing, construction and utility also decreased but the declining rates were mitigated in the third quarter compared to the previous quarters.

<Figure 3-15> The Sectoral Portions of the Credit (CLASS A)

Source: NRB, author's calculation

The deposit growth was robust in the first half of the fiscal year 2021. The increase in deposit was driven by more official remittances and more savings by households, particularly by rich households.

Despite the NRB's accommodative policy measures the major prudential indicators in the whole banking sector were still remaining within the regulatory targets. In H1FY21, the ratio of net liquid assets to total deposits were 26.8%, which is above the regulatory minimum of 20%. The CCD ratio (74.9%) was maintained below the limit of 85%. The capital adequacy ratio (CAR) was above the regulatory requirement of 11%. So far, the BFIs have been successful in keeping these measures under control partly with the help of increasing deposits.

The proportion of nonperforming loans out of total loans was 2%, which seems to indicate a good asset quality. However, presumably this good standing may be attributed to the NRB's policies on the repayment for the existing loans. That is, some loans which might have been classified as nonperforming loans in normal times, are being classified as performing loans under the current regime. Given that there still exists uncertainty

ahead regarding the pandemic situation and economic recovery, the NPL ratio may rise at some points depending on the economic conditions and the NRB's counter policy actions.

The three figures below plot the quarterly financial soundness indices (FCI) for the commercial banks (CLASS A) in recent three years, 2018-2020.

The regulatory Tier 1 capital to risk-weighted assets ratio was actually ticking down even before the pandemic. In the second quarter of year 2020, this ratio slightly improved relative to the preceding quarter (11.33% to 11.78%), but resumed the declining trend from the third quarter. The ratio marked 11.33 % in the last quarter of year 2020.

A liquidity ratio (liquid assets divided by the short term liabilities) was fluctuating in the year 2018-2019. It had a big drop in the last quarter of year 2019, and since then it is lingering around a lower level of 15.6%, being lower compared to the previous level (22.6% on average during the period, Q1'18 through Q3'19). The return on equity continued its downward trend but bounced in the last quarter of year 2020. The annual average ROEs for the three years are 21.28 %, 20.34 %, and 15.81 %, respectively. The return on assets (ROA) was also declining before the pandemic and further deteriorated during the pandemic except for the last quarter.

<Figure 3-16> Financial Soundness Indicators:
capital, liquidity ratios, and ROE (CLASS A)

Source: IMF

<Figure 3-17> Financial Soundness Indicators:
ROA and NPL ratio (CLASS A)

Source: IMF

<Figure 3-18> Financial Soundness Indicators:
Interest margin/gross income (CLASS A)

Source: IMF

(5) Financial stability issues

The central banks in the world have been acting in concert with the expansionary fiscal

policies to help the affected sectors survive and keep their economy being resilient for fast recovery in the post-COVID period.

Globally central banks have eased capital and liquidity requirements for financial institutions and also eased the classification of exposures. This unprecedented change of direction of the prudential policy may induce an excessive procyclicality of the financial system in the future when the economic uncertainty is substantially reduced and the economy is back on the normal growth path. The problem will get worse, turning into the insolvency issue and the deterioration in the banks' statement if the health emergency lasts longer than expected. In this case rapidly rising NPL and credit losses can be expected, which negatively affect the asset quality and capital adequacy of BFIs. In this case the BFIs will have to increase loan loss provision (LLP) against the potential credit losses while the revenue keeps falling. Increasing LLP will help with loan loss absorption but it may further erode a share of profits and the ability to strengthen the capital base. Therefore, in general it is important to monitor and forecast the size of NPLs to take preemptive prudential measures and maintain the financial stability in the banking sector.

On top of this general issue, the current situation caused by the pandemic throws additional issues for the regulators and deposit takers. The impact of the pandemic is economy wide. But the impact is quantitatively different across sectors and groups of people. The tourism sector, which takes a substantial portion in Nepal economy, was hit most strongly. In terms of firm size, the impact was deeper for the smaller enterprises. Among the vulnerable group of people are women, informal or temporary workers. Presumably, these more vulnerable sectors and people do not have enough access to the loan provided by the BFIs which are under jurisdiction of the NRB. In Nepal many people usually rely on small microfinance companies or cooperatives which are not under jurisdiction of the NRB. So, it is not clear how much these vulnerable groups are getting financial help for their survival. It is also unclear what's going on for the asset quality in these small but many financial institutions.

Also, the speed of recovery also differs across sectors. In the course of unwinding the financial relief measures, the NRB would have to carefully deal with this feature by for

example taking sector specific plans. To this end the NRB is called on to monitor the economic and financial status (e.g. sector wise economic activity and NPLs) more frequently.

B. Methodologies for Forecasting Financial Stability

(1) Concept and approach

This section discusses some popular tools to monitor and predict financial crises and financial stability in the banking sector. The financial crisis usually refers to the banking crisis and currency crisis in the whole economy. Our discussion in this report will be focused on the banking crisis in consideration of the exchange rate regime and the small portion of international investments in Nepal.

Financial crises

Predictability of potential banking crises is very important in order to make policy interventions in a timely manner. Many research (e.g. Claessens et al, 2011) highlight the cyclical behavior of important financial variables such as credits, house price and equity price. Each of these variables finds a cycle which have up/downturns and peaks/troughs. Usually banking crises occur between the peak and trough. Often these financial cycles are paralleled with business cycles (e.g. Claessens et al, 2009) and this feature provide the basis for predicting the banking crises. According to literature some important real/financial/external sector variables are found to have predicting power for the banking crises (e.g. Kaminsky and Reinhart, 1999). These variables are called 'early warning indicators'.

Macro stress testing framework

Now let's turn to the stability issue in individual banks. What is typically done is the

macro stress testing to forecast the impact of negative macroeconomic environments on the asset quality, profitability, liquidity and capital adequacy of individual banks or the banking sector. The macro stress testing framework is useful because it produces the predicted values for important variables so that the regulators can take micro or macro prudential measures in advance to avoid the potential financial distress of individual banks or the whole banking sectors.

(2) Prediction for financial crises

(a) Conventional early warning indicators

The concept for early warning indicators

As mentioned earlier, the conventional approach tries to find informative variables to predict financial crises. This approach takes the database for historical financial crises episodes of many countries and evaluates the prediction performance of candidate indicators. Early warning is on if the value of the indicator goes above or below a threshold value depending on indicators. A threshold value is differently set for each indicator.

Because there always exists a risk of missing crisis (type-I error) or making a false alarm (type-II error), almost always researchers evaluate the performance of indicators based on a noise-to-signal ratio. The exact definition of this ratio may be slightly different depending on the authors. In general, the type-I error (type-II error) gets bigger as the threshold value means more strict warning rule and less frequent calls (more frequent calls). As a result, a noise-to-signal ratio is crucially dependent on the specific threshold value being used.

Kaminsky and Reinhart (1999)

Kaminsky and Reinhart (1999) is one of the pioneering work in this area. They considered both the banking crisis and currency crisis. They search for threshold values

for each indicator with which the noise-to-signal ratio is minimized. In their definition, the noise rate is given by B/(B+D) and the signal rate is given by A/(A+C) (See the following table).

They considered sixteen economic variables as crisis indicators: seven financial sector indicators, six external sector indicators, two real sector indicators, and one fiscal sector indicator. The list of indicators is presented below. According to their results, some indicators have higher prediction power over the others. The real interest-rate differential, real interest rate, reserves, terms of trade, exports, output, and stock prices display higher performance followed by the ratio of M2 to reserves, M2 multiplier.

<Table 3-3> Noise-to-signal ratio (Kaminsky and Reinhart, 1999)

	Crisis occurs in the following 24 months	No crisis occurs in the following 24 months
Indicator issues a signal	A	B
Indicator does not issue a signal	C	D

Source: Kaminsky and Reinhart, AER, 1999

<Table 3-4> List of indicators and percent of crises accurately called (Kaminsky and Reinhart, 1999)

Sectors	Indicators	Thresholds and warning criteria	Percent of banking crises correctly called (%)
Financial sector	M2 multiplier	>0.90	73
	Domestic credit/GDP	>0.95	50
	Real interest rate	>0.80	100
	Lending-deposit rate ratio	>0.87	57
	Excess M1 balances	>0.91	32
	M2/reserves	>0.90	75
	Bank deposits	<0.16	67
External sector	Exports	<0.10	88
	Terms of trade	<0.19	96

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	Real exchange rate	<0.10	58
	Imports	>0.80	60
	Reserves	<0.28	92
	Real interest-rate differential	>0.81	100
Real sector	Output	<0.14	89
	Stock prices	<0.10	81
Fiscal sector	Deficit/GDP	>0.86	44

Source: Kaminsky and Reinhart, AER, 1999, Table 6

Some recent researches

Other researchers such as Aldasoro et al (2018) choose a threshold value such that the ratio of the prediction rate to the false alarm rate is maximized while capturing at least certain portion (a pre-set value) of the crises. The reciprocal of this ratio can be viewed a noise-to-signal. They considered credit-to-GDP gap, total DSR, household DSR, \household credit-to-GDP gap, property price gap as early warning indicators. Their main findings are (1) credit-to-GDP gap and total DSR performs well and in particular credit-to GDP gap indicator performs slightly better for financial crises in a longer horizon; (2) The property price gap performs well about two years before the crises while it may not be useful in the pre-crisis year; (3) The household DSR indicator is very informative, being comparable to the credit-to-GDP gap.

In particular, more recently the importance of the credit-to-GDP, the household DSR, and the property (or asset) price gap has been highlighted in many other papers including Borio and Lowe (2002), Borio and Drehmann (2009), Drehmann and Juselius (2012, 2014) among others. The importance of household debt also has been documented in Mian et al (2017), Jorda et al (2016), and Zabai (2017).

All of these results can give a useful guideline in constructing an early warning system for a specific country such as Nepal. However, there is one caveat when one chooses threshold values for early warning indicators. The specific threshold values for indicators suggested in existing literature may not perfectly fit Nepal. This is simply because those

suggested threshold values and even the set of indicators were derived from the past crisis experiences of other countries. Potential differences in the financial market and economic development between Nepal and those countries may render the direct applications of existing methods less useful. However, in spite of this caveat, the early warning system is still a useful tool for regulators which routinely monitor the conditions in the financial market because prudential measures can be taken in advance if they know in advance that a crisis is approaching.

(b) Early warning – other approach

Lo Duca and Peltonen (2013) propose an alternative approach to the early warning for the financial distress. They construct a country-specific financial stress index (FSI) and define the period of financial distress based on the percentile of the FSI for each country. Specifically, if a value of FSI in a certain time period exceeds the 90th percentile of the country's historical distribution of FSI, then that period is identified with the financial distress. See the box below for more detail. In next step a set of indicators can be examined on their prediction performance for this identified financial distress periods. In their paper they evaluate the forecasting ability of candidate indicators by applying the Logit regression to a country level panel data set.

This approach has several advantages over the traditional EWI approach. First, the FSI are constructed by reflecting the country-specific historical distribution (quartile) of the underlying variables which are used to construct the FSI. Second, this methodology does not require the sample span to have many historical crises episodes for the countries included in the dataset. Also, the countries in the dataset need not be economically or financially similar because a country-specific definitions for the FSI and the periods of financial distress is applied. This is in contrast with the traditional approach. In the traditional approach it is required to have a set of countries which are somewhat similar and comparable with Nepal and also experienced financial crises in the past. However, it would be impossible or practically infeasible to collect data for such countries satisfying the above two conditions.

<Box 3-1>

More details on the approach in Lo Duca and Peltonen (2013)

Construction of the FSI (Financial Stress Index)

The FSI is a country-specific composite index calculated for every quarter. The index is calculated based on the following components: the spread of the three month inter-bank rate over the three month bill rate, quarterly equity returns (only when the return is negative, being transformed into a positive value by changing the sign), the realized volatility of the equity index which is average daily absolute changes in the period, the realized volatility of the nominal effective exchange rate, and the realized volatility of the yield on the three month bill. In practice some of these components may be replaced by other variables to reflect the characteristics of the country being analyzed. Also, the measures for realized volatilities may be calculated with high frequency data (e.g. 15 minutes) if such data is available.

The FSI for a country in a given time period is defined as the simple average of the quartiles of each component. Here, a country-specific historical distributions for each component is applied to obtain the quartiles.

Identification of financial distress

In this step, a binary variable is constructed based on the value of the FSI. For a time period when the FSI moves above a pre-set threshold (90%) of the country distribution, then this time period is identified as the beginning period of financial distress. The value of 1 is given for this period and also for the preceding six periods (six quarters). Any subsequent periods with the FSI still above the threshold are dropped from the sample. By doing this, the resulting binary variable would represent an ideal leading indicator for systemic event (financial distress).

(3) Macro stress testing framework

(a) Full macro stress testing models

The central banks in many countries perform periodically a formal bank supervisory stress test. The macro stress testing framework is designed to assess the robustness of the banking systems to adverse macroeconomic stress conditions. The macro stress testing simulates adverse events and assesses the system vulnerability under the simulated adverse crisis events.

A typical procedure in the macro stress testing is as follows. First, generate a macro stress scenario using an econometric model. Some simplified framework such as Hirtle et al (2016) do not have this scenario generation module, instead borrowing an extraneous macro forecasts from other sources. Second, the default probabilities (DP) are estimated under a generated macro scenario. The DPs may be estimated separately for each group of borrowers (or industrial sectors). A DP estimation module can be set up only if detailed information on the borrowers are available. The BOK-07 model employs separate regression model for large firms, SMEs, and retail sector with the logarithm of the DP-odds ratio (DP divided by 1-DP) as the dependent variable. Each regression model uses different set of explanatory variables and some relevant macro or aggregate financial

variables are considered as the regressors. Once the DPs are estimated under a macro stress scenario, the credit risk analysis is implemented. Other risks such as market risk or interest risk are estimated under the generated macro stress scenario.

Finally, the key measures of asset quality, capital adequacy, liquidity, and profitability of the individual institutions and the whole sector are calculated. Further advanced models also consider the inter-bank contagion and real-financial feedback effects.

(b) The CLASS model

Hirtle et al (2016) propose a model called 'CLASS (Capital and Loss Assessment under Stress Scenarios)', which is a simplified macro stress testing model, mainly aiming to project net income and capital for individual banks and bank holding companies over a stress test horizon of two to three years. The forecasting results can be useful to project capital gap and additional capital needs at individual banks and assess the impact on the capital adequacy of the system.

This model does not have a scenario generation module, but any extraneous inputs can be used. The core of the CLASS model lies in a set of regression equations for important dependent variables. The dependent variables include net charge-offs (NCOs) for each type of loans and the components of the pre-provision net revenue such as net interest margin, return on trading assets, some expense ratios and so on. The lagged value of the dependent variables and some important macro variables are used as explanatory variables. Unlike any full-fledged macro stress testing framework, this model omits the DP module, instead directly estimating the relationship between revenue item or charge-off items and macro variables. So any potential heterogeneity in credit loss across various groups of obligors is not taken into account.

<Table 3-5> Core regression (Hirtle et al, 2016)

	Individual dependent variables	Pool of explanatory variables
Pre-provision net revenue (PPNR)	-Net interest margin -Noninterest nontrading	-lagged dependent variable -real GDP growth rate

	income ratio	-term spread
and securities items	-return on trading assets	-three month treasury yield
	-compensation noninterest	-stock market returns
	expense ratio	-change in BBB bond
	-fixed asset noninterest	spread
	expense ratio	-portion of residential estate
	-return on AFS securities	loans, industrial loans, credit
		card loans out of total loans
Net charge-offs items	NCO for each item below	-lagged dependent variable
	-residential real estate loan	-house price growth rate
	-commercial real estate	-commercial property price
	loan	growth
	-commercial and industrial	-change in unemployment
	loan	-time trend
	-consumer loans (credit	
	card and other consumer)	
	-other loans	

Source: Hirtle et al, JBF, 2016

(c) A parsimonious model-Grigoli et al (2018)

Implementation of the two stress testing frameworks in preceding sections require lots of data on bank-level variables and macro variables. The full stress testing models require access to micro data on the obligors for each bank among others. The CLASS model also needs a comprehensive data set on the bank characteristics and macro variables. Some of these variables are not available in Nepal, for instance the house prices and commercial property prices.

This section introduces a more simple and easier to implement methodology suggested by Grigoli et al (JBF, 2018). This methodology is composed of two main modules: a VARX model and a bank-level panel data estimation. A VARX model is used to simulate useful macro stress scenario. In the context of COVID-19 pandemic, our interest is in generating a plausible macro scenario(s) which can reflect the impact of COVID-19 pandemic.

The choice of endogenous and exogenous variables are crucial in this step. Grigoli et al (2018) provides forecasts of macro-financial variables for Ecuador. Their choice of

endogenous variables are real GDP, real credit and deposit (all in log). They only include the oil price as an exogenous variable, which is a reasonable choice given that Ecuador is an oil-exporting country. This particular choice of variables cannot be fully justified for Nepal economy. Next section will discuss this issue.

In the bank panel data analysis, they estimate the relationship between the NPL odds ratio (in logarithm) and some bank-specific variables plus macro-financial variables. Once the estimates on the regression coefficients are obtained, forecasts of the NPL ratio can be derived for each individual bank. Further analysis can be done to make forecast of the NPL ratio for the whole banking sector.

Their estimation strategy is different from the standard panel estimators such as the fixed effect estimator. In their model they allow for some common factors which are unobservable but potentially affect every individual cross section unit (i.e. bank). Due to the presence of the common unobserved factors, the error term in the panel regression displays cross sectional dependency and the standard estimators would lead to inconsistent estimation. To deal with the cross-sectional dependence, they employ the augmented MG (mean group) estimator (AMG estimator) proposed by Eberhardt and Bond (2009) and Eberhardt and Teal (2010). These estimators are consistent under the cross sectional dependence. But there are other alternative estimators such as the common correlated effects MG estimator (CCEMG) proposed by Pesaran (2006).

C. Financial Stability Forecasting in Nepal

(1) Generation of stress test scenarios (VARX)

Model specification

The VARX model is given by

$$Y_t = A_0 + \sum_{J=1}^{p} A_j Y_{t-j} + \sum_{J=0}^{q} F_j X_{t-j} + \epsilon_t,$$

where Y_t is a set of endogenous variables and X_t is a set of some exogenous variables. As mentioned earlier, the appropriate choice of endogenous and exogenous variables is crucial to generate a macro scenario (forecast). In addition, the specification should be able to simulate the impact of COVID-19 on the macro variables for Nepal economy.

To this end we consider real GDP, real balance of payment, real aggregate credit and deposit, the weighted lending rate, and the NEPSE stock index return. The real remittance is also considered as an endogenous variable.

As for exogenous variables, we may consider the real GDP of major GCC countries such as Saudi Arabia, and India among others. The tourist arrival is also used as an exogenous variable. We expect that real GDP of GCC countries or India should affect the amount of remittance because many Nepalese workers are employed in those countries. Also, under some scenario on the global COVID-19 prospect, we should be able to forecast its impact on the remittance via the economic activity in those foreign countries. Next, the tourist arrivals directly affect the trade balance and the balance of payment through the tourism revenue. The tourist arrivals should be also useful to gauge the impact of COVID-19 on the endogenous variables.

Once we obtain reasonable estimates on the regression coefficients, we can move on to the forecasting step. In this step, we need to use some forecasts for the exogenous variables which reflect the impact of COVID-19. For the economic activity in those foreign countries, we may use some extraneous forecasts or set up a simple model for a relationship between the economic activity and the COVID-19 related variables such as mobility indices or COVID-19 cases. For the tourist arrivals, we also need to set up a simple model. Because the major origin countries of the foreign travelers are India, U.S., China, and European countries such as UK, we need to relate the tourist arrivals to the COVID-19 status in those origin countries.

Data description

The variables used in the VARX estimation are all annual frequency (beginning from year 1974 ending at year 2019, sample size=46). But the India GDP was available from

year 1980 so the estimation sample size is only 40. The variable list and data sources are presented in the following table. All variables are in logarithm except the Nepal policy rate.

<Table 3-6> List of variables

Variable name	Unit of measurement	Data Source
Real GDP	100 mil NPR (in log, base year=2010)	World Bank
Real Credit	100 mil NPR (in log, base year=2010)	NRB Staff
Real Deposit	100 mil NPR (in log, base year=2010)	NRB Staff
CPI	2010 CPI=100 (in log)	World Bank
Policy Rate	%	NRB Staff
Tourist Arrival	Number (in log)	NRB Staff
Real Remittance	100 mil NPR (in log, base year=2010)	NRB Staff
India Real GDP	100 mil Rupee (in log, base year=2010)	World Bank

The credit and deposit are for the CLASS-A banks only. The two variables, Real Remittance and India GDP are used as exogenous variables in the model and the rest are all endogenous variables. The Tourist Arrival may be considered as being exogenous. But the estimation result showed that this variable may have some interaction with other endogenous variables, and furthermore the estimation results was more reasonable (in particular the impact (sign) of Tourist Arrival on the GDP in particular) when this variables is used as an endogenous variable. The author considered extended sets of variables including real consumption, real BOP (balance of payment), real FX reserve, real current account balance, real trade balance (total and service only, respectively), credit to GDP ratio, deposit to GDP ratio, Nepal stock index (NEPSE index), and real GDP of Saudi Arabia. But the estimation results with these variables were mostly not

significant.

Estimation results

The VARX models require a choice of lags to account for the dynamic relationship among the variables. Here the SBIC rule gave lag of 1 for our dataset. All other criteria such as AIC, HQIC and FPE suggested higher lags. But the limited number of observations and the data frequency for our data being considered, it is reasonable to choose a small number of lag to avoid larger standard errors and resulting statistical insignificance.

The estimation result for our model is presented in the following tables.

\<Table 3-7\> Estimation result for VARX, part 1

Variable name	Coefficient estimate	Standard error	p-value
Equation: Real GDP			
Lagged Tourist Arrival	.0134	.0206	.515
Lagged Real GDP	.1971	.1653	.233
Lagged Real Credit	.0768	.0366	.036**
Lagged Real Deposit	.0872	.0688	.205
Lagged CPI	.1631	.0487	.001***
Lagged Policy Rate	-.0037	.0027	.175
Real Remittance	.0006	.0111	.957
India Real GDP	.0625	.0598	.297
constant	4.0527	1.0713	.000***
Equation: Real Credit			
Lagged Tourist Arrival	-.0213	.0656	.745
Lagged Real GDP	-.4412	.5254	.401
Lagged Real Credit	.6934	.1162	.000***
Lagged Real Deposit	-.5046	.2185	.021**
Lagged CPI	.7301	.1547	.000***
Lagged Policy Rate	.0081	.0087	.350
Real Remittance	.0614	.0351	.081*

Variable name	Coefficient estimate	Standard error	p-value
India Real GDP	.6741	.1901	.000***
constant	.1724	3.4042	.960
Equation: Real Deposit			
Lagged Tourist Arrival	.1135	.0468	.016**
Lagged Real GDP	-.1068	.3761	.776
Lagged Real Credit	-.0153	.0832	.855
Lagged Real Deposit	.3538	.1564	.024**
Lagged CPI	.2651	.1108	.017**
Lagged Policy Rate	-.0013	.0062	.835
Real Remittance	.0467	.0252	.064*
India Real GDP	.5931	.1361	.000***
constant	-2.8040	2.4372	.250

Note: statistically significant at significance level of 10% (*), 5% (**), and 1% (***)

\<Table 3-8> Estimation result for VARX, part 2

Variable name	Coefficient estimate	Standard error	p-value
Equation: CPI			
Lagged Tourist Arrival	.0555	.0328	.090*
Lagged Real GDP	.4861	.2623	.064*
Lagged Real Credit	-.0733	.0580	.207
Lagged Real Deposit	.1613	.1091	.139
Lagged CPI	.7204	.0772	.000***
Lagged Policy Rate	-.0010	.0043	.826
Real Remittance	-.0279	.0175	.112
India Real GDP	-.1100	.0949	.246
constant	-3.2715	1.6998	.054*
Equation: Policy Rate			
Lagged Tourist Arrival	.9315	1.0236	.363
Lagged Real GDP	-6.2903	8.1964	.443
Lagged Real Credit	-1.8498	1.8136	.308
Lagged Real Deposit	2.3041	3.4086	.499
Lagged CPI	-1.7195	2.4136	.476
Lagged Policy Rate	.4479	.1357	.001***
Real Remittance	-.9809	.5484	.074*

India Real GDP	6.0226	2.9658	.042**
constant	-6.8285	53.1096	.898
Equation: Tourist Arrival			
Lagged Tourist Arrival	.0273	.2987	.927
Lagged Real GDP	-3.7934	2.3917	.113
Lagged Real Credit	.7592	.5292	.151
Lagged Real Deposit	-1.5869	.9946	.111
Lagged CPI	1.9469	.7043	.006***
Lagged Policy Rate	.0296	.0396	.454
Real Remittance	.1026	.1600	.522
India Real GDP	1.7986	.8654	.038**
constant	25.6744	15.4972	.098*

Note: statistically significant at significance level of 10% (*), 5% (**), and 1% (***)

For the GDP equation, lagged credit and lagged CPI have positive and statistically significant effect. India GDP and lagged tourist arrivals also have positive effect, suggesting that the Nepal economy is closely linked to the economic activity in India and more tourist visiting Nepal brings more economic activity (presumably, direct impact on service sector and indirect ripple effect in the other sectors). But these coefficients are not statistically significant at 10% significance level, which is possibly due to the small size of the data. For the credit equation, the credit displays positive relationship with its own lag, indicating some persistence in the credit. Next, the increase in India GDP may lead to deposit increase. The coefficient on the lagged tourist arrival is significantly positive as expected. The policy rate seems to be mainly affected by real remittance and India GDP.

Impulse Response Functions

The estimated reduced form coefficient in previous tables does not fully uncover the partial effect of the shock in each of the endogenous variables. The impulse response function can be referred to examine this partial effect. In this analysis, the Cholesky ordering is employed to identify the structural shocks and plot the impulse responses.

First, the positive credit shock brings a positive response of GDP, corroborating the economic expansion caused by credit expansion in a short term. A positive shock in the policy rate cause GDP to drop in the near term, but the impact dissipates afterwards. The credit and deposit increase in a response to a positive GDP shock. The responses of CPI and policy rate are also positive and negative, respectively when there is a positive shock in GDP. Thus, more economic activity leads to higher price level and a cut of policy interest rates, the latter of which may be indicative of the NRB's policy reaction function. However, possibly due to the relatively small sample size and the data frequency (annual), the confidence band of the impulse responses contain zero, failing to obtain statistically significant responses.

<Figure 3-19> Impulse Response Functions

A. impulse: Credit, Response: GDP

B. Impulse: Policy Rate, Response: GDP

C. Impulse: Deposit, Response: GDP

D. Impulse: Credit, Response: Deposit

E. Impulse: GDP, Response: Credit

F. Impulse: GDP, Response: Deposit

G. Impulse: GDP, Response: CPI

H. Impulse: GDP, Response: Policy Rate

Stress scenarios and forecasting

Upon the previous estimation results, one can go ahead to make forecasts of the endogenous variables. In do this prediction we are highly interested in the impact of COVID-19 crisis. There may be many channels in which the COVID-19 can affect the Nepal economy. First, global pandemic would affect the economic activity in some important countries (for example India) which are closely linked to the Nepal economy via trade. The economic contraction in those countries will affect the Nepal economy. Secondly the reduced economic activity in India or Saudi Arabia, for instance, may also have adverse effect on the amount of workers' remittance and eventually on GDP and domestic consumption. Third, people from foreign countries such as Europe, U.S, or China would be likely to cancel their trip to Nepal under severe pandemic situation, leading to reduced tourist arrivals and in turn reduced service sector activity in Nepal. On top of these, the domestic containment measures including lockdowns and social distancing in Nepal also has negative impact on the economic activity in Nepal. Thus, we

need to reflect consider these possible channels when we make forecasts.

The first three channels have almost exogenous nature, which can be reflected by assuming some specific values for the exogenous variables (India GDP and real remittance). The possible impact through the reduced travel arrivals is addressed by considering possible projections of the variable under each scenario. So the conditional forecasts are calculated given the values of tourist arrivals, India GDP, and real remittance under each scenario. For the last channel, one may give a negative shock in the GDP equation. The issue is to choose the shock with reasonable magnitude. One way to do this is to calculate the structural shock in the last estimation period and use this value. However, in consideration of the progress of vaccination and governments' shift from COVID-19 containment measures such as lockdowns and social distancing towards the 'with COVID-19', this type of shock may be repeated in future.

Three scenario are considered in this work: a normal scenario, COV-A scenario, and COV-B scenario. Each scenario differs in when the tourist arrivals returns to the level seen in year 2018; when the real remittance returns to growth seen before year 2019; the prospect for the India GDP growth rate. As for the India GDP growth rate, the numbers are inferred from the IMF WEO (world economic outlook). The growth rates for year 2020 thru 2022 are same as WEO (2021 July) and the growth rates after year 2023 are constructed by interpolations based on the forecast in WEO (2021, April).

<Table 3-9> Scenarios

Variable name	normal	COV-A	COV-B
Tourist Arrivals			
2020	50% of year 2018	50% of year 2018	50% of year 2018
2021	75% of year 2018	50% of year 2018	50% of year 2018
2022	100% of	75% of	50% of

	year 2018	year 2018	year 2018
2023	100% of year 2018	75% of year 2018	75% of year 2018
2024	100% of year 2018	100% of year 2018	75% of year 2018
2025	100% of year 2018	100% of year 2018	100% of year 2018
Real Remittance			
2020	Level in year 2019	Level in year 2019	Level in year 2019
2021	On a growth path	Level in year 2019	Level in year 2019
2022	On a growth path	On a growth path	Level in year 2019
2023	On a growth path	On a growth path	On a growth path
2024	On a growth path	On a growth path	On a growth path
2025	On a growth path	On a growth path	On a growth path
India GDP Growth (%)			
2020	-7.3	-7.3	-7.3
2021	9.5	8.5	7.5
2022	8.5	7.5	6.5
2023	6.8	5.8	4.8
2024	6.7	5.7	4.7
2025	6.6	5.6	4.6

It is assumed that the tourist arrivals vary depending on the scenario. Under the normal scenario, the tourist arrivals in year 2020 (2020-2021 FY) stays at 50% level of what was seen in year 2018. Then in year 2021 the arrivals increases to 75% level of year 2018. In year 2022 it fully recovers the level seen in year 2018 and stay at this level through year 2025.

Under COV-A scenario, the tourist arrivals continue to stay at the half level of year 2018 until year 2021. In the next two years it recovers up to 75% level of year 2018. In

year 2024 and 2025, a full recovery is assumed.

Under COV-B scenario is less unfavorable one than the other scenarios. The tourist arrivals stays at the half level of year 2018 until year 2022. It goes up to 75% level of year 2018 over the next two years. In 2025, it fully returns the level seen in year 2018.

Regarding the growth path of real remittance, the following results estimated for year 1997 thru 2018 was used.

$\log(\widehat{rremit_t}) = 5.6219 + 0.1516t$, where the annual growth rate is 15.16%.

In addition to these assumptions on the three variables, it is also assumed that the policy rate is held at 3%.

<Table 3-10> Forecasts of Major Variables

Scenario name	Real GDP growth	Real Credit growth	Real Deposit growth	Inflation
Normal Scenario				
2020	-0.022	-0.059	-0.202	0.065
2021	0.012	0.169	0.123	0.045
2022	0.043	0.144	0.165	0.055
2023	0.050	0.090	0.152	0.082
2024	0.047	0.081	0.118	0.089
2025	0.044	0.099	0.108	0.088
COV-A Scenario				
2020	-0.022	-0.059	-0.202	0.065
2021	0.011	0.150	0.109	0.051
2022	0.035	0.146	0.103	0.036
2023	0.042	0.100	0.134	0.062
2024	0.040	0.079	0.100	0.068
2025	0.041	0.079	0.126	0.085
COV-B Scenario				
2020	-0.022	-0.059	-0.202	0.065
2021	0.010	0.142	0.102	0.052
2022	0.034	0.127	0.087	0.041
2023	0.033	0.102	0.073	0.041
2024	0.036	0.083	0.118	0.064
2025	0.037	0.071	0.089	0.067

The GDP growth rate for 2020 is -2.2%, which is comparable to -1.9% (forecast by IMF).

The growth rate picks up in year 2022 to 4.3% under the normal scenario. The difference range of the GDP growth between the normal scenario and COVID scenarios are 0.01%p ~0.9%p (normal to COV-A) and .0.1%p~1.7%p (normal to COV-B). The average growth rates over year 2021-2025 are 3.9% (normal), 3.4% (COV-A), and 3.0% (COV-B), respectively. The average y-o-y rates of increase in real credit are 11.7%, 11.1%, and 10.5%.for the scenarios. For deposit, these rates are 13.3%, 11.4%, and 9.4%. The average inflation over the same periods are 7.2%, 6.0%, and 5.3%. One may assume different level of polity rate. Unreported results showed that higher policy rate (6%) tends to reduce the GDP growth but the magnitude was not practically large.

<Table 3-11> Forecasts of Major Variables

Scenario name	Real GDP (100 mil, NPR)	Real Credit (100 mil NPR)	Real Deposit (100 mil NPR)	CPI (2010=100)
Normal Scenario				
2020	17920.9	16335.1	16237.5	201.0
2021	18129.7	19092.4	18236.8	210.2
2022	18916.1	21848.2	21246.8	221.8
2023	19866.5	23809.9	24484.0	239.9
2024	20795.4	25745.9	27365.4	261.2
2025	21705.7	28282.9	30308.7	284.2
COV-A Scenario				
2020	17920.9	16335.1	16237.5	201.0
2021	18116.7	18788.5	18000.5	211.3
2022	18757.6	21533.8	19852.6	218.9
2023	19537.2	23682.7	22510.7	232.3
2024	20328.3	25552.1	24764.5	248.1
2025	21160.7	27566.9	27886.8	269.3
COV-B Scenario				
2020	17920.9	16335.1	16237.5	201.0
2021	18105.4	18662.2	17894.0	211.5
2022	18714.1	21035.9	19447.7	220.2
2023	19335.1	23191.0	20865.4	229.3
2024	20025.6	25109.6	23328.9	244.0
2025	20756.8	26904.5	25408.7	260.3

(2) Commercial banks panel data analysis

In this analysis, we use bank-level panel data to estimate the relationship between key bank variables (dependent variable) and regressors. The general regression equation (ARDL model) is given by

$$y_{i,t} = \alpha_i + \rho_i y_{i,t-1} + \sum_{k=1}^{n} \beta_{i,k} x_{t-k} + \sum_{k=1}^{m} \delta_{i,k} z_{i,t-k} + d_i g_t + u_{i,t},$$

where x_t is a set of macro variables, $z_{i,t}$ is a set of bank-specific covariates, and g_t represents a set of some common unobserved factors. The common unobserved factor may particularly capture the potential inter-bank linkages. The regression coefficients also depend on the cross-section unit, that is we allow for the slope heterogeneity. The factor loading d_i is different across the individual banks. As mentioned earlier the presence of this common unobserved factors renders the standard estimators such as the fixed effect estimator.

Grigoli et al (2018) include only one macro variables, the real GDP growth for x variable. Other macro or global variables such as global interest rate turned out to be statistically insignificant. They considered some bank-specific covariates as additional regressors but settled with only two bank-specific variables, the bank-specific growth of the real credit and deposit. Other covariates such as real salaries turned out to be insignificant. In our analysis, we consider more bank-specific variables such as the portion of the credit to household, residential home, and some important industrial sectors because the loan composition may affect the overall asset quality.

Grigoli et al (2018) consider only the NPL odds ratio (in logarithm) as the dependent variable. The non-performing loans (or ratio) is still important in our analysis. However, we can also consider other important aspect of the banking industry. The profitability indices or capital adequacy measure could be considered for further analysis.

For the estimation, we employ the CCEMG estimators proposed by Pesaran (2006). The regression parameters are allowed to vary across cross section units (banks) and the

CCE estimator estimates the population mean of the individual banks' coefficients.

In the forecasting step, the generated forecast in the VARX module should be used as inputs to obtain forecasts of the dependent variables. Also, we will need forecasts for the bank-specific explanatory variables and common factors, which may require separate models.

There may be some limitations in this analysis. First, the bank panel data only covers the CLASS-A (commercial banks). Even though the percentage share of the commercial banks out of the whole financial sector is over 60%, other important classes such as development banks, cooperatives, and microfinance institutions (MFIs) are not included in the dataset. Second, the NPL ratio reported by CLASS A banks may not fully reflect the potential ongoing deterioration of asset quality because the NRB's policy measures of credit relief and eased asset classification might have caused underestimation of the risk. Thus, some NPL data in the year 2020, in particular from the second quarter, should be interpreted with a caution and we need to address this issue.

Data description

The bank panel data provided by the NRB staff covers 39 quarters beginning from Q1 2011 ending at Q3 2020. The number of cross section units (banks) is 27. The raw data contains many bank-specific characteristics regarding the size of deposit and credit, sectoral portions of credit for major 10 sectors, total nonperforming loans, capital, total/liquid asset, interest income, net profit, ROA and ROE. The data for CLASS B, C and D was not obtained. Recently, the NRB started to report the monthly statistics for all BFIs at the NRB website but these data can't be used due to the limited data span although it would be useful source for further analysis in future. The dataset we obtained from NRB also contains some macro and financial variables at quarterly frequency: weighted lending and deposit rate of the CLASS A banks, CPI, and NEPSE index.

Model Specifications

The panel regression was considered for two different dependent variables: the odds

ratio of NPL ratio in logarithm $(\log(\frac{n_{it}}{1-n_{it}})$ with $n_{it} = \frac{NPL_{it}}{total\ loan_{it}})$ and the ROA (return on assets). The former is a major indicator for bank' asset quality and the latter is a measure of profitability. The considered estimation method is CCEMG (common correlated effect mean group) estimator (See Pesaran (2006), Chudik and Pesaran (2015)). After comprehensive preliminary investigation on the model selection, the following set of regressors were chosen.

<Table 3-12> Model specifications for bank panel analysis

	Dependent variables	
	Asset quality: $\log(\frac{n_{it}}{1-n_{it}})$	Profitability: ROA
Estimation method	CCE-MG	CCE-MG
Regressors	1. Lagged dependent variable	1. No lagged dependent variable
	2. Bank-specific characterisitcs: the sectoral portion of real estate loans	2. Some functions of bank-specific variables and macro/financial variables (to be introduced)
	3. Macro/financial variables: the GDP growth rate, detrended credit to GDP ratio, lagged detrended credit to deposit ratio	3. Macro/financial variables: weighted deposit rates for CLASS A banks and stock index return
	4. Cross sectional averages of the dependent variable and bank-specific variable	4. Cross sectional averages of the dependent variable and the variables in 2.

For the asset quality regression the lagged dependent variable is used as a regressor in order to reflect the persistence in the dependent variable. So the dynamic CCE-MG

estimator should be considered for estimation in which some lags of the cross section averages of the dependent variables and all bank-specific regressors are additionally used to capture the unobserved common factor. But the unreported results suggested that those additional lagged cross section averages are insignificant. Also other variables were considered for use. Those include 1. the sectoral loan portions of household credit, residential home, consumption credit, agricultural and forest, manufacturing, construction, wholesale/retail, and hotel/restaurant; 2. Individual bank-level credit/deposit growth rates, credit to deposit ratio. None of these variables were statistically significant. Also some alternative variables were considered to measure the cycle of credit market. As for one of them, the cointegrating regression for aggregate credit and GDP variable (both nominal) was estimated and obtained the residuals (i.e. deviation from the long run relationship). When this variable replaced the detrended credit/GDP ratio, the coefficient was not statistically significant.

The final choice (Table 3-9) include the lagged dependent variable, the portion for real estate loan (bank-specific), GDP growth rate, the lagged value of the detrended credit/GDP ratio and contemporary detrended credit to deposit ratio. The cross section averages of two variables, the dependent variable (the function of NPL ratio) and the portion for real estate loan are added to approximate the unobserved common factors.

$$y_{it} = \alpha_i + \beta_{1i} y_{i,t-1} + \beta_{2i} \hat{u}_{t-1}^{CG} + \beta_{3i} \hat{u}_t^{CD} + \beta_{4i} estate_{i,t} + \beta_{5i} \bar{y}_t + \beta_{6i} \overline{estate}_t + \epsilon_{it}$$

The rationale for each of the explanatory variables are as follows. The asset quality tend to persist over time, creating temporal dependence (positive correlation). The lagged dependent variable as an explanatory variable can capture this temporal dependence, also contributing to higher R-sqaure of the fitted model. That the GDP growth rate affects the asset quality of BFIs is a well-known fact. In periods of economic expansion (contraction) , the asset quality tends to get better (worse). Next, the detrended credit/GDP ratio (the residual $\hat{u}_t$) in the following regression is included to capture the credit market cycle:

$$\left(\frac{credit}{GDP}\right)_t = \delta_0 + \delta_1 t + u_t$$

$$\left(\frac{\widehat{credit}}{GDP}\right)_t = 1.3264 + 0.0566t$$

When the financial market is overflown with too much credit relative to GDP, the asset quality may deteriorate in future. But in many countries including Nepal, the raw credit/GDP ratio displays deterministic linear trend. Thus this raw ration may be not informative of the credit market cycle. In this report, the simple detrended ratio (deviation from the linear trend) is used. When this deviation is positive, it implies that too much credit has been provided and vice versa. In the estimation, it was found that the lagged (lag=1) value of this deviation ($\hat{u}_{t-1}^{CG}$) is statistically significant in explaining the asset quality in the current quarter. So the credit cycle in a quarter prior to current quarter seems to be informative of the asset quality. All other lags or the deviation in the current quarter turned out to be statistically insignificant. Along with this variable, the detrended credit to deposit ratio ($\hat{u}_t^{CD} = \left(\frac{credit}{deposit}\right)_t - 0.7031 - 0.0050t$)was also included as a regressor.

But unlike the credit to GDP ratio, the detrended credit to deposit ratio in the same quarter was used on the basis of the statistical significance. Next, the only bank-specific variable that matters in this regression was the portion for real estate loan of individual banks. In literature it has been reported that the household credit or residential mortgage loans are important factors that are closely related to business cycle or financial stability (e.g. Mian et al (2017) and Zabai (2017)). However, those variables were not statistically significant in the estimation result for Nepal Class-A BFIs. One may raise a concern over the potential endogeneity of the real estate loan variable. It might be the case that the real estate loan is riskier than other loans, leading to poor asset quality. But also it might be the case that in a point of time the economy is expanding and the real estate is considered profitable quality assets, attracting many leveraged investors. In this case the commercial banks would be willing to increase the real estate loan. To explain this issue in our model, the error term may contain unobserved factor which is correlated with this particular variable. It may be true that the common factor affect the asset quality in one direction

while the partial effect of the particular variable on the asset quality takes the opposite direction. This endogeneity issue may be somewhat fixed by adding the cross section average of the real estate variable as a regressor in the CCE-MG estimation. The coefficient on the real estate loan variable would estimate the partial effect on the asset quality while the coefficient on the cross section average of the variable would represent the effect of the unobserved factor.

Estimation results

The sign of the coefficient estimates are as expected and most of the estimates are statistically significant. The positive sign of the coefficient on the lagged dependent variables reflects the positive temporal dependence in the dependent variable. The coefficient on the lagged detrended credit to GDP also has positive sign, which means that too much credit relative to GDP size in the preceding quarter is a good indicator of poor asset quality in the current quarter. The detrended credit to deposit ratio has also positive coefficient. Again too much credit relative to deposit deteriorates the asset quality.

The GDP growth rate has negative coefficients, being consistent with the intuition. Higer economic growth leads to higher asset quality and less nonperforming loans. Higher loan portion in real estate decreases the asset quality, suggesting that this type of loans is risker, being likely to become poor assets later. The two cross section average (CSA) variables are included in the CCE estimation to capture the impact of unobserved common factors. In current context, the unobserved common factor may reflect the conditions in credit markets and macro economy as well as the potential contagion risk among BFIs. In this regression the CSA of the dependent variables may capture the state of the whole credit market that are not fully reflected in the other regressors. Its coefficient is highly statistically significant and positive. The CSA of the real estate loan portion has negative sign, being also statistically significant. One possible interpretations on the estimation results for the Real estate variable and its CSA may be as follows. The CSA of the variables being high means that real estate loans are profitable assets with low likelihood of becoming NPLs, which occurs typically in economically good times. In

good times the asset quality of other credit assets may improve together. This explains the sign of the coefficient of the CSA of real estate loan variable. However, when the unobserved factors (CSA) are controlled for, more estate loan by an individual bank would negatively affect the asset quality of the individual bank. This explains why the coefficient on real estate variables could be positive.

<Table 3-13> CCEMG estimation result for asset quality

Variable name	Coefficient estimate	Standard error	t-statistic	p-value
Dependent variable: $\log(\frac{n_{it}}{1-n_{it}})$				
Lagged dependent variable	0.5042	0.0517	9.76***	0.000
Lagged detrended credit/GDP	0.2161	0.1155	1.87*	0.061
Detrended credit/deposit	1.0750	0.4823	2.23**	0.026
Real estate	3.8861	1.5047	2.58***	0.010
GDP growth rate	-0.3207	0.2308	-1.39	0.165
CSA of dependent variable	0.7602	0.1370	5.55***	0.000
CSA of Real estate	-8.2798	2.7568	-3.00***	0.003
constant	1.4943	0.6159	2.43**	0.015

Note: statistically significant at significance level of 10% (*), 5% (**), and 1% (***)

Forecasting (NPL ratio)

In this practice, we forecast the NPL ratio for each bank. Consider the CCE regression:

$$y_{it} = \alpha_i + \beta_{1i}y_{i,t-1} + \beta_{2i}\hat{u}_{t-1}^{CG} + \beta_{3i}\hat{u}_t^{CD} + \beta_{4i}estate_{i,t} + \beta_{5i}\bar{y}_t + \beta_{6i}\overline{estate}_t + \epsilon_{it}$$
$$= A_{it} + \beta_{5i}\bar{y}_t + \epsilon_{it}.$$

Since the result presented in Table 3.13 is the CCE mean group estimates (average of estimates across banks), we cannot use those results for predicting the asset quality for individual banks. Instead we use the CCE estimates for individual banks, which is also provided in STATA. One problem is that the regression above involves the cross section average of the dependent variable in the right hand side, which in turn depends on the predicted value for individual unit. However, one can obtain the predicted values in the

following way.

Summing the above regression over cross section units and dividing by the number of banks (N) gives

$\widehat{\bar{y}}_t = \frac{1}{N}\sum_{i=1}^{N}\widehat{A_{it}} + \frac{1}{N}\sum_{i=1}^{N}\hat{\beta}_{5i}\,\widehat{\bar{y}}_t$. Thus we get $\widehat{\bar{y}}_t = \left(\frac{1}{N}\sum_{i=1}^{N}\widehat{A_{it}}\right) / \left(1 - \frac{1}{N}\sum_{i=1}^{N}\hat{\beta}_{5i}\right)$.

So, after calculating this predicted average, one can obtain the forecasts for individual banks using this equation. i.e. $\hat{y}_{it} = \widehat{A_{it}} + \hat{\beta}_{5i}\widehat{\bar{y}}_t$.

In this forecasting, the predicted value for the annual GDP growth rates and real aggregate credit and deposit from the VARX were used under each scenario. The quarterly values were obtained by applying the implied quarterly rate of change to the previous quarter value (beginning from 2020Q4). For the real estate variable, the average values in year 2020 was assumed for each bank. So this variable is held fixed over the forecasting horizon(2020Q4 through 2025Q4). The prediction results suggest that the NPL ratios (simple average of banks) are well below 2% over the forecasting horizon. The NPL ratios are not very sensitive to the scenarios in consideration. Actually, the NPL ratios are slightly lower in the COV-A or B than the normal scenario. This may be the case because under COV-A or B scenario the credit shrinks faster than GDP or deposit, reducing the values of the credit to GDP ratio or credit to deposit ratio.

<Table 3-14> NPL ratio prediction results
(simple average of NPL ratios across banks)

Year/Quarter	normal	COV-A	COV-B
2020Q4	0.0147	0.0147	0.0147
2021Q1	0.01255	0.01251	0.0125
2021Q2	0.00916	0.00893	0.00886
2021Q3	0.00551	0.00516	0.00504
2021Q4	0.00285	0.00251	0.00239
2022Q1	0.00109	0.00092	0.00086
2022Q2	0.0003	0.0003	0.00028
2022Q3	0.00023	0.00027	0.00026

Year/Quarter			
2022Q4	0.00023	0.00028	0.00027
2023Q1	0.00022	0.00028	0.00028
2023Q2	0.0002	0.00026	0.00028
2023Q3	0.00018	0.00025	0.00029
2023Q4	0.00017	0.00024	0.0003
2024Q1	0.00016	0.00023	0.00028
2024Q2	0.00016	0.00022	0.00027
2024Q3	0.00015	0.00021	0.00025
2024Q4	0.00015	0.0002	0.00024
2025Q1	0.00014	0.00019	0.00023
2025Q2	0.00014	0.00018	0.00022
2025Q3	0.00014	0.00017	0.00021
2025Q4	0.00014	0.00016	0.0002

However, this favorable results may mask the potential risk that can happen when the government and NRB take policy measures to expand the credit to cope with the economic disruption during COVID-19 pandemic. The following table presents the simple average of NPL ratio when more credit is provided in year 2020 and year 2021. The results show that the asset quality may quickly deteriorate if more credit is provided than implied by the dynamics of the economy. When the aggregate real credit is provided by additional 50% in year 2020 and 2021 more than the model predictions (VARX), the simple average NPL ratios will go up quickly to 20% in 2020Q1 and approach 100%. This model prediction may exaggerate the actual asset quality (weighted asset quality for the entire CLASS-A banks), which may be due to the use of CSA of dependent variable in the CCE-MG estimation. In spite of this potential issue, the results highlight the importance of the macro prudential policy in the economic downturn.

<Table 3-15> NPL ratio prediction results
(with additional credit in year 2020 and 2021)

Year/Quarter	Normal scenario		
	5%(year 2020) 0%(year 2021)	5%(year 2020) 5%(year 2021)	5%(year 2020) 10%(year 2021)

2020Q4	0.015675	0.015675	0.015675
2021Q1	0.015451	0.016464	0.017542
2021Q2	0.014055	0.018843	0.02601
2021Q3	0.010959	0.025139	0.081116
2021Q4	0.007104	0.050778	0.402391
2022Q1	0.003662	0.205953	0.738635
2022Q2	0.001276	0.595413	0.813711
2022Q3	0.000296	0.780543	0.851796
2022Q4	0.000207	0.82466	0.852195
2023Q1	0.000193	0.852086	1
2023Q2	0.000177	1	1
2023Q3	0.000164	1	1
2023Q4	0.000153	1	1
2024Q1	0.000146	1	1
2024Q2	0.00014	1	1
2024Q3	0.000136	1	1
2024Q4	0.000132	1	1
2025Q1	0.00013	1	1
2025Q2	0.00013	1	1
2025Q3	0.00013	1	1
2025Q4	0.000129	1	1

Policy implications

The main message regarding the asset quality is that the credit should not be overly provided relative to GDP or deposit. The credit to GDP or credit to deposit ratios in Nepal has linear trend. NRB needs to monitor and control the total amount of aggregate real credit so that the deviations of these two ratios from the trends may not go higher too much. Any excessive deviation above the trend may bring deterioration of the asset quality and financial instability in the banking sector.

Additional analysis (ROA)

Now let's turn to the second regression with ROA being the dependent variable. One might choose a regression model (explanatory variables) by a similar way as done for the

first regression. That is, include all possibly relevant variables and search for a good model which produce reasonable estimation results. However, this approach didn't work for this ROA regression, commonly for the CCE-MG and fixed effect estimation. So, a different approach was considered to find a set of relevant explanatory variables. This approach is based on the simple definition of the ROA and some approximations. The goal of this approach is to find out the important variables to be used for a regression. For details, see <Box 3-2>.

<Box 3-2>

A Simple Model for the ROA (return on assets)

Decomposition of ROA

The return on asset (with index i being subdued) in time t can be written as:

$$ROA_t$$
$$= \frac{credit_t(1 - n_t) \cdot r_t^{lend} - deposit_t \cdot r_t^{depo}}{credit_t + other_t} + \frac{other_t \cdot r_t^o}{crdit_t + other_t} - \frac{other\ expense_t}{credit_t + other_t}$$
$$\equiv A_t + B_t + C_t$$

Here n_t is the NPL ratio, $other_t$ is non-credit asset, A_t represents the income from the performing loan deductive of the interest payment on deposits divided by the total asset, B_t represents the income from other assets divided by the total asset, and C_t is other expense divided by total assets.

Note that

$$credit_t = credit_{t-1} \cdot (1 + g_t^{cr}) \text{ and } deposit_t = deposit_{t-1} \cdot \left(1 + g_t^{dp}\right)$$

where g_t^{cr} and g_t^{dp} are growth rates for credit and deposit of individual bank,

respectively. Denote $z_t \equiv \frac{other_t}{credit_t}$.

One can show that

$$A_t = \frac{(1-n_t)\cdot r_t^{lend}}{1+z_t} - \frac{\left(\frac{D}{C}\right)_t \cdot r_t^{depo}}{1+z_t} \quad \text{with} \quad \left(\frac{D}{C}\right)_t \equiv \frac{deposit_t}{credit_t}.$$

By applying the first order approximation around $z = 0$ to the function $h(z) = \frac{a}{1+a} \cong a(1-z)$, one can obtain

$$A_t \cong (1 - n_t) \cdot r_t^{lend}(1 - z_t) - \left(\frac{D}{C}\right)_{t-1}(1 + g_t^{dp} - g_t^{cr}) \cdot r_t^{depo}(1 - z_t)$$

$$= r_t^{lend}(1 - z_t) - n_t \cdot r_t^{lend}(1 - z_t) - \left(\frac{D}{C}\right)_{t-1} \cdot r_t^{depo}(1 - z_t)$$

$$- \left(\frac{D}{C}\right)_{t-1} \cdot r_t^{depo}(1 - z_t)(g_t^{dp} - g_t^{cr}) \equiv x1_t + x2_t + x3_t + x4_t.$$

Next, $B_t = \left(1 - \frac{1}{1+z_t}\right) \cdot r_t^o$, where r_t^o represents the overall interest rate on the non credit assets. Finally, one can decompose the other expense into LLP (loan loss provision) and non LLP expense. Additionally assume that LLP is a fraction (β) of the NPL and the ratio of non LLP expense to total assets is held fixed (α). Upon these assumptions C_t may be rewritten as $C_t = \alpha + \frac{1}{1+z_t}\beta n_t$.

Now define $x5_t \equiv \left(1 - \frac{1}{1+z_t}\right)$ and $x6_t \equiv \frac{1}{1+z_t}n_t$.

Regression model for ROA

The regression model is given by

$$ROA_{it} = \alpha_i + \beta_{1i}x1_{it} + \beta_{2i}x2_{it} + \beta_{3i}x3_{it} + \gamma_{1i}r_t^{depo} + \gamma_{2i}r_t^{nepse} + d_i g_t + u_{it},$$

where r_t^{depo} and r_t^{nepse} are jointly proxies for r_t^o. Note that only $x1$ through $x3$ are included as bank level regressors. To approximate the unobserved common factor, the cross section averages of ROA, bank level regressors and $x1$ through $x6$ was

used considering the interpretability of the estimation result.

Further discussion

The highly nonlinear form of ROA in the decomposition implies that linear regression with underlying individual variables may not work. The above regression contains the new variables (denoted as $x1$ through $x6$) that are nonlinear functions of the underlying individual variables. However our choice of explanatory variables has also limitations. First, these newly identified variables were obtained by taking first order approximation. Secondly we approximate the return on non credit asset (r_t^o) by stock return and deposit return. The possibly better proxy may be the interest rates on government bonds. The government bond yield data is available at the NRB website but only for recent short period of time, which makes it impossible to use for the current analysis. Also, the lending and deposit rates used in the estimation are market-wide rates since the rate for individual banks were not available.

The following table presents the estimation result (CCEMG) for the ROA regression. First the three bank specific regressors (X1, X2, and X3) has the sign of coefficients as expected. X1 is proportion to the weighted lending rate so higher value of X1 brings higher profitability (ROA). X2 is among others proportional to the NPL ratio and its coefficient should have negative sign when other regressors, especially X1 is controlled for. X3 among others is proportional to the interest rate for deposit and the lagged value of bank-specific deposit-credit rate. The negative coefficient on this variable also makes sense because the higher deposit rate or higher deposit to credit ratio (less use of source for credit assets at the individual level) should lower the profitability. The coefficients on stock return and deposit rate have positive but not significant for the latter. The significance of the CSA of ROA indicates the importance of unobserved factor. This CSA being higher implies the overall profitability of the commercial banks are higher, which happens when the financial market is stabilized and the economy is in a good shape. Mostly the rest of the CSAs has expected sign of coefficients, although they are not

statistically significant.

<Table 3-16> CCEMG estimation result for profitability (ROA)

Variable name	Coefficient estimate	Standard error	t-statistic	p-value
Dependent variable: ROA				
X1	124.0015	41.1977	3.01***	0.003
X2	-2190.3510	1041.593	-2.10**	0.035
X3	-137.1778	73.1736	-1.87*	0.061
Stock return	3.8309	1.5912	2.41**	0.016
Deposit interest rate	0.1123	0.6759	0.17	0.868
CSA of dependent variable	0.9407	0.2236	4.21***	0.000
CSA of X1	30.0206	101.873	0.29	0.768
CSA of X2	167.9620	2609.823	0.06	0.949
CSA of X3	-92.9598	172.4805	-0.54	0.590
CSA of X4	-35.3469	223.5506	-0.16	0.874
CSA of X5	-2.5809	4.1867	-0.62	0.538
CSA of X6	-139.3440	266.9074	-0.52	0.602
constant	1.1779	8.2513	0.14	0.886

Note: statistically significant at significance level of 10% (*), 5% (**), and 1% (***)

IV. Optimal macroprudential policy approaches after Covid19 in Nepal

1. Short term macroprudential policy agenda after Covid19 in Nepal

The modern financial system is characterized by innovation as well as increasing interlinkages. This is contributing not only to complexity but also fragility of the overall financial system. Policymakers all over the world have growing concern to safeguard international financial stability. The banking regulation prior to the global financial crisis was predominantly micro prudential. As a result of interconnectedness in the financial system, what may look stable at individual level can be unstable and fragile at the macro level (Hellwig, 1995). The issue of systematic risk arises with real importance.

The Basel committee on banking supervision (BCBS), in December 2010, introduced a global regulatory package which is called Basel III. The principal objective was to cushion the shocks of the financial crisis. The framework has emphasis on systematic risk and stability of the financial system. The International Monetary Fund (IMF) also launched an integrated Macroprudential policy (IMAPP) database which provides updates regarding use of Macroprudential measure along with institutional arrangements to support macro prudential policy.

Central banks (CB) typically hold the primary role to advocate and maintain financial stability. In the case of Nepal, Nepal Rastra Bank (NRB), is the authority responsible for implementation of macro prudential policy hand on hand with micro prudential policy and monetary policy to ensure financial stability. Although NRB is paying sufficient attention to potential risk factors through preparing financial stability reports and implementation of macro prudential regulations, a full framework of macro prudential policy is yet to develop in Nepal.

A. Current status of macroprudential policy in Nepal

As like other central banks around the world NRB also focused for micro prudential regulation before global financial crisis. The lesson after the crisis and following the global best practices, NRB also moved towards the implementation of macro prudential policies in order to attain financial resilience. NRB Act 2002 has given full authority to NRB for regulation and directions to banks and financial institutions (BFIs). NRB is the designated Macroprudential authority and power to issue macro prudential regulation is given to the governor. There is Financial Stability Oversight Committee headed by the senior deputy governor. The principal mandate for the committee is overseeing the risk in financial system and maintains the financial resilience.

NRB currently using several type of macro prudential tools viz; Broad-based (Counter cyclical capital buffer, Capital conservation buffer, Leverage ratio, etc.), Household sector (cap on credit growth to the household sector, Loan to value ratio, Debt service to income ratio, etc.), Corporate sector (Loan to value ratio for real estate credit, Foreign currency denominated loans), Liquidity tools (Liquidity buffer requirements, Liquid asset ratio, Statutory liquidity ratio, Loan to deposit ratio, reserve requirements, Limits on foreign exchange positions, Constraints on foreign exchange funding, etc.), systematic liquidity risk and fire sale risk in nonbanking sector (Limits on securities lending market), measures to mitigate risk from interconnectedness (Limits on size of exposures between financial institutions). The major regulatory provisions in practice having attributes of macro prudential regulations are summarized below.

(1) Leverage ratio and SIFI measures

NRB introduced leverage ratio from Mid July 2016. The major objective of leverage ratio is constrain the build-up of leverage in the banking sector, helping avoid destabilizing deleveraging process which can damage the broader financial system and the economy and reinforce the risk based requirements with a simple, non-risk based

backstop measures. After parallel run of leverage ratio of 4 percent from mid July 2016 to mid July 2018, it has been migrated to pillar 1 as prescribed by BASEL.

Similarly NRB is in the process of identifying systematic financial institutions and to formulate additional regulatory measure for those institutions. This would help to recognize the systematic risk so as to prevent too big to fail.

(2) Credit to core capital and deposit (CCD) ratio

This tool is introduced for the first time in 2009/10. Initially the ratio was fixed to 80 percent. To ease the liquidity in financial system during Covid-19, NRB relaxed the ratio to 85 percent from existing limit of 80 percent up to mid July 2021. This is so useful to prevent overheating of an economy due to excessive credit flow from Banks and financial institution. The diagram showing that there was credit crunch in first few months of lock down. CCD is getting gradual upper momentum after easing the lock down with availability of vaccine against Covid-19. The increasing credit flow from Banks and Financial institution is bright signal for the recovery of economy. The question exist in between is the credit extended is natural or due to regulatory relaxation for additional credit extension to cooperate business in pandemic situation.

<Figure 4-1> CCD ratio (%)

Source: NRB, 2021

(3) Deposit Guarantee

In order to provide assurance of deposits of public NRB introduced the provision of Deposit Guarantee since 2010/11. When the scheme was announced, its limit was NPR 200,000. At present, BFIs have to guarantee deposit of natural person up to NPR 500,000.

(4) Single obligor limit

This tool is in application since 1998/99. This is relevant to avoid excessive concentration of credit flow to single person or group. Initially when provision was introduced, the limit for single entity was 50 percent of capital funds for funded loan and 100 percent of capital funds for non-funded. January 2011, SOL for both funded and non-funded has been set to 25 percent of core capital. The limit can go up to 30 percent for productive industries and 50 percent for construction projects relating to hydropower, electricity transmission line and cable car. The revision in limit in different year since its inception is given in the chart.

<Figure 4-2> Single Obligor Limit

(5) Sectoral Credit Limit

This tool is useful to avoid concentration risk in financial system by preventing excessive credit flow to particular sector. It was introduced in Nepal by NRB since

1998/99.

(6) Loan against shares

NRB Issued directives to provide margin nature loan in FY 2005/06.As of circular issued in July 2020, the minimum margin requirement on securities lending applies 70 percent of 120 days average closing price or 70 percent of the market price, and whichever is lower.

Amidst Covid-19, the stock market index is historically high. The Credit flow of banks and financial institution to margin loan is also rising significantly.

(7) Loan to value (LTV ratio)

It is introduced in 2009/10 for lending against collateral of land and housing. According to recent directives related to real estate, credit disbursement shouldn't exceed 40 percent of fair market value inside Kathmandu valley and 50 percent out of Kathmandu valley of the housing and real estate assets. Limit can extend up to 60 percent for personal residential home loan and authorized housing companies from government of Nepal. LTV for first time home buyer amounting NPR 15 million can go up to 70 percent.

(8) Limit on deposit concentration

It has been enacted since 2009/10. As per recent provision, deposits from single firm, company or organized entities must not exceed 10 percent Deposits of concerned BFIs. Institutional deposits should not exceed 50 percent of total deposits of concerned BFIs.

(9) Debt-service-to-income-ratio

It was introduced from December 2019 for individual borrowers for installment-based loans. The maximum DTI allowed is 50 percent and is calculated based on the ratio of

debt to total income of the individual. This would control over credit flow to individual beyond their repayment capacity.

B. Macroprudential tool kits used by NRB after Covid19

- Defer in implementation of provision to raise Countercyclical: On August 2019, commercial banks were said to maintain countercyclical buffer of which vary between 0 to 2.5 percent of total risk weighted exposure by the end of FY 2019/20. This provision as per the capital adequacy Framework 2015 is pulled out to support BFIs from adverse impact of Covid-19.

- Relaxed CCD ratio: The CCD ratio is relaxed from 80 percent to 85 percent. The motive behind is to ensure availability additional liquidity in the financial system.

- Margin Lending: There was revision in valuation criteria of stock while providing margin loan from average price of 120 days into 180 days. This revision in provision will check the excessive credit flow in stock market which is growing unnaturally even during Covid pandemic.

- Revision in reserve requirement: From March 2020, cash reserve ratio (CRR) is lowered to 3 percent from 4 percent. This revision support for availability of additional liquidity to BFIs for credit flow.

- Easing in Loan classification: The lock down executed by government of Nepal to control the spread of Covid virus has created tough situation for movement, run offices and maintain cash flow of the business. NRB gave relaxation in loan classification for BFIs into watch list for failure to renew loan due to pandemic.

- Allowing interest recapitalization: Covid brought severe pain in business community by distracting to run their business. Majority of firms are shut down for several months. To ease the business for short term, interest capitalization was allowed.

C. Macroprudential Issues in Nepal

- Strengthen Macroprudential authority: NRB has clear mandate for regulation of BFIs given by NRB Act, 2002. Both NRB Act and Bank and Financial Institution Act has given adequate power to NRB. It has been using several macro prudential tools to ensure financial resilience. The recent development in financial system has invited several threats to financial system. It urges to develop capacity within NRB to subdue the possible challenges.

- Develop mechanism to identify SIFIs: The banking consolidation has brought different type of challenge due to their increased size. The non-banks financial institution is also growing significantly. It is paramount to have clear mechanism to identify SIFIs.

- Diagnosing systematic risk: In todays globalized world financial institutions are largely interconnected. The contagion from one unit or sector may easily invade the next unit or sector. It is challenging to NRB to diagnose systematic risk due to interconnectedness of financial institutions.

- Collateral based lending: The lending practice in Nepal is largely rely on collateral. Any bad consequence on asset price will have adverse impact on overall financial system. It is challenging for NRB to diversify the security against which credit is granted by BFIs to household or entrepreneurs.

- Informal economy: It is estimated that large part of economy is informal in Nepal. It is challenging to diagnose the issues on that part of the economy but it has significant impact on the soundness of the financial sector.

- Level of NPL and loan ever greening: The level of NPL in Nepal is relatively low comparing with most of countries in south Asia. Though data of NPL looks well enough but it is always a challenge for NRB is this a real fact or there exist mal practice from BFIs for ever greening the loan.

- Foreign currency and BOP issues: Nepal's foreign currency requirement is

largely finance by the remittance. Any adverse incident in host countries has serious impact in foreign currency reserve of Nepal. Similarly, balance of payment situation of Nepal is largely volatile and unpredictable.

- Availability of adequate data: Since, Nepal is developing country and gradually moving towards the upper rung of financial development. Large no of financial transactions is not recorded formally. There is always lack of necessary and quality data for evaluation of effectiveness of any policy measures.

- Strengthening financial stability oversight committee: There is financial stability oversight committee headed by senior deputy governor. It lacks transparency since records of the meeting are not published for the public.

- Recurring liquidity issues: Nepalese financial system goes through liquidity issues frequently. This creates volatility in interest rate.

- Effective communication of policies: Large segment of population in Nepal is not sufficiently aware about financial affairs. It is challenge for NRB to communicate its policies to public so as to gain their support and confidence.

D. Post Covid19 macroprudential policy measure

- Lifting up regulatory/supervisory relaxation: The regulatory and supervisory relaxation can't go perpetual. It is necessary to lift them up once economy move towards the recovery. This is essential for maintaining long term financial resilience.

- Adopting new macro prudential tools: The changing global financial structure is demanding newer prudential tools such as net stable funding ratio or liquidity coverage ratio. NRB should move towards those measures to ensure financial stability of Nepal.

- Channeling credit flow towards productive sector: Though credit growth is encouraging but it's a critical challenge for channeling resources towards the productive sector. NRB should focus directed lending to flow in prescribed

sectors.

- Recognition of NPL and provisioning: Nepalese BFIs are accused of underestimating NPL. NRB focus will be to recognize the NPL and ensure sufficient provisioning to ensure better financial health of BFIs.

- Ensuring sufficient liquidity for credit creation: NRB is aware about importance of availability of sufficient liquidity within financial system. It will adopt adequate measure to overcome credit crunch using several tools to guarantee the sufficient liquidity in the system.

2. Long term macroprudential policy agenda after Covid19 in Nepal

A. Current state for macroprudential policy

(1) Monetary sector development

To give a boost to the real economy, the Nepal Rastra Bank (NRB) lowered the policy rates and took supplementary economic measures. Since the fiscal year 2017 (FY17), the central bank has been using an interest rate corridor (IRC) to deal with the volatility in short-term interest rates (weighted average interbank rate). In FY21, the lower bounds of both the IRC and the policy rate were adjusted. They were lowered by 1 percentage point (to 1 percent) and 0.5 percentage point (to 3 percent), respectively, to achieve the primary goal of enhancing liquidity (Figure 4-3). The NRB also implemented additional credit relief measures to provide support for the struggling private sector. Major actions included (i) refinancing programs for firms affected by Covid-19; (ii) concessional lending to the agricultural sector; (iii) the requirement that at least 15 percent of credit from commercial banks should be allocated to the agriculture sector by FY23; and (iv) more directed lending to micro as well as small and medium-sized businesses by FY24.

<Figure 4-3> Policy rates in Nepal

(percentage, weighted average)

Interbank Rate   Upper Bound-IRC Lower Bound-IRC Policy Repo Rate
Interbank Rate-India

Source: NRB and World Bank staff calculations

<Figure 4-4> M2 growth in Nepal

(contribution to M2 growth, percentage points)

M2 M2 Target   Claims on others   Claims on private sector
                 Net claims on government Net foreign assets

Source: NRB and World Bank staff calculations

However, M2 growth remained below the FY21 monetary policy target regardless of the central bank's accommodative stance. In <Figure 4-4> , M2 grew just by 9.60 percent in the first two quarters of FY21, which is below the annual FY21 target (18 percent) and said to reflect the shrinking economic activity. The staggering growth of money supply took place even after taking into account an increase in foreign exchange reserves and

government deposits, which contributed to M2 growth via lower negative net claims on the government and higher net foreign assets.

(2) Financial sector development

In FY20, private sector credit growth recorded 12.4 percent, which is a slowdown compared to 19.3 percent in FY19. The result mainly owes to a joint effect of weak demand on the borrowing side and risk aversion on the lending side in the second half of the fiscal year. The net issuance of private sector loans plummeted by 57.5 percent year-on-year between mid-March and mid-July 2020, which contributed to especially steep decline during the lockdown. The decline also showed sectoral variation. Although credit growth in some sectors − such as agriculture and retail − remained relatively robust in the midst of pandemic, credit to industries that were directly hit by the pandemic − such as construction, import businesses, tourism − diminished sharply. However, due to a rise in precautionary savings along with the deferment of tax payments, the growth rate of deposits recorded 18.6 percent in FY20.

<Figure 4-5> Private credit growth in Nepal

(contribution to private sector growth, percentage points)

Private Credit   Agriculture Construction Industry Others Services

Notes: Data are for the months from January through June of each fiscal year (FY).

Source: NRB and World Bank staff calculations

Private credit growth has recorded 11.6 percent (year-over-year) in the first two quarters of FY21, recovering from a contraction in the second half of FY20. The recovery in credit that has been observed recently is in line with the gradual restoration of economic activity, which owes to the weaker mobility restrictions. In addition to the relaxation of movement restrictions, the effects of credit relief measures also added to the recovery in credit growth (Figure 4-5). However, analyzing the composition of credit growth suggests that much of it has been attributable to overdrafts[10] by businesses who were adversely impacted during the pandemic and tends to be the beneficiaries of the economic relief measures. Furthermore, the composition suggests that much of the credit growth was for margin lending for stock market investments[11] (Figure 4-6).

<Figure 4-6> Private credit used for overdraft and margin lending

(contribution to private sector growth, percentage points)

Notes: Data are for the months from January through June of each fiscal year (FY).
Source: NRB and World Bank staff calculations

The fact that the stock market reached its a historic peak in January 2021, propped up

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[10] On December 1, 2020, the NRB issued a circular to Banking and Financial Institutions that would require them to lower the individual overdraft loan to NPR 5 million. Borrowers do not have to state the purpose of loan when the overdraft loan is provided.

[11] Margin lending is provided against the collateral of stocks and bonds.

by reduced borrowing costs and excess liquidity in the market in the midst of dampening investment demand and higher risk aversion from lenders, attests to this viewpoint (Figure 4-7).

<Figure 4-7> Credit conditions in Nepal

Source: Nepal Stock Exchange, NRB, and World Bank staff calculations

In the first half of FY21, deposits further increased by 9.2 percent, bouncing back from the decreasing trend in the previous fiscal year (Figure 4-8). The growth of deposits in the first half of FY21 was primarily driven by individual deposits. The robust expansion of deposits is on account of three key factors: (i) increase in official remittances, (ii) higher precautionary savings by households[12], and (iii) a temporary and coerced increase in savings by high-income households[13].

The prudential indicators in the banking sector stayed generally within the regulatory boundaries in the first half of FY21. The NRB implemented several measures to increase

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[12] The rise in precautionary saving is known to reflect consumers' strategic effort to deal with heightened uncertainty about future economic prospects

[13] These consumers were forced to halt their consumption of high-value economic services such as international travel and restaurant meals.

<Figure 4-8> Deposits in Nepal

(percentage points)

Source: Nepal Stock Exchange, NRB, and World Bank staff calculations

the volume of loanable funds in the first half of FY21. Such measures included (i) an increase in the Credit-to-Core Capital and Deposit (CCD) ratio to 85 percent (from 80 percent); (ii) an increase in the existing refinancing fund by up to five times; and (iii) the suspension of the countercyclical capital buffer requirement. As a result, the loanable funds has become more available even though credit uptake remains low. In turn, banking sector indicators were sound and robust in that they did not breach the regulatory standards. For instance, the ratio of net liquid assets to total deposits recorded 26.8 percent, staying above the requirement of 20 percent. The CCD ratio remained below the regulatory limit (85 percent) as well, at 74.9 percent. Furthermore, banking and financial Institutions (BFIs) kept themselves well capitalized, with sound asset quality. The nonperforming loans to total loans, which is defined as the ratio of loans that are overdue over 90 days (three months) or more to total loans, was in the low single digits (2 percent), and the capital adequacy ratio was above the regulatory threshold of 11 percent.

(3) Business sector development

<Table 4-1> shows the distribution of formal and informal employment across formal and informal sector in Nepal. About 60 percent of the formal sector workforce are employed without proper formal contracts, which implies that such workers lack job and social security schemes in Nepal. Cumulatively, about 85 percent of the total working population are related to informal occupations. This means that they are susceptible to risks associated with the informal economy.

<Table 4-1> Distribution of formal and informal employment across each sector in Nepal

(Unit: %)

Occupation	Formal	Informal	Total
Formal Sector	40.86	59.18	100
Informal Sector	0	100	100
Total	15.42	84.59	100

Source: NLFS 2017/18

As informal sectors typically remain beyond governmental regulations, oversight and control, it is nigh impossible for them to receive protections and provisions that are designed for devastating circumstances like the global pandemic.

<Table 4-2> Micro, small, and medium enterprises (MSMEs) in Nepal

(Unit: %)

Enterprises	Total	Registered	Unregistered	Employment Share
Micro	95.40	47.90	52.10	58.80
Small	4.20	94.70	5.30	21.30
Medium	0.24	96.10	3.90	4.60
Large	0.19	97.50	2.50	15.30

Source: The National Economic Census, 2018

<Table 4-2> presents the status of enterprises by size in Nepal, which is sourced from the National Economic Census in 2018. According to the census, micro as well as small and medium enterprises (MSMEs) constitute most of businesses (99.81 percent) in Nepal. Chief among them, microenterprises, which are defined as the businesses with up to nine employees, solely represent approximately 95 percent. However, almost 50 percent of the total enterprises are informally active and not officially registered. A large share of informal employment mainly owes to micro-enterprises. More than half of (52 percent) of microenterprises remain outside the governmental purview, generating a composition heavily leaning toward informal economy. In contrast 94.7 percent, 96.10 percent and 97.50 percent of small, medium and large enterprises respectively are formally registered.

In terms of employment share, Micro-enterprises are the major source of employment in that it takes up around 60 percent of the total workforce for the country. MSMEs is dominant Nepal's economic landscape in that they generate more than three-quarters of Nepal's formal jobs. <Figure 4-9> presents the compositions In tourism, according to Nepal Economic Census (2018), 94 percent of formal establishments under accommodation and food services are micro-enterprises and five percent are small enterprises, while less than one percent are medium and large enterprises.

<Figure 4-9> Share of enterprises by scale in tourism industry

Source: Nepal Labour Force Survey(2018)

Micro and small enterprises share a commonality of having a low cash-to asset ratio. This means that they depend highly on their own business for survival. For such firms, the outbreak of Covid-19 was devastating in that it resulted in a complete halt of cash-flow which is critical for the survival of micro- and small businesses in this industry.

<Table 4-3> Distribution of survey sample by province and ecological regions

Provinces	Mountain		Hill		Terai		Total	
	N	%	N	%	N	%	N	%
Province 1	25	21.4	50	13.7	25	11.5	100	14.3
Province 2	0	0	0	0	101	46.5	101	14.4
Bagmati Province	25	21.4	150	41	25	11.5	200	28.6
Gandaki Province	26	22.2	75	20.5	0	0	101	14.4
Province 5	0	0	49	13.4	49	22.6	98	14
Karnali Province	24	20.5	26	7.1	0	0	50	7.1
Sudurpashchim Province	17	14.5	16	4.4	17	7.8	50	7.1
Total	117	100	366	100	217	100	700	100

Source: UNDP (2020)

In such dire circumstance, micro- and small enterprises are likely to resort to informal money lenders and fall prey to usury since they typically have poor access to finance. What makes matters worse for such borrowers is that the governmental provision such as the moratoria targeted at the principal and interest payment by the central bank do not apply. In other words, they not only have to pay their fixed costs of rent and salaries but must also service debt when they strive to make ends meet.

<Table 4-4> Proportion of type of business by province and registration status(percent)

Industries	Province 1	Province 2	Bagmati	Gandaki	Province 5	Kar-nali	Sudur-pashchim	Total	Registered Enterprises
Agriculture	8	9.9	12.5	3	19.4	16	10	11.1	61.5
Dairy & Livestock	1	8.9	4.5	4	10.2	0	10	5.4	86.8
Trade	61	55.4	55.5	58.4	37.8	50	50	53.4	82.6
Accomodation & Food	15	8.9	11	28.7	6.1	16	6	13.1	81.5
Manufacturing	1	1	2.5	0	7.1	6	0	2.4	88.2
Repairs & Maintenance	2	1	3.5	3	7.1	0	8	3.4	79.2
Transportation	1	1	2	1	4.1	4	2	2	85.7
Others	11	13.9	8.5	2	8.2	8	14	9	87.3
Total	100	100	100	100	100	100	100	100	

Source: UNDP (2020)

To assess the socio-economic impact of the global pandemic on informal businesses in Nepal, a study team at United Nations Development Programme (UNDP) carried out a survey of 700 businesses using a structured questionnaire in April 2020. The questionnaire covered types of businesses, start-up capital, volume of transactions, impact of lockdown, coping mechanisms and expected assistance from the government. The surveyed sample covers businesses from all provinces and ecological regions in the country. <Table 4-3> shows the break-down of the sample.

<Table 4-5> Summary of impact of lockdown on businesses

Industries	Averag start up capital (In NPR)	Average number of paid workers	Average Number of paid workers during lockdown	Average days of business operation in a month	Average days of business operation in a month during lockdown
Agriculture	524,487	1	1	29	17
Dairy & Livestock	1,810,132	2	1	29	16
Trade	813,623	1	0	28	4
Accommodation & Food	1,181,630	3	2	30	1
Manufacturing	1,440,882	3	1	27	4
Repairs & maintenance	770,833	3	1	28	0
Transportation	1,113,571	3	1	29	1
Others	1,865,556	5	2	27	5

Source: UNDP (2020)

<Table 4-4> presents the composition of types of business by province and registration status. Trade ranked first (53.4 percent) across all provinces and business sectors. It was then followed by food and accommodation (13.1 percent); agriculture (11.1 percent); and daily and livestock (5.4 percent).

<Table 4-5> and <Table 4-6> outline the impact of lockdown on businesses. With an exception of agriculture, approximately 80 percent of businesses in the sample were registered and owned start-up capital which ranges from NPR 0.5 million to NPR 1.8 million. The impact of COVID-19 on small/informal business is quantified in terms of i) changes in the number of paid workers, ii) number of days operated, and iii) changes in their monthly revenue. On account of the lockdown, businesses have shrunk down the number of paid workers by an average of between 50 percent and 60 percent. These businesses previously employed an average of one to five workers.

<Table 4-6> Summary of impact of lockdown on businesses

Industries	Average monthly revenue before lockdown	Average monthly revenue during lockdown	Length of sustainability if lockdown were to continue
Agriculture	139,897	18,756	3.5
Dairy and Livestock	199,474	73,211	1.7
Trade	296,759	24,567	1.7
Accommodation and Food	242,446	2,315	1.5
Manufacturing	508,529	11,765	1.5
Repairs & maintenance	239,083	833	1.8
Transportation	213,786	5,357	1.8
Others	381,143	37,651	1.8

Source: UNDP (2020)

The lockdown has also had adverse effect on the days of operation. The number of working days prior to the lockdown was about 29 to 30 on average. But the lockdown has resulted in a decrease in the number of operating days to between one and seventeen. The heavily impacted businesses were concentrated in the food and accommodation; trade; and repair and maintenance sectors. Businesses are also experiencing the negative impact in terms of reduced revenue (Table 4-6). Prior to the lockdown, monthly sales revenue ranged from NPR 100,000 to NPR 500,000. During lockdown, the range of monthly sales revenue was drastically reduced to the level between NPR 833 to around NPR 73,000. Manufacturing; repair and maintenance; transportation; and food and accommodation sectors have faced steep falls in monthly revenue. While dairy and livestock are still earning relatively higher revenues compared to other sectors, the income have also decreased drastically from NPR 1.9 million to NPR 73,000. Under the scenario of continued lockdown, these small businesses were reported to sustain themselves only for 1.5 to 3.5 months. The major channels through which the impact of lockdown was transmitted are known as the lack of raw materials, reduction of sales, and lack of access to transportation.

<Table 4-7> Percentage of enterprises to survey questions related to lockdown and support

Industries	Enterprises who presume their inability to cope up from the lockdown	Enterprises who have not received support
Agriculture	61.5	96.2
Dairy and Livestock	84.2	100
Trade	79.7	100
Accommodation and Food	84.8	98.9
Manufacturing	94.1	100
Repairs & maintenance	66.7	100
Transportation	71.4	100
Others	66.7	100
Total	77.1	99.4

Source: UNDP (2020)

When asked if businesses can cope with the shock of the lockdown on their own, 77 percent answered no (Table 4-7). The response was higher for accommodation and food (84.8 percent); dairy and livestock (84.2 percent); and manufacturing (94.1 percent). This indicates these business need combinations of external assistance and changes in strategy.

According to the survey, 99.4 percent of businesses are yet to receive external support to cope with the lockdown.

The choice of strategies in light of the global pandemic, such as laying off workers, cutting operating cost, loans, and closure of businesses varied across sectors. For instance, agriculture was in favor of cutting operating costs, while dairy and livestock chose laying off workers. Trade preferred cutting operating costs and closure of business, and accommodation and food preferred closure of business (Table 4-8).

\<Table 4-8\> Choice of strategy to cope up from the economic shock

Industries	Cut operating cost		Lay off workers		Paycuts to staff		Borrow		Close the business		Others		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Agriculture	71	13.4	14	11.1	12	12.5	32	12.5	7	6.2	1	16.7	78	11.1
Dairy & Livestock	28	5.3	10	7.9	7	7.3	16	6.2	6	5.3	1	16.7	38	5.4
Trade	287	54	52	41.3	40	41.7	145	56.4	61	54	0	0	374	53.4
Accommodation and Food	55	10.4	19	15.1	9	9.4	28	10.9	24	21.2	2	33.3	92	13.1
Manufacturing	11	2.1	3	2.4	9	9.4	4	1.6	3	2.7	0	0	17	2.4
Repairs & maintenance	21	4	8	6.3	4	4.2	7	2.7	1	0.9	0	0	24	3.4
Transportation	10	1.9	3	2.4	4	4.2	4	1.6	4	3.5	0	0	14	2
Others	48	9	17	13.5	11	11.5	21	8.2	7	6.2	2	33.3	63	9
Total	531	100	126	100	96	100	257	100	113	100	6	100	700	100

Source: UNDP (2020)

\<Table 4-9\> Support needed to sustain during and after lockdown (rated by respondents)

Particulars	First rating		Second rating		Third rating	
	N	%	N	%	N	%
Cash subsidy	277	39.6	71	11.1	73	15.8
Subsidy on utility payments	17	2.4	82	12.8	51	11
Concessional loans	130	18.6	237	37.1	124	26.8
Interest rate subsidy	170	24.3	180	28.2	133	28.7
Rental waiver by landlord	100	14.3	60	9.4	75	16.2
Ohters	6	0.9	9	1.4	7	1.5
Total	700	100	639	100	463	100

Source: UNDP (2020)

These businesses were also asked about the type of support they want to alleviate the damage and maintain their businesses during and after lockdown (Table 4-9). Government cash subsidies was considered the most important kind of support, followed by interest rate subsidies, concessional loans, and rental waivers by landlords. Subsidies

on utility payments was considered the least important form of support needed by small/informal businesses.

It might not be practical at this point to provide cash subsidies, but support to these businesses in terms of concessional loan/soft loan, interest rate subsidy, and rental waivers will likely help mitigate the impact of the pandemic.

B. Long term macroprudential policy after Covid19

(1) Overview for macroprudential policy instruments

Since the global financial crisis of 2008, macroprudential policy has captivated much attention from policymakers as one of the primary macroeconomic policy instruments for sustainable economic growth. In the era of a Covid-19 crisis all over the world, macroprudential policy is now attracting much more attention. The final goal of macroprudential policy is to avoid financial instabilities or vulnerabilities, including banking crises, which have a durable and detrimental effect on the economy. Thus, a considerable amount of studies has investigated how macroprudential policy affects macroeconomic and financial variables such as output, credit, and deposit.

<Figure 4-10> shows the use of macroprudential policy instruments in advanced and emerging market economies. Most countries tend to use changes in reserve requirements as a primary macroprudential policy tool. The other instruments for macroprudential policy include capital-based instruments, such as countercyclical capital requirements and leverage restrictions, and liquidity-based requirements.[14] For the type of macroprudential policy measures, tightening measures were more frequently used (62 percent) compared to loosening measures (38 percent). The far-right graph indicates that in advanced economies, cyclical macroprudential tools were used more than macroprudential tools for resilience (14 percent vs. 9 percent). In emerging market economies, cyclical

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[14] Also, they include asset-side instruments including credit growth limits; and currency instruments such as variations in limits on FX mismatches and net open positions.

macroprudential tools were used much more (about 3 times) compared to macroprudential tools for resilience (59 percent vs. 18 percent).

<Figure 4-10> Use of macroprudential instruments in advanced and emerging market economies

(unit: %)

¹ The sample covers the period 1990–2014. Macroprudential tools for resilience include (a) capital-based instruments (countercyclical capital requirements, leverage restrictions, general or dynamic provisioning) and (b) liquidity requirements. Cyclical macroprudential tools include (c) asset-side instruments (credit growth limits, maximum debt service-to-income ratio, limits to banks' exposures to the housing sector as a maximum loan-to-value ratio); (d) changes in reserve requirements; and (e) currency instruments (variations in limits on foreign currency exchange mismatches and net open positions).

Source: BIS

Overall, about 60 percent of macroprudential policy instruments across advanced and emerging market economies tend to be used to tighten financial conditions. Among all the macroprudential policy measures used, while 77 percent were taken by emerging market economies, 23 percent were taken by advanced economies.

First, in line with recent developments in the issues of financial stability along with macroprudential policy, we investigate how the implementation of macroprudential policy in Nepal affect real GDP, the credit-to-GDP ratio, as well as FX reserves while controlling for some Nepal-specific factors such as real remittance and tourist visitors. We also include real GDP for Saudi Arabia and India as exogenous variables. Second, using bank-level panel data of NPLs, we attempt to quantify how sensitively the NPL ratio responds to changes in macroeconomic and financial conditions in Nepal.

(2) Effects of non-performing loans (NPLs) on the Nepal's economy in the long term

A significant increase in NPLs can lead to systemic risk when it has a substantial effect on the Nepal's financial system, which in turn, threatens its stabilities and causes vulnerabilities. Therefore, when implementing macroprudential policy, an increase in NPLs should be seriously taken into account. Owing to lack of data availability on measures or instruments for macroprudential policy in Nepal, we attempt to analyze how changes in NPLs affect macroeconomic and financial variables in Nepal using quarterly data for the period Q1 2011 through Q3 2020.

To quantify the effects of NPLs on the Nepal's economy in the long run, we employ the vector autoregressive regression (VAR) framework as follows:

$$y_t = \alpha + \sum_{j=1}^{p} B_j y_{t-j} + \varepsilon_t$$

where the vector y_t includes real GDP (in log), real credit which is provided by private banks, real deposit (in log), stock market (NEPSE) return, total NPLs (which is an important measure for macroprudential policy in Nepal); the policy interest rate which is a measure for monetary policy and α is a vector of intercepts; B is a matrix and C denotes a vector which includes coefficients to be estimated in the system; and ε_t is a white noise vector of errors with mean zero.

This specification enables us to capture the link between real and financial variables for the Nepal's economy.

<Figure 4-11> depicts macroeconomic and financial variables for Nepal. More specifically, the variables include real GDP (in millions, seasonally adjusted, NPR), real credit, real deposit, the policy interest rate (in percent), and the Nepal stock exchange (NEPSE) index. For real GDP, real credit, and real deposit, there is an upward trend over time. However, real GDP decreased by about 2% in 2020 compared to 2019 due to the outbreak of COVID-19. The policy interest rate has decreased since late 2014 and was at the 5 percent level in 2020. While the Nepal stock exchange (NEPSE) index has increased

until 2017, it has declined from 2017 to 2020. Due to the outbreak of COVID-19, the index fell, but recovered shortly. Using these data, we attempt to quantify and analyze the effect of total NPLs on macroeconomic and financial variables.

<Figure 4-11> Macroeconomic and financial variables for Nepal

(a) Real GDP (in millions, NPR)

(b) Real credit (in millions, NPR)

(c) Real deposit (in millions, NPR)

(d) Policy interest rate (%)

(e) Nepal stock exchange (NEPSE) index

Source: Nepal Rastra Bank

<Figure 4-12> shows total non-performing loans (NPLs) which are aggregates for Class A banks from Q1 2011 to Q3 2020 for Nepal. Total NPLs declined recently by about 6% in Q3 2020 due to the effects of relief measures. They have gradually increased over time since Q1 2011 starting from the value exceeding 20000 million. More recently, the NPL ratio (over total loans) has been below 2 percent.

<Figure 4-12> Total non-performing loans (NPLs)
(Aggregate for Class A banks) for Nepal

Note: Total NPLs are in millions and NPR.
Source: Nepal Rastra Bank

We use standard Cholesky decompositions to identify orthogonal shocks using the ordering of the endogenous macroeconomic variables: the log of real GDP, the log of real credit, the log of real deposit, stock market (NEPSE) return, total NPLs, and the policy interest rate. The policy interest rate is included as the instrument for monetary policy. Likewise, since total NPLs should be considered when implementing macroprudential policy, they are also included in the VAR framework. The lag order for the VAR model is determined as four based on the Bayesian information criterion (BIC). Having decided

the ordering of the variables and the lag order in the system, the VAR model is estimated using OLS. Next, the impulse response functions (IRFs) is generated to depict the macro-financial linkages between macroeconomic and financial variables employed in the system. Using the estimated IRFs, we are able to quantify the direct effects of changes in NPLs on the Nepal's economy in the short and long terms.

<Figure 4-13> Impulse responses to total NPLs shocks
: VAR fit to quarterly Nepal data, with 90 percent confidence bands

Notes: The graphs show impulse response functions of the log of real credit, the log of real deposit, the log of real GDP, the policy interest rate, and stock market (NEPSE) return to total NPLs shocks. The grey area indicates 90 percent confidence intervals.

<Figure 4-13> displays the impulse response functions of macroeconomic and financial variables to one standard deviation shock to total NPLs, with 90 percent confidence bands. The shock leads to a statistically significant fall on real credit by about 0.02 percent (annualized) at the 10 percent significance level after three quarters. Until six quarters, it declines by about 0.032 percent (annualized) and starts to rise in the long run. However,

the impact remains statistically insignificant in the long term. After 20 quarters (or 5 years), it increases by about 0.01 percent (annualized). This is consistent with the earlier findings that a rise in total NPLs reduces real credit with some lags in general. Real deposit also exhibits a similar pattern to real credit. The shock leads to an immediate and significant fall on real deposit by about 0.012 percent (annualized) at the 10 percent significance level with a lag of one quarter. After that, it starts to rise as the horizon gets larger until 10 quarters. However, after 10 quarters, real deposit fluctuates and ends up with a 0.01 percent decrease (annualized) in the long term. However, like the case for real credit, the effect remains statistically insignificant in the long term. It is worth noting that a fall in real credit is greater than that in real deposit (0.032 vs. 0.012 percent, annualized). It implies that an increase in total NPLs results in a greater fall in real credit with some time lags.

There appears to be a slightly positive impact on real output in the short and medium terms. After five quarters, real GDP rises by about 0.024 percent (annualized) and starts to fall and reaches -0.032 percent (annualized) until eight quarters. After that, it exhibits a statistically significant rise until the end of the horizon. Real GDP tends to increase to total NPLs shocks in the long term but it is not statistically significant. The policy interest rate tends to rise immediately in response to a rise in total NPLs in the short term. This means that tightening monetary policy has been implemented in accordance with tightening macroprudential policy. It is known that both monetary and macroprudential policy actions generally have the same direction. As time goes, the stance for monetary policy turns into loosening about one year later. Lastly, the stock market (NEPSE) index falls shortly to total NPLs shocks by 4 percent after about a quarter. However, at quarter two, it increases by 4 percent and starts to fall. It fluctuates until the end of the horizon.

Overall, we can summarize how shocks to total NPLs in Nepal affect macroeconomic and financial variables in the short and medium terms as well as long term as follows. While the real credit and real deposit tend to fall in the short term, they exhibit a different pattern in the long term. In addition, a fall in real credit is greater than that in real deposit in the short term. There is a slightly positive impact on real GDP in the short and medium

terms. However, it tends to rise in response to total NPLs shocks in the long term. The policy interest rate tends to rise immediately in the short term, implying tightening monetary policy, but turns into loosening after about two quarters. The stock market (NEPSE) index falls shortly to total NPLs shocks by 4 percent after a quarter, but recovers shortly within about a quarter. This implies that the stock market in Nepal has not been much influenced by COVID-19.

Furthermore, using bank-level panel data of NPLs, we quantify how sensitively the NPL ratio responds to changes in macroeconomic and financial conditions. In particular, the logistic transformation is applied to the NPL ratio for bank i at time t, as denoted by y_{it}.[15]

$$y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{k=1}^{n} \beta_{i,k} x_{t-k} + \sum_{k=1}^{n} \delta_{i,k} z_{i,t-k} + d_i g_t + u_{it}$$

Where the dependent variable, y_{it}, is the logistic transformation of the NPL ratio, x_t includes the endogenous variables and $z_{i,t}$ denotes the bank-related variables such as a loan portion for specific sectors. g_t denotes unobserved common factor and u_{it} is the idiosyncratic error which is independent across banks. The error is also assumed to be serially uncorrelated..

However, the simple pooled OLS estimation is known to suffer from a series of some econometric issues: parameter heterogeneity across banks, omitted variable bias, and cross-sectional dependence (CSD). To control for parameter heterogeneity and CSD among banks, following Pesaran (2006), we adopt the common correlated effects mean group (CCEMG) estimator. The estimator is capable of accounting for parameter heterogeneity and CSD reasonably well.

The lagged term of the dependent variable ($y_{i,t-1}$) is included to capture temporal persistence. The explanatory variables included are GDP growth, the lagged detrended ratio of aggregate credit to GDP, the lagged detrended ratio of aggregate credit to deposit,

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[15] The logistic transformation is implemented for the NPL ratio as follows: $y_{it} = \ln[n_{it} \; / \; (1 - n_{it})]$, where n_{it} denotes the NPL ratio. This ensures normality of the error term.

and the portion of the estate loan which is the bank level variable. We use the quarterly data for the period Q1 2011 through Q3 2020, which include 27 individual banks of Class A in Nepal.

\<Table 4-10\>
Estimation results using the bank-level panel data of the NPL ratio
(The dependent variable is the logistic transformation of the NPL ratio.)

Variable	Coefficient	95% confidence interval
Lagged NPL ratio	0.5042*** (0.00)	[0.4030, 0.6054]
Detrended credit to GDP (lagged)	0.2161* (0.06)	[-0.0102, 0.4425]
Estate ratio	3.8861** (0.01)	[0.9370, 6.8352]
NPL ratio (CSA)	0.7602*** (0.00)	[0.4918, 1.0285]
Estate ratio (CSA)	-8.2798*** (0.00)	[-13.6830, -2.8766]
GDP growth	-0.3207 (0.17)	[-0.7731, 0.1317]
Detrended credit to deposit (lagged)	1.0750** (0.03)	[0.1297, 2.0203]
Constant	1.4943** (0.02)	[0.2872, 2.7014]
Number of observations	1,026	-
Wald test statistic (*p*-value)	127.20 (0.000)	-

Notes: The p-values are reported in parentheses. "CSA" denotes the cross section average of the corresponding variable which is included to control for the potential unobserved common factors. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

\<Table 4-10\> reports the estimation results using the bank-level panel data of the NPL ratio. The dependent variable is the logistic transformation of the NPL ratio. The estimated coefficient on the lagged (logistic transformation of) NPL ratio is 0.5, capturing

temporal persistence for the NPL ratio. The coefficient on the lagged detrended credit to GDP ratio is estimated to be positive and statistically significant at the 10 percent level. This implies that an increase in the credit to GDP ratio in the previous period leads worse asset quality. That is, as the level of credit increases, it tends to be associated with lower asset quality. The estimated coefficient on the estate ratio is also positive and statistically significant at the 5 percent level. It indicates that a higher portion of estate loan leads to a deterioration of asset quality. Next, the estimated coefficients on the cross section averages of the NPL ratio and estate ratio are statistically significant at the 1 percent level. It obviously provides strong evidence of the presence of the potential unobserved common factors.

The coefficient on the GDP growth rate is estimated to be negative, but statistically insignificant. Although the negative sign appears to be correct, we cannot draw a meaningful implication due to insignificance. Finally, the coefficient on the lagged detrended credit to deposit ratio is estimated to be positive and statistically significant at the 5 percent level. As the case of the lagged detrended credit to GDP ratio which we discussed above, it can be interpreted that a higher portion of credit compared to deposit leads to worse asset quality in the next quarter. It should also be noted that besides estate loan, we have also included the following variables as explanatory variables in bank panel data regressions: i) a portion of household loan, ii) a portion of residential home loan, and iii) a portion of major industrial sector loan. However, all of these variables turn out to be statistically insignificant. Therefore, we can conclude that among various loans that we have considered in the analysis, estate loan could contribute to a deterioration of asset quality.

In summary, an increase in credit or estate loan leads to a deterioration of asset quality in the next quarter. However, higher GDP growth tends to improve asset quality, but, unfortunately, this result turns out to be statistically insignificant. Through these bank panel data regressions, we have analyzed how changes in macro-financial conditions affect the NPL ratio which is important to retain financial stability in Nepal. Since the main goal of macroprudential policy is to avoid financial instability, which has a long-

lasting and detrimental effect on the Nepalese economy, it is necessary to focus on how to retain financial stability.

Thus, to avoid a deterioration of asset quality, which could bring about financial instability in the near future, the government authority needs to manage the levels of credit and estate loan well by implementing proper macroprudential policy and focus on how to operate macroprudential policy after COVID-19 in Nepal in the medium and long run. We can draw some policy implications after COVID-19 in Nepal as follows: Monitoring the levels of credit and estate loan appropriately could prevent potential financial instability in the Nepalese economy since an increase in credit and estate loan especially leads to a deterioration of asset quality, which in turn, could result in severe financial instability in the near future.

C. Early warning indicators (EWIs) of banking crises

(1) Recent developments on early warning indicators

In the past, an outstanding surge in both asset and credit prices tended to precede banking crises. Thus, it is important to provide an alarm for financial instabilities for banking systems. Household debt as well as international debt, which is in foreign currency or cross-border, could be a possible source of financial instabilities that could ultimately result in banking crises. Therefore, it appears to be crucial to assess the performance of household and international debts as early warning indicators (EWIs) for possible banking crises in the future. However, it is well noted that it is typically hard to detect the escalation of financial booms instantaneously and accurately. EWIs to detect banking crises are generally based on the idea that crises begin to sprout in disruptive financial cycles.[16] Previous studies have reported that such unsustainable booms could be identified quite well using deviations of asset prices and credit prices from trends in

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[16] That is, massive financial booms can give rise to the conditions for future banking crises.

the long run through certain critical thresholds.[17]

To detect the build-up of financial instabilities, in recent years the following series have been suggested as EWIs:

1. Credit-to-GDP gaps
2. Debt service ratios (DSRs)
3. Equity price gaps
4. Property price gaps

Depending on data availability for Nepal, specific subcategories of debt acting as a source of financial instabilities, especially household debt could be used as one of EWIs. Since elevated credit growth feeds into more elevated debt service in the near future, DSRs rise during credit booms. In addition, since DSRs take into consideration interest payments, they could work better compared to the credit growth or credit gap when debt increases continuously but slowly. As obviously evidenced by <Figure 4-14>, it is therefore anticipated that i) credit, ii) DSRs and iii) property price gaps are comparatively high before historically known crises.

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[17] These deviations of credit and asset prices from their long-run trends are also called "gaps".

<Figure 4-14> Evolution of BIS EWIs around past banking crises

Credit-to-GDP gap[2]	Total DSR[3]	Property price gap[4]

Median   ● ● ● 25th and 75th percentiles   ▪▪▪▪ Average outside crises

[1] The vertical line indicates time = 0. The historical dispersion (median, 25th and 75th percentiles) of the relevant variable is taken at the specific quarter across all crisis episodes available for the respective indicator. [2] Difference of the credit-to-GDP ratio from its long-run trend computed with a one-sided HP filter. [3] Difference of the total DSR from country-specific 20-year rolling averages. [4] Deviation of real property prices from their long-run trend computed with a one-sided HP filter.

Sources: IMF, *International Financial Statistics*; national data; BIS credit to the non-financial sector and property price statistics; authors' calculations.

For the similar reason, credit, DSRs and property price gaps work well as EWIs separately, and perform better in case where these indicators are jointly combined.[18] Higher household debt tends to increase consumption and output in the short run. However, it can also lower output in the long run. (see Mian et al (2017), Lombardi et al (2017), Zabai (2017)).[19] In <Figure 4-14>, while the credit-to-GDP gap and the total DSR tend to rise before crises (although the tendency to increase is much stronger for the total DSR compared to the credit-to-GDP gap), the property price gap tends to go down around crises.

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[18] See Borio and Lowe (2002), Drehmann et al. (2011), Drehmann and Juselius (2012), and Detken et al. (2014).

19 Excessive household debt is known to portent possible banking crises in the near future.

<Figure 4-15> Evolution of asset prices around past banking crises

Notes: Equity prices are in real terms; the gap is the deviation (%) from trend. The solid red line indicates the averag e across countries in the sample. The dotted blue and green lines denote the 10th and 90th percentiles, respectively. Sources: National data; BIS calculations.

<Figure 4-15> displays that the equity price gaps appear to decrease as crises approach. Furthermore, the equity price gaps hit the bottom around crises and start to rise after crises. There appears to be significant variation over time as evidenced by relatively large confidence bands. Overall, the credit-to-GDP gaps, debt service ratios (DSRs), property price gaps, equity price gaps could be used as EWIs to detect financial stabilities in the banking system. Many studies have shown the usefulness of such EWIs as they play a key role in providing timely and proper alarms with some precision in both advanced and developing economies.

As can be clearly seen in <Figure 4-16>, household debt could provide practical signals for the build-up of financial instabilities. First of all, the household sector DSR (left panel in the first row) has remained at the remarkably high level around past crises. Next, in the right panel (also in the first row), the household credit-to-GDP gap has remained above ordinary levels around past crises. For the two international debt indicators of the cross-border claims-to-GDP ratio and foreign currency debt-to-GDP ratio (bottom row), they appear to rise as crises approach. The cross-border claims-to-GDP ratio appears to be elevated in the pre-crisis period. Remarkably, the foreign currency debt-to-GDP ratio exhibits an increasing pattern robustly before banking crises.

<Figure 4-16> Evolution of new EWI variables around past banking crises

Household DSR[2]

Household credit-to-GDP gap[3]

Cross-border claims to GDP[4]

Foreign currency debt to GDP[5]

Quarters around crises

Quarters around crises

— Median   ▪ ▪ ▪ 25th and 75th percentile   ▪▪▪▪▪ Average outside crises

[1] The vertical line indicates time = 0. The historical dispersion (median, 25th and 75th percentiles) of the relevant variable is taken at the specific quarter across all crisis episodes available for the respective indicator. [2] Difference of the household DSR from country-specific 20-year rolling averages. [3] Difference of the household credit-to-GDP ratio from its long-run trend computed with a one-sided HP filter. [4] Twelve-quarter growth rate in the cross-border claims-to-GDP ratio. [5] Twelve-quarter growth rate in the foreign currency debt-to-GDP ratio.

Sources: IMF, *International Financial Statistics*; national data; BIS credit to the non-financial sector, debt securities, locational banking and property price statistics; authors' calculations.

(2) Evaluation of the performance of the EWIs

Next, we discuss how to formally evaluate the performance of the aforementioned EWIs. Policymakers should make a difficult decision on the critical threshold by taking into account the trade-off between missed crisis alerts (known as type I errors) and spurious signals (known as type II errors). Although there exist trade-offs, one possible way to evaluate how well EWIs perform is to take into account the entire mapping between type I errors and type II errors. However, selecting the critical threshold is somewhat complicated in the sense that it cannot be done accurately based on many previous studies. In general, it is associated with how many times the chosen critical threshold can detect actual past crises, which happened historically, in the corresponding

country.[20] As explained by Drehmann and Juselius (2014), for EWIs to provide a meaningful signal for policy, EWIs should have strong forecasting power and depend on solid information in real-time. Furthermore, they should meet three additional requirements: i) timing, ii) stability and iii) ease of interpretation.

As pointed out by Caruana (2010), providing the right timing signifies that EWIs' alarms should arrive in advance so that macroprudential policy instruments can be used properly and have a stabilizing impact on the economy.[21]

Choosing an EWI involves making a selection regarding the trade-off between the rate of precise forecasts and the rate of inaccurate signals. There are four possible combinations of a signal of "on" or "off" and ensuing event realizations of "happening" or "non-happening". The ideal indicator signals "on" in advance and only before all happenings; a less useful indicator would have an equal probability of being correct or wrong.

<Figure 4-17> Precise forecasts, inaccurate signals and the mapping between ROC curves and thresholds

UK credit-to-GDP gap relative to critical threshold[1]

ROC curves for the credit-to-GDP gap in the United Kingdom and all countries together[2]

[1] The horizontal line at value 9 indicates the critical threshold for the credit-to-GDP gap obtained in Table 2. The shaded periods indicate the 12 quarters prior to crises – the prediction horizon. The black circles indicate periods in which the credit-to-GDP gap exceeded the critical threshold yet no crisis materialised within the prediction horizon. The red circles indicate periods in which the credit-to-GDP gap exceeded the critical threshold during the prediction horizon. [2] The horizontal line indicates a crisis prediction rate of 66%. The black crosses show the points on the ROC curves with the optimal noise-to-signal ratios. The green dotted line is the steepest line from the origin that touches a corner point on the portion of the ROC curve that is at or above the 66% prediction rate, identifying the point with the lowest noise-to-signal ratios.

Sources: IMF, *International Financial Statistics*; national data; BIS credit to the non-financial sector statistics; authors' calculations.

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[20] There is possibility that the chosen critical threshold could also detect false crises, called "false alarms" as mentioned above.

[21] This also means that signals that arrive too early could be problematic.

<Figure 4-17> shows the case for the United Kingdom. It depicts the trade-off between precise forecasts (as a portion of all occurrences) and inaccurate signals (as a portion of all ordinary periods) when selecting an optimal threshold for the credit-to-GDP gap. The left panel shows how the credit-to-GDP gap for the UK evolves over time since 1980. The shaded areas denote the three years before the two crises occurred in 1991 and 2007, respectively.

The dashed horizontal line indicates the credit-to-GDP gap of 9 which is the critical threshold based on the analysis. For both pre-crisis periods, the gap exceeded the critical threshold of 9, so the prediction rate is 100% as in red circles. However, there are also false alarms detected as in black circles. Increasing the critical threshold above 9 tends to reduce the number of false alarms. However, as the critical threshold exceeds the value of 11.5, the crisis which occurred in 2007 is no longer detected, so that the prediction rate falls to a half. In contrast, lowering the critical threshold below 9 does not improve the prediction rate since it results in more false alarms.

The receiver operating characteristic (ROC) curve in the right panel provides this trade-off between precise forecasts and inaccurate signals for each threshold. For the United Kingdom, the prediction rate can be 100%, 50% and 0%, with false alarm rates decreasing as the critical threshold increases. The ROC curve, which is drawn for the credit-to-GDP gap is displayed by the solid red line. It is worth noting that it is a useful indicator. Ideally, a perfect indicator would have one threshold with a forecasting rate of 100% and an inaccurate signal rate of 0%. A fully unhelpful indicator would have the ROC curve with the equal rate of correct predictions and false alarms.

(3) Assessing current financial stabilities or vulnerabilities: the case for Nepal

We now discuss how to assess current financial stabilities or vulnerabilities. <Figure 4-18> provides the status of the various indicators in June 2017. The threshold for red cells minimizes spurious signals conditional on detecting at least two thirds (90%) of past crises with a cumulative 3-year forecasting horizon.

Those marked in amber equivalent to the lower threshold required to forecast at least 90% of the crises. This avoids a spurious signal and detects the gradual accumulation in financial stabilities or vulnerabilities. Asterisks denote a signal of the combined indicator at some point over the past three years.

There are some signals of high vulnerabilities for the household sector. In Korea, Russia and Thailand, the debt service ratio (DSR) for the household sector is in red. Property prices have also been raised in Sweden and Canada. It denotes an amber alert for DSR for the household sector. The indicator on cross-border claims provides the risk assessment for several countries and alarms some possible external vulnerabilities for other countries. Overall, it suggests that various EWIs could be used as a helpful starting point for a more granular evaluation of financial stabilities or vulnerabilities for both advanced and developing countries.

<Figure 4-18> Various EWIs for financial instabilities in the banking system

	Credit-to-GDP gap	Debt service ratio (DSR)	Household DSR	Cross-border claims to GDP
Australia	−8.1	1.0	1.0	21.3
Brazil	−6.4	−0.9	...	0.5
Canada	9.6*	2.9*	0.7*	33.1*
Central and eastern Europe[1]	−12.5	−1.9	...	11.4*
China	16.7	5.1	...	−27.9
Finland	−5.2	0.9	0.8	−22.4
France	4.0	1.6	0.5	2.7
Germany	−2.1	−1.6	−1.9	6.9
Hong Kong SAR	30.7*	6.9*	...	−12.3
India	−7.8	0.5	...	−30.6
Indonesia	6.9*	0.5*	...	−10.9
Italy	−18.0	−1.2	0.0	−10.8
Japan	7.6*	−1.8	−1.0	20.5*
Korea	−1.3	0.1	1.7	−13.9
Malaysia	4.0*	0.4*	...	−1.6
Mexico	6.2	1.1	...	17.9
Norway	−1.0	−0.3	1.1	34.4
Russia	−4.6	1.8	1.8	−24.9
South Africa	−2.2	0.0	−0.3	22.1
Spain	−50.7	−3.6	−1.6	−19.5
Sweden	−11.2	−0.4	1.1*	−1.9
Switzerland	10.0*	0.7*	...	7.5
Thailand	6.7*	−0.6	2.8*	−16.6
Turkey	5.4	6.1	...	−1.2
United Kingdom	−17.7	−1.3	−0.8	0.6
United States	−6.9	−1.1	−1.5	−15.2
Legend	Credit/GDP gap≥9	DSR≥1.8	DSR≥1.4	XB claims≥34
	4≤Credit/GDP gap<9	0.1≤DSR<1.8	0.6≤DSR<1.4	18≤XB claims<34

The threshold for red (amber) cells minimises false alarms conditional on capturing at least two thirds (90%) of historical crises with a cumulative three-year prediction horizon (see Table 2 and Tables A2–A6 in the Online Appendix). Asterisks highlight a signal of the combined indicator when property price gaps were above 11 at some point during the last three years (see Table 3).

[1] Simple average of CZ, HU and PL.

Sources: IMF, *International Financial Statistics*; national data; BIS credit to the non-financial sector, locational banking and property price statistics; authors' calculations.

<Figure 4-19> Total debt service ratio relative to critical threshold for Nepal

Notes: Total debt service ratio (%) of exports of goods, services plus primary income in Nepal. The green horizontal line denotes the critical value for the total debt service ratio. The blue horizontal line denotes the average except the banking crisis which happened in 1988.

Source: World Bank

<Figure 4-19> depicts the total debt service ratio (DSR, %) of exports of goods, services as well as primary income for Nepal. The black vertical line denotes the year 1988 when the banking crisis occurred in Nepal. The green horizontal line at value 11 indicates the critical threshold which is set for the total debt service ratio. The blue horizontal line at value 7.7 denotes the average value except the banking crisis which happened in Nepal in 1988. The critical threshold is usually set based on the past banking crises. However, since, historically, Nepal experienced only one banking crisis in 1988, we should set the empirical critical threshold using the unique 1988 banking crisis for Nepal. Notably, the total debt service ratio steadily increased since 1976 with some falling periods. It started to strongly increase about a couple of years before the 1988 banking crisis. Its historical peak was observed in 1989 at the value of 16 and after 1989 the total debt service ratio started to decline sharply. Since 2000, it appears to fluctuate between the values of 7 and 11. Thus, if we set the empirical critical threshold at the value of 11, the threshold detects only the unique banking crisis in 1988 and there are no false alarms. However, as we lower the threshold below 11, for instance, 10, there would be one genuine and accurate

prediction for the 1988 banking crisis but four false alarms after 2000. This indicates that lowering the critical threshold to 10 (which is below the empirical critical threshold of 11) gives rise to the 20% precision rate, which results in much more spurious signals than an actual crisis alarm.

Overall, among others, the total debt service ratio (DSR, %) of exports of goods, services plus primary income for Nepal could be used as an EWI to detect potential financial instabilities or vulnerabilities for the banking system as a whole. Other EWIs mentioned as above could be used as EWIs for Nepal, but it completely depends on data availability. It is crucial to detect possible financial instabilities or vulnerabilities in the banking system in real time since the ultimate purpose of macroprudential policy is to retain financial stabilities. Therefore, it is required to develop more useful EWIs besides the total debt service ratio (DSR) which are well specialized for the Nepal's economy. Developing proper EWIs for Nepal could help detecting possible financial instabilities or vulnerabilities in the banking system in advance and in turn, avoiding severe banking crises, which have an enduring and highly damaging effect on the Nepal's economy, by implementing timely macroprudential policy.

V. Challenges and opportunities in the financial system and a way forward after Covid19 in Nepal

1. Challenges and opportunities in the financial system of Nepal after Covid19

The Covid-19 pandemic and the containment measures taken to protect the public health triggered an unprecedented economic crisis in Nepal and globally. The pandemic and lockdowns thereby induced drove to around 1.99 percent contraction in the Nepalese economy in 2020 as estimated by the Central Bureau of Statistics (CBS). In terms of sector-wise performance, accommodation industry, transport and manufacturing were hard hit by the Covid-19 crisis. The accommodation industry contracted by 25.72 percent in 2020 compared to a growth of 9.92 percent in the previous year. Policy measures undertaken by the central bank of Nepal for stabilizing and reviving the economy helped in containing the impact of the virus on real and financial sectors of Nepal and safeguarding the overall macroeconomic stability in the short run.

The global crisis on one hand has shown our vulnerabilities while on the other hand highlighted our resilience. The post pandemic "normal" is expected to have some structural changes in the economy which will have its own merits and demerits. These structural changes in the economy post pandemic are expected to determine the shape and content of the new reality. The "new normal" will have implications on borrowers, financial investors, financial service providers and the regulators in myriad of ways. While some sectors of the economy are expecting a sudden rise owing to the pandemic others will have challenges multiplied. It is therefore necessary to examine the opportunities and challenges posed by the pandemic from different perspectives.

In the following section, the challenges and opportunities in the financial sector of Nepal post Covid-19 pandemic from different perspectives have been discussed.

A. Challenges

In addition to the health and human toll due to the pandemic, structural changes in the economy have posed serious challenges in the financial system of Nepal. The growing uncertainties amid the spread of the second wave are worrisome considering the continuity of the businesses and stability of the financial system. In addition, the pandemic induced changes like digitization, lack of official statistics, changing supervisory mechanisms, difficulty in technology adoption are some of the challenges that the financial system is expected to confront post pandemic.

(1) From the perspective of NRB

(a) Regulating the digital innovations

Innovative solutions and technological advancements are expected to transform the delivery of financial services by offering alternative ways of executing financial services post Covid-19. This change calls the central bank for crafting appropriate regulations to safeguard the interest of the consumers while fully nurturing the new developments that contribute to more inclusive and safe financial ecosystem thereby addressing the set of risks that both the users and providers are exposed to. Increasing reliance on technology and unregulated third-party providers throws operational risks; new payment systems and instruments could compromise market integrity and, ultimately, the monetary system; new products may be mis-sold to consumers who do not understand their risks or cannot afford to bear them; and the business opportunities created by new technologies may erode privacy and encourage unethical conduct.

Thus central bank should be equipped with regulatory measures for foreseeing the digital innovations. At the present context, NRB lags in policies to create and monitor infrastructures for digital services. Use of digital technologies to identify and verify customers without their physical presence for instance could be the new reform in demand. Similarly, protection of consumer data is another concern in which central bank needs to

intervene.

(b) Statistical darkness

Nepal Rastra Bank, as both producer and user of data has been challenged due to the impact of Covid-19 on official statistics. As the producer of data, official statistics became difficult to assemble owing to the disruption in the normal activities in the respondent sources. Although surveys could be conducted online, response rates fell making the identification of the underlying macroeconomic trend more difficult. The occurrence of the pandemic highlighted the need for reliable data to assess how badly the economy was hurt or to monitor the subsequent recovery and impact of policy responses. Yet central bank was confronted with a sudden disruption in official statistics as Covid-19 escalated. Many regular economic activities were shut due to the lockdowns imposed and the new activities that had replaced the old ones could not be immediately measured. While the speed and severity of crisis called for having reliable data in hand to evaluate the impact and give immediate response, statistical darkness is making it more difficult and uncertain.

(c) Changing supervisory priorities

Enhancing supervisory effectiveness is one of the key challenges especially after the fast paced change in the financial system post Covid-19. While manual monitoring of files that was the primary mechanism of supervision now calls for some innovation and use of technology, as on site visits have been restricted due to limited mobility, it is imperative that supervisors embrace new technology for market surveillance and micro and macro prudential oversight. Understanding how digitization affects policy and its implementation and seeking ways to monitor the digitized transactions should be of utmost priority in the times ahead. Therefore updating the macro prudential surveillance in line with the evolving nature of the business is a challenge faced by NRB after Covid-19.

(d) Exit management of Regulatory relaxation measures

Emergency actions taken by the NRB to mitigate the immediate impact of Covid-19 on Nepalese economy through unconventional fiscal, monetary and prudential measures have so far stabilized the economy. However, amid the crisis intensified due to the second wave of the virus, it is becoming particularly challenging for the central bank to analyze and anticipate the impacts of these regulations and the time frame for their gradual withdrawal from the financial system.

(e) Consumer protection

Along with ensuring the smooth and stable financial system, NRB is also concerned that the financial system serves the interests of the consumers and the wider economy. With the surge in digitization of financial services fueled by the pandemic, consumers of the financial services have been benefitted with many opportunities including hassle free transactions, online information campaign. However, digital economy is also a source of different challenges such as financial frauds, deceptive online marketing, and vulnerable group being excluded from the financial services to mention a few. Consumer protection amid accelerated shift to digital transactions is therefore a challenge to the Central Bank.

(f) Operational challenges

Changing nature of financial services demand changes in the supervisory and regulatory priorities of the central bank. With digitization surged, there arises the need to regulate the digital banking and also digitizing the regulatory activities. How well is the central bank equipped with the physical and human resources to evolve? A key challenge for NRB is how best to evolve its operations faced with rapid technological changes in the financial system.

(g) Inclusion in digital financial services

Covid-19 pandemic and the consequent surge in digital economy has multi fold impacts

on the central banks goal of financial inclusion. While the increase in digital banking in order to reduce the spread of the virus appears to have been creating new opportunities for the adoption of the digital financial services, the crises is also posing deep threat in the financial inclusion efforts of the country considering the portion of unbanked population who also do not have the access to digital services. Financial inclusion to the digitally constrained individuals is the main challenge amid the wave of digitized banking.

(h) Effectiveness of conventional monetary tools

NRB sets monetary targets so as to facilitate the economic growth, contain inflation and ensure financial stability. The fundamental monetary management is done to achieve the growth of broad money and private sector credit target. Conventional monetary tools have become less effective so that the central bank required using more unconventional tools to achieve the monetary target. In other words, there is need of blending unconventional tools such as refinance facility, concessional loan disbursement, rescheduling and restructuring of loan, regulatory relaxation to BFIs along with conventional monetary tools.

(2) From the perspective of financial (banks & etc.) sectors

(a) Management of Asset Quality

The regulatory relaxation provided by the central bank provided temporary relief to the borrowers. However, borrowers now have additional pressure to pay larger instalments covering the principal and interest amount in future. While the normal business activities were slowly recovering after the first wave of the virus, situation worsened with the second wave. The statistics regarding NPL however is not as alarming as it was expected. NPL to total loans ratio that stood around 1.74 percent in the pre Covid-19   phase reached 1.50 percent on May 2021. Nevertheless, it is to be noted that these indicators do not reflect the true quality of the assets in the banking sectors as the regulatory relief

packages provided by the central bank has hidden the true scenario of the bank assets. Amid uncertainties brought by the second wave of the pandemic, management of the asset quality appears to the burning issue in the financial system of Nepal post Covid-19.

(b) Profitability

Commercial banks witnessed a drop in their profits due to the impacts of Covid-19 on the economy. Net profits of the BFIs declined by 20.62 percent in the mid July 2020 as compared to the previous year. Due to lockdowns imposed to contain the spread of the virus, all the major economic activities stopped thereby making businesses unable to fulfill their financial obligations. With no new loans to be disbursed coupled with difficulty in recovering the principal and installments of the loans banks profit plummeted like never before. Amid the struggle to recover from the first wave, the second wave worsened the situation adding uncertainties to the situation. Maintaining the profitability of the business among these uncertainties is the main challenge being faced by the financial system of Nepal.

(c) Risk Management

While the severity of the risks of the substandard assets and credit growth is still unknown owing to the uncertainties of the duration of the crisis, financial institutions are confronted with a multitude of other risks. The initial economic losses due to the pandemic will take time to materialize as they are now hidden under the regulatory relaxations. However, regulatory relaxations mean accepting higher levels of risks for a period of time that in not certain. Existing credit risk frameworks is insufficient to measure and manage credit risk under severe stress condition created by the pandemic. As financial services move into the new era of technology adoption, risk management practices too need to evolve to address to the changing risk environment.

(d) Changing nature of financial services (cost and workforce implications)

Technological change is disrupting the landscape of financial services. Competitive environment is changing with new business models, trends of investments in developing the necessary capabilities to evolve businesses. On one hand these changes have called for increasing need of outsourcing technical services, while on the other customers expectations regarding the new modes of financial services have changed. This change is expected to change the traditional financial services for better, more effective and smarter ways. However, these changes might have implications on the cost structure of the business, workforce management and operational issues as well. Therefore, financial service providers are challenged with making the appropriate choice about adoption of new technology and understanding the risks associated with them.

(e) Cyber risks/ Data Confidentiality

Covid-19 has sparked a move to digitization. Financial institutions have temporarily shifted to remote working to protect their workers. Digital transactions have been encouraged for the safety of the customers as well as employees. Confidential meetings are now being conducted through video conferencing tools.   Moving the majority of activities to the digital world has increased the risk of cyber attacks. As staff work from home through private devices possibly used by multiple members of the household logging on the same network, potentially exposing devices to malware that could intrude the firm's environment, risks of data confidentiality arise. Also the security standards of some of the software used for video conferencing are found to be sub optimal thereby exposing financial institutions to a serious cyber risks.

(f) Continuity of business

BFIs' staff infected from the pandemic increased from first wave to second wave that is why they need to cautiously mobilize their human resources but not to shut their business completely as bank and financial services is the urgent category of business. The regulatory requirement also does not allow BFIs to completely shut their physical services

even though the emphasis was given for online virtual transaction, use of cashless instruments etc. Continuing business by providing basic and urgent services to their customers is the challenge to BFIs in pandemic.

(3) From the perspective of depositors (or financial investors)

(a) Persistently low interest rates

Interest rates declined significantly due to the Covid-19 crisis as the initiatives taken by the central bank to maintain enough liquidity in the market while investment opportunities in the markets remained low. Average deposit rate has declined from 6.80 percent in Dec 2019 to 4.81 in May 2021. Thus financial investors are faced with the challenge of low returns and lack of appropriate investment alternatives.

(b) Difficulty in Technology adoption

Adoption of the new technology both by the financial service providers and other business companies pose challenges especially to those depositors who do not have access to digital platforms for transactions. As per the latest MIS report from Nepal Telecommunication Authority (Falgun 2077) broadband Internet penetration has reached 89.17% in Nepal which means still around 11 percent of the population is digitally excluded.

(4) From the perspective of borrowers (or business entities)

(a) Downfall in demand

According to CBS Nepal, Covid-19 crisis seriously affected economic activities in Nepal resulting in the contraction of the economy by 1.99 percent in 2020. In terms of sector-wise performance, accommodation industry, transport and manufacturing were hard hit by the Covid-19 crisis. The accommodation industry contracted by in 2020

compared to a growth of 9.92 percent in the previous year. Thus a massive downfall in demand is being witnessed by the businesses especially of the sectors hard hit by the pandemic and thus their revival is a challenge.

(b) Cash flow constraints

Business owners are faced with serious cash flow constraints due to the pandemic. With merchandises stored and locked in the inventory for several months, majority of them losing their value businesses face losses. Companies are definitely having a tough time in recovery of debtors, payment to suppliers and employees, servicing of banks interests, payments of rents. In many businesses, these constraints are so severe that the businesses have opted for complete closure of the business while few in partial operation too have difficulties continuing through the second wave.

(c) Supply chain disruptions

Most of the business's supply chains are under severe stress due to the pandemic. Issues from procurement of raw materials, their transportation to the manufacturing facility, production and delivery have been adversely affected by the pandemic.

(d) Difficulty in Technology adoption

While the pandemic has forced businesses to move towards digitization, it is to be noted that many small businesses are struggling to adapt with the changing technology in different business activities. Digitizing banking transactions is just a tiny bit as compared to digitizing whole of their operations from order placement to delivery as it has workforce and cost implications.

B. Opportunities

While the pandemic induced structural changes largely poses challenges to the economy as discussed in the earlier section, it is also expected to have some beneficial

impacts on the financial system and economy. The pandemic induced acceleration in digitization, rearrangements in work habits, demand for technology, burst of technological adoption are expected to transform the ways of doing business not only in the financial sector but in the economy overall. However, there is the urgency to implement reforms both in policy and operational levels in the pursuit of these opportunities.

(1) Digital Banking

The silver lining of the pandemic is the surge of digital banking in Nepal. Limited mobility due to lockdowns and restrictions has motivated both the users and providers of the financial system to step up towards digital banking services like mobile banking, internet banking, card payments. On one hand, spread of the virus is making the need for digital transactions more urgent, while on the other, customers' growing reference towards digital services is intensified than ever. This situation could be a catalyst in Nepal's lap towards digitization of financial services. Both financial service providers and the regulator can capitalize the current situation for more investment in fintech thereby evolving the traditional way of banking in Nepal.

(2) Improving financial inclusion through digital channels

Due to lockdowns many bank branches in the country were forced to close down. As a result, high number of customers remained underserved and many with no ATM cards or digital banking facility felt totally excluded from the banking services. This exclusion led to people discovering the benefits of digital banking and exploring different financial apps that they would have shied away from only a few months earlier. With initiatives like online account opening, online KYC, and mobile loan facilities, there is a greater potentiality for the unbanked population to leapfrog directly to embrace mobile banking and financial services. However, it is crucial to ensure that the digitally constrained

population is also able to benefit from these initiatives.

(3) Efficient Working Ways (Speed and Innovation)

Pre-crisis, the banking world had a general perception that remote working would lead to lower productivity. With majority of bank employees working from home during lockdowns, these strongly held notions have been put to test. Surge of digitization is sure to curb a lot of manual works from the bank staffs resulting in greater time savings. Also virtual meetings and customer engagements imply positive cost implications. Flexibility in work timings have been allowed as tasks can be completed from the remote work station mainly from home.

(4) Partnerships with Fintechs and other businesses

The current uncertainty has placed businesses everywhere under economic stress. However, the fintech sector, given their differentiated capability is well positioned to not only survive the crisis but also contribute to the financial system in more meaningful and sustainable ways. An important outcome of the pandemic could be the development of partnerships among financial institutions and fintech companies for creative solutions towards digitization of financial services.

(5) Environmental Awareness/ Sustainable projects

In the wake of the pandemic, citizens around the world are more concerned about addressing the environmental challenges and are more committed to changing their own behavior towards sustainable consumption. This heightened awareness has major implications for both businesses and government including the financial system. Businesses as a result of this awareness among the consumers will have to integrate environmental concerns to their products and services to a greater extent. This ultimately

demands for the commitment towards sustainable projects across all sectors of the economy.

(6) Building resilient financial system

The pandemic has made the need to promote resilient banking more evident than ever. Resilient banking is the one that can continue to function in the face of disruptions and movement restrictions. Banking industry in Nepal has felt massive effects from the crisis in terms of asset management, liquidity management, and profitability with more to come in the days ahead. However, banks have been effectively supporting the economic recovery so far. How effective a bank supported economic recovery will be will depend on the further spread of the virus and government measures to mitigate them. Nevertheless, the realization that building banks capital is not optional but a requirement can be a basis for future steps towards developing more resilient banking systems.

2. Global best practices for financial stability after COVID-19

A. Introduction

COVID-19 global pandemic was an unanticipated shock to economies around the globe. Global economic downturn was inevitable starting from early 2020 and thereafter the financial instability was pronounced until now. Despite the intense situations from the pandemic, the policy responses across countries, whether developed or developing, were quite similar and synchronous, as COVID-19 shock was global and fairly synchronous across regions and across sectors. It would be still early to make a thorough assessment on the effectiveness of policy responses since the pandemic is still ongoing, but it is important to identify what kind of policies, especially focusing on financial stability measures, were adopted around the globe and examine whether they were relevant to cope with the unanticipated shock. This kind of rough sketch would still be helpful in terms of

understanding and designing policy measures confronting unanticipated shocks and guaranteeing the financial market soundness. As Carl Benedikt Frey said in his book, *The Technology Trap: Capital, Labor, and Power in the Age of Automation*, "Prophets may be able to foretell the future; economists cannot. The objective here is to provide perspective, and perspective we get from history". Hence, the section is devoted to summarizing the global experiences from the perspective of policy makers who are mostly concerned with financial stability. This kind of preliminary understanding will hopefully give some hints to Nepalese policy makers.

B. Global Policy Responses to COVID-19 Pandemic

The policy responses of many governments to COVID-19 shock were implemented in various form and in a timely manner. Though hard to track down the exact number of all the policy responses around the world, Yale Program on Financial Stability 2020 Financial Intervention Tracker shows roughly how many announcements were made regarding financial stability policies in response to COVID-19. As shown below, roughly speaking, 40% of policy announcements are macroprudential policy measures. Also, the policy announcements were mostly concentrated in the early stage of COVID-19 pandemic as the number of announcements has reached in March of 2020 while many policy announcements followed persistently afterwards during the year of 2020.

<Figure 5-1> Share of Policy Announcements

■ Monetary Policy   ■ Fiscal Policy   ■ Macroprudential Policy   ■ Emergency Liquidity

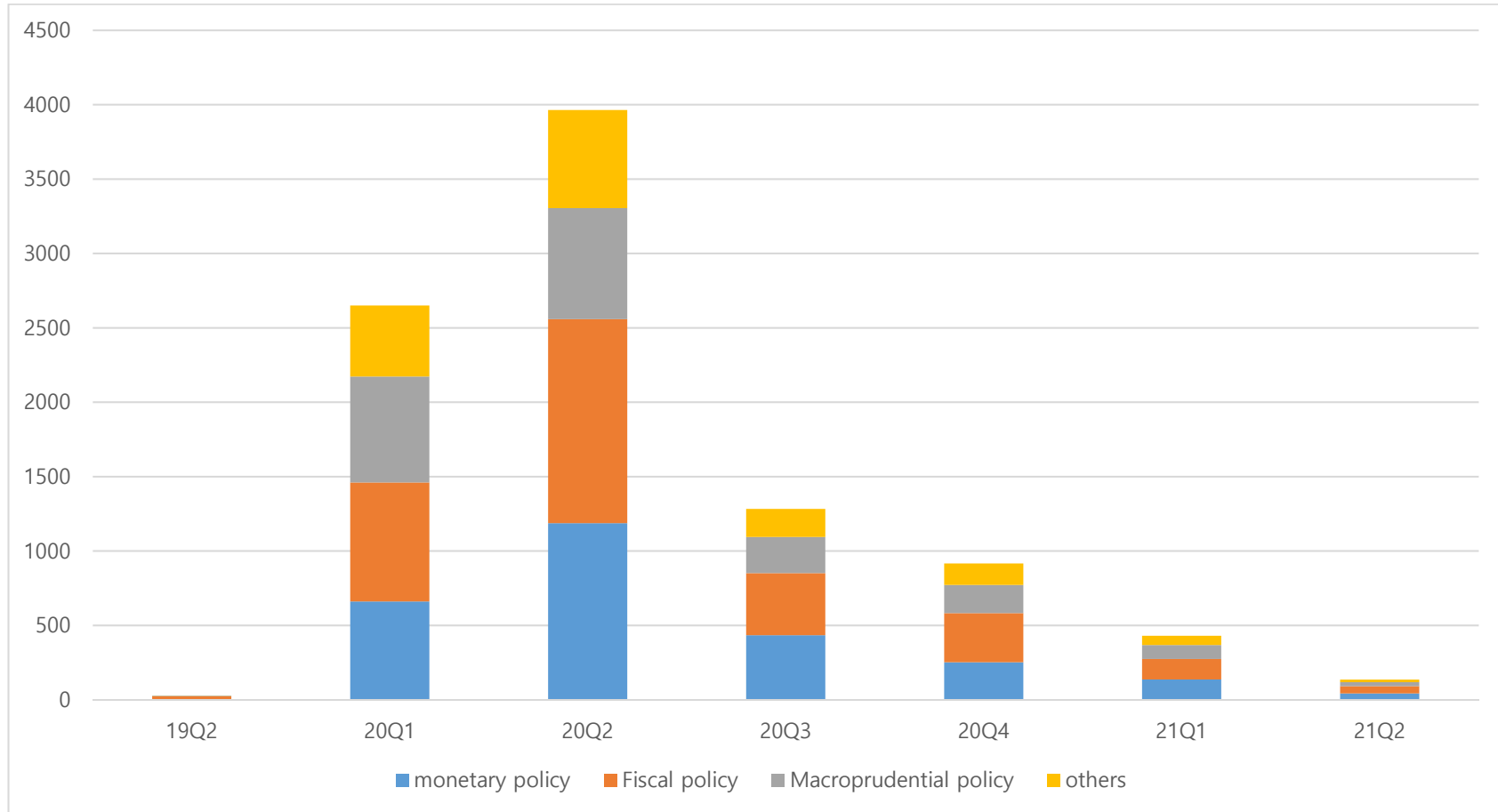Source : Benedikdottir, et al. (2020)

As shown below, both the number and share of policy announcements across countries also vary. As of Sep 2, 2020, U.S.A has by far largest number of policy announcements with macroprudential policy measures constituting the largest share. Korea follows next to U.S. in terms of number of policy interventions. The share of policy measures for Korea also shows macroprudential policy is the most frequent approach similar to U.S.. While many countries' primary share of policy announcements was associated with macroprudential policy measures, though the number of announcements varies, there are some countries who use the fiscal stimulus as a primary tool to cope with the economic contraction. Those countries are, most notably, Argentina, Israel, Indonesia, Hong Kong and some European countries including European Union.

Since the economic activities were instantaneously and drastically plummeted due to COVID-19 crisis, traditional macroeconomic policies such as fiscal policy and monetary policy immediately responded to counter the economic downturn. In case of Korea, a first fiscal stimulus payment was administered in April 2020 which was at the early stage of COVID-19 pandemic. Since then, two additional fiscal stimulus payments were implemented and now a fourth fiscal stimulus is under consideration as of July 2021. This fiscal policy measure is mostly aimed to compensate for underperforming consumption

of households due to slowdown of face to face businesses. In addition to fiscal policy, the RP 7 days rate which is the policy rate of Bank of Korea was declined by almost 0.75%p from 1.25% in six months and have been maintaining for more than a year now. Those two convention policy responses were quite obvious and expected to react to the economic contraction due to COVID-19.

What brought more attentions to the policy circle was regarding financial stability measures since the experience of the global financial crisis in 2008 has made the policy makers realize how the financial instability can amplify the adverse shock and undermine the macroeconomic fundamentals. The above evidence on share of policy announcements speaks for itself not only the importance of the macroprudential policy measures but also there are many forms of macroprudential policy measures in contrast to two conventional macroeconomic policies.

<Figure 5-2> Policy Interventions since COVID-19

Source: Based on author's calculation from Yale Program on Financial Stability as of Q2, 2021

<Figure 5-3> Policy Interventions by Country and Type

Source: Yale Program on Financial Stability as of Sep 2, 2020

C. Macroprudential Policy Measures

Since financial markets have been sophisticated as the global economy has been growing rapidly, diverse approaches regarding macroprudential policy measures are introduced. In addition, the rare events like the global financial crisis in 2008 have contributed to complicating the macroprudential policies even more. Although it is difficult to strictly distinguish what types of macroprudential policies are available since there are still some evolving areas in terms of policy development, it is useful to roughly categorize the macroprudential policy approaches in order to make a pertinent assessment and to derive policy implications for future.

Macroprudential policy is supposedly designed to accommodate the adverse shock that may generate a systematic risk in the financial market and result in macroeconomic consequences. Hence, the macroprudential policy is not only about how to respond to the adverse shock such as COVID-19 pandemic but also about providing an ex-ante macroprudential policy space. We will first take a glance at the various approaches implemented during COVID-19 pandemic crisis and later discuss some of key determinants to establish the macroprudential policy space that made such policy measures available once the adverse shock is emerged.

First type of macroprudential policy is using the capital buffers of commercial banks. Relaxation on capital buffers was the most common macroprudential measure among the national authorities during COVID-19 crisis. Basel III capital reform introduced three types of capital buffer, namely, minimum capital requirement, capital conservation buffer(CCoB) and countercyclical capital buffer(CCyB). Basel III capital reform provides three layers of capital buffers in which banks can build up in the time of economic expansion and ease in the time of economic recession. This kind of framework basically controls the excess supply of credit in the good times by tightening the capital buffers while confronts the credit supply shortage by relaxing the capital buffers.

As can be seen in the below table of ECB Banking Supervision, most European countries lowered the countercyclical capital buffer(CCyB) to 0% while the capital

conservation buffer(CCoB) is maintained at the initial level, 2.5%. Also, as Nier and Olafsson(2020) has shown in their table, many other countries including Nepal have relaxed the countercyclical capital buffer to ensure the enough credit supply flow in response to COVID-19 crisis. Some European countries have other additional capital buffers known as systematic risk buffer which was also lowered..
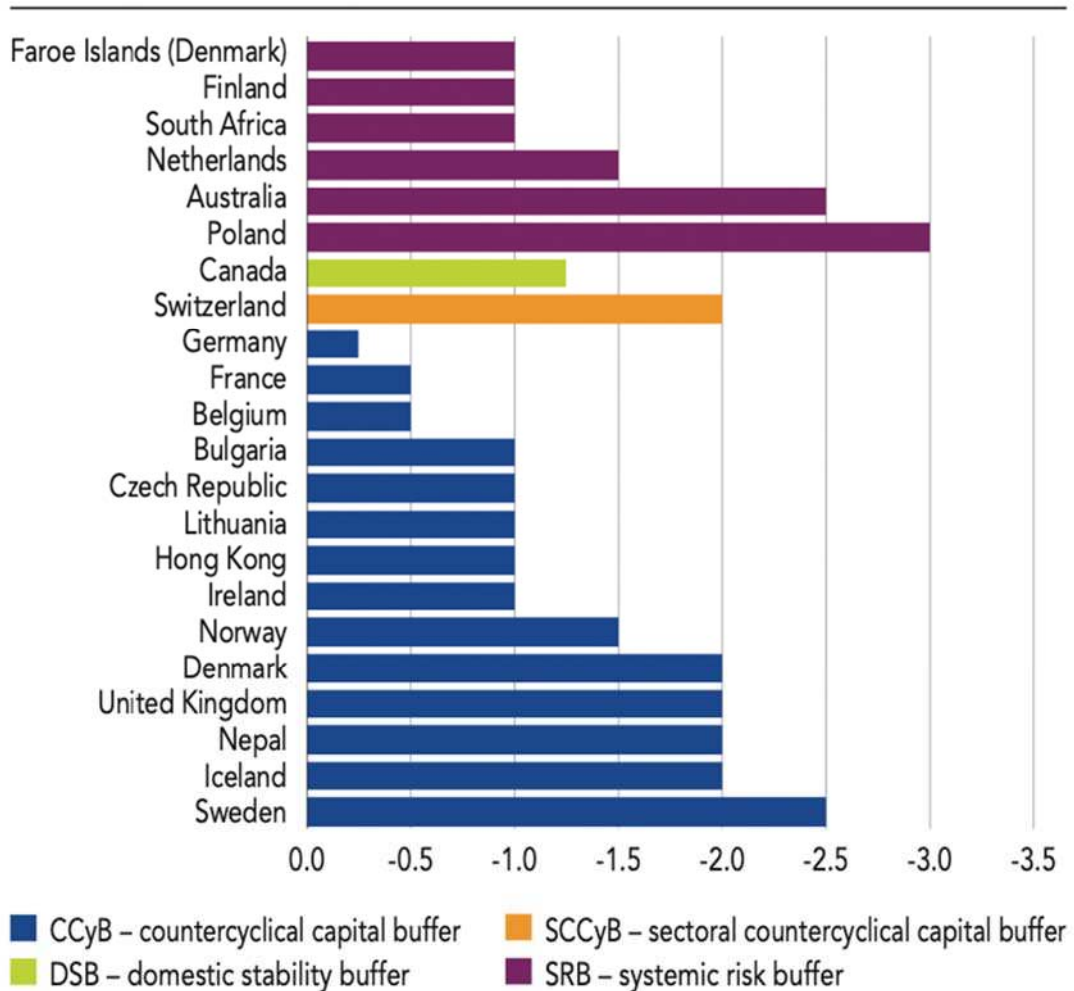
\<Table 5-1\> Capital Buffers ratios in Europe

Country	Decision-making authority	CCoB	CCyB	Combined buffer requirement
Austria	Finanzmarktaufsicht	2.5%	0%	2.5% ~ 4.5%
Belgium	National Bank of Belgium	2.5%	0%	2.5% ~ 4%
Bulgaria	Bulgarian National Bank	2.5%	0.5%	6% ~ 7%
Croatia	Hrvatska narodna banka	2.5%	0%	4% ~ 6%
Cyprus	Central Bank of Cyprus	2.5%	0%	2.5% ~ 3.5%
Estonia	Eesti Pank	**2.5%**	0%	2.5% ~ 4.5%
Finland	Finanssivalvonta / Finansinspektionen	**2.5%**	0%	2.5% ~ 4.5%
France	Autorité de Contrôle Prudentiel et de Résolution Haut Conseil de Stabilité Financière	2.5%	0%	2.5% ~ 4%
Germany	Bundesanstalt für Finanzdienstleistungsaufsicht	2.5%	0%	2.5% ~ 4.5%
Greece	Bank of Greece	2.5%	0%	2.5% ~ 3%
Iceland	Central Bank of Ireland	2.5%	0%	2.5% ~ 3.5%
Italy	Banca d'Italia	**2.5%**	0%	2.5% ~ 3.5%
Latvia	Financial and Capital Market Commission	**2.5%**	0%	2.5% ~ 4.5%
Lithuania	Lietuvos bankas	**2.5%**	0%	2.5% ~ 4.5%
Luxembourg	Commission de Surveillance du Secteur Financier	**2.5%**	0.5%	3% ~ 4%
Malta	Bank Centerali ta' Malta	**2.5%**	0%	2.5% ~ 4.5%
Netherlands	De Nederlandsche Bank	2.5%	0%	2.5% ~ 5%
Portugal	Banco de Portugal	**2.5%**	0%	2.5% ~ 3.25%
Slovakia	Národná banka Slovenska	**2.5%**	1%	3.5% ~ 5.5%
Slovenia	Banka Slovenije	2.5%	0%	2.5% ~ 3.5%
Spain	Banco de España	2.5%	0%	2.5% ~ 3.5%

Source: ECB Banking Supervision, as of April 7 2021

<Figure 5-4> Relaxation of Macroprudential Capital Buffers (%p)

CCyB – countercyclical capital buffer
SCCyB – sectoral countercyclical capital buffer
DSB – domestic stability buffer
SRB – systemic risk buffer

Source : Nier and Olafsson(2020)

Other than releasing the discretionary capital buffers such as countercyclical capital buffer and systematic risk buffer, some central banks or financial regulators are advising banks to hold shareholders distributions or employee bonuses. Freezing dividends may be controversial as Former Fed Governor Jeremy Stein has strongly expressed objection. However, Basel III requirements automatically reduce banks' payouts once banks reach conservation buffer and thus banks are encouraged by authorities to preemptively secure capital buffer by holding dividends and bonuses.

While relaxing capital buffers is a supply-based macroprudential policy tool as IMF[22] has categorized, a demand-based macroprudential policy tool such as relaxing the borrowers' constraints have been encouraged by national authorities as well. For example, borrowers with delinquency in payments due to COVID-19 crisis are not required to be downgraded. Some authority like Bank of England is asking banks to evaluate the borrowers' risks with more flexibility by taking into account government relief measures. In sum, those guidance regarding the borrowers' classification can be considered as easing the approach to nonperforming loans.
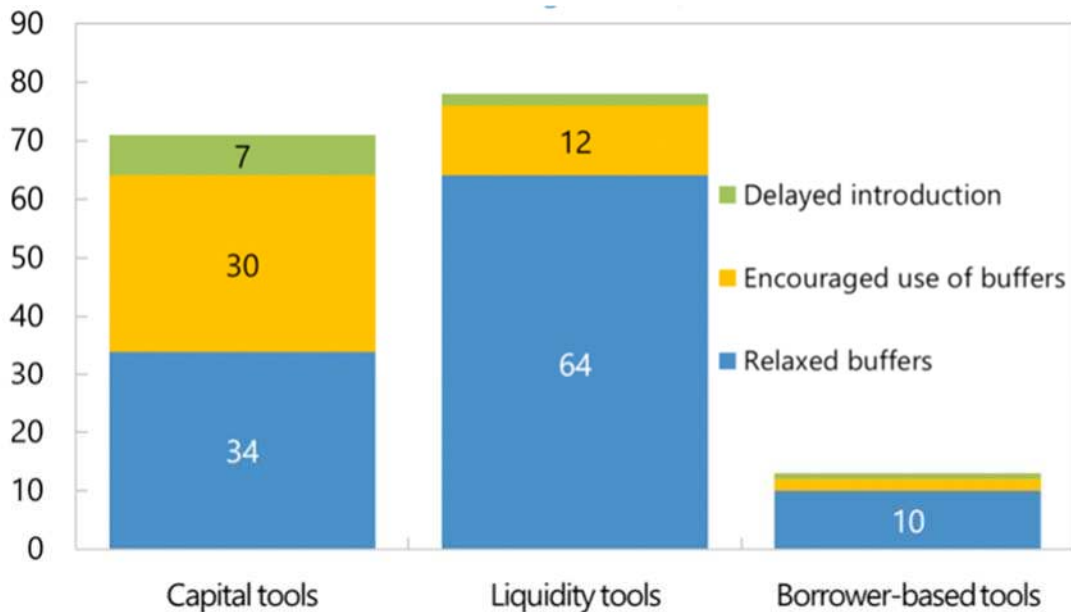
Another important macroprudential policy measure is using the liquidity buffers. Most representative measure for the liquidity buffer is the liquidity coverage ratios(LCRs), the ratio of high-quality liquid assets to short-term liabilities. Most authorities such as ECB allowed banks to operate temporarily below Basel III requirement in terms of the liquidity ratios. The Fed said to use the liquidity buffers to "lend and undertake other supportive actions in a safe and sound manner." While most of authorities leave financial institutes to their own discretions as to how much they can use the liquidity buffers, South Africa and Korea are exceptions since they have explicitly provided precise guidance to the LCRs. South Africa's central bank lowered the liquidity coverage ratio to 80% from 100%. And the Bank of Korea has eased foreign exchange liquidity coverage ratio from 80% to 70%. In addition to easing the liquidity coverage ratios, some authorities are relaxing reserve requirements which can be considered, broadly speaking, as macroprudential policy in the time of economic crisis. Fed has lowered its reserve requirements to zero, and the Reserve Bank of India lowered its cash reserve ration from 4% to 3%.

Lastly, there have some policy measures to relieve the costs of compliances to financial institutions. ECB and Bank of England delayed 2020 stress tests, and the Fed temporarily reduced exam activities and postponed reporting deadlines. Those measures can also be considered as macroprudential policy tools since they augment the operational capacity of financial institutions in responding to the immediate needs due to COVID-19 crisis.

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[22] Global Financial Stability Report, IMF, April 2021

<Figure 5-5> Relaxation of Macroprudential Policy Tools
(Number of countries, Aug 2020)

1. Liquidity tools include reserve requirements. For borrower-based tools: blue, yellow and green reflect a relaxation of LTV, D(S)TI, and other tools, respectively.
Sources: IMF Policy Tracker, IMF Financial Regulatory Measures database, staff calculations.

Source : Nier and Olafsson(2020)

Overall, there are many countries easing mainly capital buffers and liquidity buffers as Nier and Olafsson(2020) figure shows above. Macroprudential policy measures illustrated above seem to have been implemented in timely manner and in various ways to offset the adverse impact of COVID-19 pandemic crisis. Also, considering the moderate soundness of financial stability in both developed and developing countries in contrast to the global financial crisis in 2008, the global financial system, partially thanks to Basel III, has established more resilience relative to the past financial crisis. Consequently, it would be important to identify what factors may have made these effective policy responses possible in the first place.

D. Establishing Macroprudential Policy Space

In order to implement various macroprudential policy measures in the time of needs, it

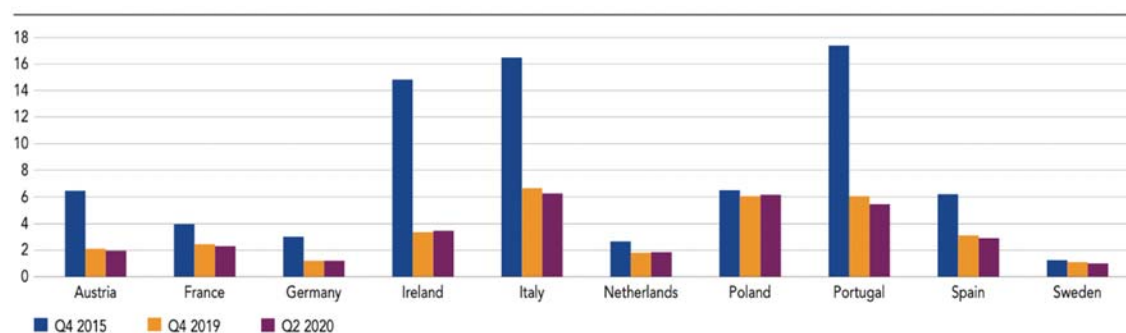is crucial to establish a macroprudential policy space. Prior to COVID-19 pandemic crisis, the banking sectors in the most of countries seem to have been building up the macroprudential policy space in both credit supply and demand. The first of below figures from Buch et al. (2021) demonstrates that most of developed countries have been accumulating the capital ratios during the last decade. Bank capital ratios have grown up to approximately 15% creating the policy space in terms of credit supply. With COVID-19 crisis, these regulatory capital buffers have been eased as discussed above to absorb unanticipated systematic risks in the financial markets. The second figure from Buch et al. (2021) shows declining trends of the non-performing loan ratio in those countries over the past decade. This also reflects that the financial market instability has been reducing on the credit demand side establishing the borrower-based policy space as well.

<Figure 5-6> Bank Capital Ratios, selected economies
(Regulatory Tier 1 ratio, % of risk weighted assets)

Source : Buch et al. (2021)

<Figure 5-7> Non-performing loan ratio, selected economies
(% of total gross loans and advances)
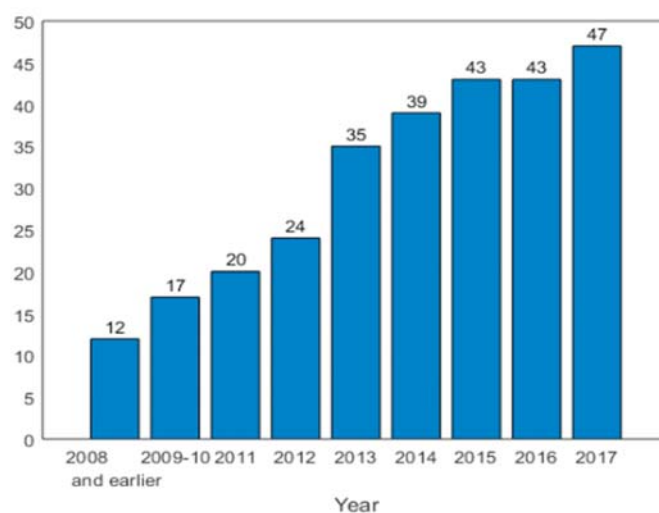

Source : Buch et al. (2021)

The building up the macroprudential policy space was common across the countries before COVID-19 crisis. This is probably due to the hard lesson the global community has learned from the experience of the global financial crisis in 2008 in which the financial instability was the main reason for the economic crisis. Basel III framework was established based on this experience which seems to have helped to shape the current macroprudential policy. Besides the Basel III requirements, some of national authorities have encouraged the banks to build up more additional buffers. While the Basel III framework has improved to establish the macroprudential policy space in general, a discretionary macroprudential policy space may be formed depending on the circumstances.

Establishing macroprudential policy space often involves a resolution of national authority. Macroprudential policy space can only be established preemptively by nature. It is a preemptive policy in a sense that banks should be building up capital and liquidity buffers in good times by missing many profitable opportunities. This is costly from banks point of view, while this preemptive measure can only benefit in bad times by minimizing the systematic risk from adverse shocks. Moreover, the macroprudential policy can have distributional effects unlike traditional monetary policy. Consequently, a preemptive establishment of macroprudential policy space often involves not only technical expertise but also some political considerations.

Edge and Liang (2020) have argued a formation of financial stability committee is important to coordinate the macroprudential policy which should be forward-looking and preemptive. And its scope of authority on policy actions and accountability should be clear in order to implement macroprudential policy more easily. This implies that a strong governance of the financial stability committee helps to establish the macroprudential space when the financial institutions are reluctant to comply with tightening policy measures in good times. As shown in <Figure 5-8>, out of 58 countries that are in dataset of Edge and Liang (2020), 47 countries have formed the financial stability committees as of 2017, which number has kept rising since the global financial crisis. The financial stability governance, however, varies in terms of their accountability and initiatives for

policy actions. Edge and Liang (2020) identified the strength of the financial stability committee governance as legislative establishment, existence of voting process, existence of designated chair and the scope of macroprudential policy tools such as CCyB and LTV ratios. Moreover, the smaller number of government agencies involved in forming the financial stability committee more likely implement the macroprudential policy measures like CCyB preemptively since the coordination problem is reduced. In sum, the macroprudential policy space can be augmented with the strong governance of the financial stability

<Figure 5-8> Number of Financial Stability Committees, by year of Formation

Source : Edge and Liang(2020)

E. Upcoming Challenges to Emerging Market Economies after COVID-19

COVID-19 pandemic shock, though unexpected and drastic, was fairly synchronous and symmetric across the countries and sectors. Consequently, the policy responses were quite synchronous across countries. However, the speed of economic recovery across countries and regions is expected to diverge depending on the magnitude of the COVID-19 infected cases, financial market soundness, the livelihood of economic activities, face to face business concentrations, inflation pressure and remaining macroprudential policy space. Once the developed economies, especially those who have overcome COVID-19

adverse shock with early vaccinations, start to recover, tightening policy measures of monetary policy and macroprudential policy will likely take place sooner or later. This implies financial disruptions particularly concentrated in emerging market economies. Hence, for emerging market economy like Nepal, it is crucial to monitor not only domestic credit flow but also international capital inflow and outflow since it is a small open economy which is susceptible of sudden capital outflow. While the domestic credit in Nepal has been relatively stabilized so far thanks to preemptive macroprudential policy measures and limited appreciation of U.S. dollars, the instability along the path of economic recovery may rise through the financial channel of foreign currencies.

Motivated from the similar perception, Avdjiev et al. (2021) has examined the vulnerability of international bank lending in emerging market economies. They have found that the short-term foreign liability was not the main factor causing the contraction in the international banking lending during COVID-19 crisis but US dollar exchange rate was the key determinant for the international banking lending. Exchange rate fluctuation in principle would cause a potential mismatch in terms of valuation on the balance sheets. But the Federal Reserve has provided dollar liquidity swap lines with several countries to prevent U.S dollar from steep appreciation that may cause the contraction in the international banking lending. Nevertheless, this policy will not permanent and eventually switched back to the normal state.

Hofmann and Park (2020) and Avdjiev et al. (2019) both find that the financial channel of exchange rates have an impact not only on international banking lending but also on real activities including GDP and real investment. Therefore, the upcoming challenges for the emerging market economies is the financial channel of exchange rate, the financial authority should focus on monitoring both international lending and foreign exchange market. To monitor the policy space in this avenue, the short-term foreign liability relative to foreign currency liquidity buffers of banking sector deserves an attention along with the foreign reserve of the central bank.

VI. Conclusions

Although Nepal economy is one of the hardest hit economy by Covid19 crisis with her high dependency on 'high-contact industries', the financial stability in Nepal has been relatively well managed without significant increase of the non-performing loans or other disturbing signals in the financial markets. Nevertheless, while the Covid19 crisis is still ongoing with very high uncertainty, this KPP project tried to identify the optimal policy path for the financial stability in Nepal after identifying the structural features of the Covid19 crisis and the impacts on Nepal economy and financial markets.

Covid19 crisis, which is characterized as a simultaneous physical disconnection of the supply and demand chains, mainly damages the high-contact industries and economies that are heavily dependent on high-contact industries. In that context, the Nepal economy was supposed to suffer unprecedented turbulences due to Covid19 shocks. Surprisingly, the general macroeconomic performances of the Nepal economy and the financial market situations in Nepal have shown relatively stable trends in comparison to other less developed economies, mainly due to the active relief policies in reducing financial burdens by damaged industries and households.

Although the possible liquidity crisis has been well prevented in Nepal till now, the real challenges are from now on, especially, if the postponed liquidity crisis is transformed to a realized insolvency crisis due to delayed economic recovery and sustained malfunctioning economic development policies. The general signals from the latest financial data that the financial stability in Nepal is well managed in terms of relatively limited scale of non-performing loans, and the slight increase of households' saving rate are only necessary conditions for short-term financial market stability, and should not be interpreted as the sufficient conditions for long-term financial stability in Nepal.

The driving and sufficient condition for the long-term financial market stability is the market confidence on the potentials for the sustainable economic growth and development in Nepal signaled by consistent developmental policy actions

complemented by actual data of increasing investment in the prospective high-valued added sectors in the Nepal economy. This implies that the real financial market stability can be achieved only when the financial stability policies are integrated to the consistent economic growth and development policies of Nepal.

In this context, it is recommended that to make further efforts to exactly identify where the Nepal economy and financial market systems are located in the dynamic path to recover from Covid19 crisis. For most advanced economies and several emerging market economies, more strict macroprudential policies are recommended to prevent the possible asset bubble formation and the related financial market instability due to the possible collapse of asset bubbles. However, the optimal macroprudential policy toolkit for Nepal should be reexamined mainly considering the difference of the structural and dynamic stage of Nepal economy in her recovery path from Covid19 crisis.

In case the financial stability policy decision making mechanism is integrated to the consistent economic developmental policy decision making processes in Nepal government's efforts to recover from Covid19 crisis, the challenges posed by the Covid19 crisis might be transformed to new chances for the Nepal economy and the financial stability in Nepal. The preconditions for the new chances would be the rigorous economic analysis for the strength and the weakness for the potential economic growth and developmental path in Nepal, and the realistic estimation of the available resources including economic and capital resources in addition to political and international recourses.

Appendix

Annual Growth Rate of GDP by Economic Activities
(at constant prices)

(Unit : %)

	Industrial Classification	Composition	2073/74	2074/75	2075/76	2076/77 R	2077/78 P
			2016/17	2017/18	2018/19	2019/20	2020/21
A	Agriculture, forestry and fishing	25.83	5.17	2.61	5.16	2.23	2.64
B	Mining and quarrying	0.58	14.60	9.40	17.62	-2.23	7.49
C	Manufacturing	5.08	16.83	9.21	6.52	-8.57	3.85
D	Electricity, gas, steam and air conditioning supply	1.23	22.84	10.38	9.61	25.58	7.74
E	Water supply; sewerage, waste management and remediation activities	0.55	3.03	4.57	1.22	2.15	1.61
F	Construction	5.68	18.68	12.10	7.48	-4.99	5.56
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	15.67	10.71	17.23	8.11	-10.69	5.27
H	Transportation and storage	5.43	4.41	11.68	8.77	-13.37	6.12
I	Accommodation and food service activities	1.56	13.39	12.21	9.92	-36.97	11.20
J	Information and communication	2.17	13.65	2.14	7.05	2.30	1.45
K	Financial and insurance activities	6.88	9.80	9.43	6.35	4.75	5.82
L	Real estate activities	9.43	4.05	1.56	3.75	2.37	2.64
M	Professional, scientific and technical activities	1.06	8.71	4.95	5.61	1.20	2.32
N	Administrative and support service activities	0.76	16.28	18.62	6.44	2.15	2.17

O	Public administration and defence; compulsory social security	7.70	8.03	4.71	5.12	5.98	3.49
P	Education	8.05	7.21	5.83	5.98	3.20	3.60
Q	Human health and social work activities	1.73	7.40	5.87	6.69	5.20	6.53
R, S, T, U	Arts, entertainment and recreation; Other service activities; and Activities of households as employers; undifferentiated goods- and services- producing activities of households for own use	0.61	4.69	4.63	5.92	1.77	3.09
	Agriculture, Forestry and Fishing	25.83	5.17	2.61	5.16	2.23	2.64
	Non-Agriculture	74.17	10.18	9.50	6.90	-3.91	4.57
	Gross Domestic Product (GDP) at basic prices		*8.59*	*7.37*	*6.39*	*-2.12*	*3.98*
	Taxes less subsidies on products		12.86	10.02	9.20	-1.82	4.24
	Gross Domestic Product (GDP)		*8.98*	*7.62*	*6.66*	*-2.09*	*4.01*

R = Revised/P = Preliminary

April 30, 2021

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